

Unit 1: Whole Numbers and Operations

Learning Check 1.1

1. Place commas in the following numbers.

- a) 1634505 Answer: 1,634,505 b) 8984855 Answer: 8,984,855
c) 3251651 Answer: 3,251,651 d) 9859851 Answer: 9,859,851
e) 2892684 Answer: 2,892,684 f) 4049074 Answer: 4,049,074

2. Write the value of the coloured digit in each of these numbers.

- a) 6,112,112 = $2 \times 1000 = 2000$
b) 1,009,409 = $1 \times 1,000,000 = 1,000,000$
c) 7,345,911 = $3 \times 100,000 = 3,000,000$
d) 9,413,327 = $2 \times 10 = 20$
e) 8,444,666 = $8 \times 1,000,000 = 8,000,000$
f) 3,221,988 = $2 \times 10,000 = 20,000$

3. Write the given numbers in words.

- a) 3,425,527

Answer: Three million, four hundred and twenty-five thousand, five hundred and twenty-seven.

- b) 8,376,687

Answer: Eight million, three hundred and seventy-six thousand, six hundred and eighty seven.

- c) 1,888,008

Answer: One million, eight hundred and eighty-eight thousand and eight.

- d) 6,555,326

Answer: Six million, five hundred and fifty-five thousand, three hundred and twenty-six.

- e) 4,509,807

Answer: Four million, five hundred and nine thousand, eight hundred and seven.

- f) 7,001,001

Answer: Seven million, one thousand and one.

4. Write the given numbers in figures.

Answers:

a) 2,852,121

b) 7,300,275

c) 1,009,909

d) 8,795,501

e) 9,201,117

f) 5,000,005

5. Write the following in expanded form.

Answers:

a) $6,458,665 = 6,000,000 + 400,000 + 50,000 + 8,000 + 600 + 60 + 5$

b) $9,411,560 = 9,000,000 + 400,000 + 10,000 + 1,000 + 500 + 60 + 0$

c) $2,621,878 = 2,000,000 + 600,000 + 20,000 + 1,000 + 800 + 70 + 8$

d) $7,229,862 = 7,000,000 + 200,000 + 20,000 + 9,000 + 800 + 60 + 2$

e) $8,682,695 = 8,000,000 + 600,000 + 80,000 + 2,000 + 600 + 90 + 5$

Learning Check 1.2

1. Add the following.

a)

	T. Th	T. Th	Th	H	T	O
		^① 4	^① 5,	2	3	1
+	2	1	9,	8	6	7
	2	6	5,	0	9	8

b)

	T. Th	T. Th	Th	H	T	O
	^① 1	^① 5	6,	3	^① 4	9
+	7	4	5,	2	3	1
	9	0	1,	5	8	0

c)

	T. Th	T. Th	Th	H	T	O
		5	3,	^① 0	^① 0	9
+	3	2	4,	5	9	1
	3	7	7,	6	0	0

d)

	T. Th	T. Th	Th	H	T	O
	^① 6	1	0,	0	0	5
+	4	9	9,	8	8	1
	1, 1	0	9,	8	8	6

e)

	T. Th	T. Th	Th	H	T	O
	^① 8	9	^① 4,	5	1	2
+		1	2,	5	4	3
	9	0	7,	0	5	5

f)

	T. Th	T. Th	Th	H	T	O
		5	6,	1	^① 2	9
+	4	1	0,	1	2	4
	4	6	6,	2	5	3

g)

	T. Th	T. Th	Th	H	T	O
	7	3	5,	0	2	4
+	3	2	1,	9	1	4
	1, 0	5	6,	9	3	8

h)

	T. Th	T. Th	Th	H	T	O
	8	1	2,	3	^① 4	5
+	7	2	1,	3	4	5
	1, 5	3	3,	6	9	0

2. Subtract the following.

a)

T. Th	T. Th	Th	H	T	O
⁶ 7	¹ 2	⁹ 0,	⁹ 0	¹ 1	2
– 5	6	4,	8	2	1
1	6	5	1	9	1

b)

T. Th	T. Th	Th	H	T	O
⁸ 9	¹ 3	4,	5	6	1
– 4	9	3,	0	3	0
4	4	1,	5	3	1

c)

T. Th	T. Th	Th	H	T	O
⁵ 6	¹ 2	² 3,	¹ 2	2	1
– 4	9	8,	7	2	1
1	3	4,	5	0	0

d)

T. Th	T. Th	Th	H	T	O
6	2	4,	⁵ 6	¹ 2	¹ 4
–	1	2,	4	5	6
6	1	2,	1	6	8

e)

T. Th	T. Th	Th	H	T	O
4	² 3	¹ 2,	⁵ 6	¹ 0	9
– 3	0	9,	8	1	2
1	2	2,	7	9	7

f)

T. Th	T. Th	Th	H	T	O
⁷ 8	¹ 2	¹ 4,	⁶ 7	⁵ 6	¹ 1
– 5	9	8,	5	7	7
2	2	6,	1	8	4

g)

T. Th	T. Th	Th	H	T	O
⁶ 7	¹ 5	⁰ 1,	¹ 2	¹ 1	2
– 6	7	3,	4	3	2
0	8	7,	7	8	0

h)

T. Th	T. Th	Th	H	T	O
⁸ 9	⁹ 0	⁹ 0,	⁹ 0	⁹ 0	¹ 0
– 5	4	1,	1	2	3
3	5	8,	8	7	7

3. Qadeer bought two motorcycles. The price of one is Rs 145,890 and the price of the other is Rs 198,575. Find:

a) the total amount he spent.

b) the difference between the price of the two motorcycles.

a) Price of one motorcycle = Rs $\begin{array}{r} \textcircled{1} \textcircled{1} \textcircled{1} \textcircled{1} \\ 145890 \end{array}$

Price of other motorcycle = Rs $\begin{array}{r} + 198575 \\ \hline \end{array}$

Total amount spent = Rs $\begin{array}{r} 344465 \\ \hline \end{array}$

So, he spent Rs 344,465 altogether.

b) Price of other motorcycle = Rs $\begin{array}{r} \textcircled{7} \textcircled{1} \textcircled{4} \textcircled{1} \\ 198575 \end{array}$

Price of one motorcycle = Rs $\begin{array}{r} + 145890 \\ \hline \end{array}$

Difference between the price = Rs $\begin{array}{r} 052685 \\ \hline \end{array}$

So, the difference between their prices is Rs 52,685

4. The population of town A is 624,589 and that of town B is 490,856.

- a) What is the total population of both towns?
 b) What is the difference between the population of both towns?

$$\begin{array}{rcl}
 \text{a) Population of town A} & = & \overset{\textcircled{1}}{6} \overset{\textcircled{1}}{2} \overset{\textcircled{1}}{4} 589 \\
 \text{Population of town B} & = & + \quad 490856 \\
 \hline
 \text{Total population of both towns} & = & 1114445
 \end{array}$$

So, the total population of both towns is 1,114,545.

$$\begin{array}{rcl}
 \text{b) Population of town A} & = & \overset{\textcircled{5}}{\cancel{6}} \overset{\textcircled{1}}{2} \overset{\textcircled{3}}{\cancel{4}} \overset{\textcircled{1}}{5} 89 \\
 \text{Population of town B} & = & - \quad 490856 \\
 \hline
 \text{Difference in population of both towns} & = & 133733
 \end{array}$$

So, there is a difference of 133,733 in the population of both towns.

5. The annual income of Farhan is Rs 754,556 and the annual income of Saad is Rs 852,560. How much more does Saad earn annually than Farhan?

$$\begin{array}{rcl}
 \text{Income of Saad} & = & \text{Rs.} \quad \overset{\textcircled{7}}{\cancel{8}} \overset{\textcircled{1}}{5} \overset{\textcircled{4}}{\cancel{2}} \overset{\textcircled{5}}{\cancel{5}} \overset{\textcircled{1}}{\cancel{6}} 0 \\
 \text{Income of Farhan} & = & \text{Rs.} \quad - \quad 754556 \\
 \hline
 \text{Difference between income of both} & = & \text{Rs.} \quad 098004
 \end{array}$$

So, Saad earns Rs. 98,004 more annual than Farhan.

6. In a town, 325,655 aluminium tins were recycled in March and 523,453 tins were recycled in April. Find:

- a) the total number of tins recycled.
 b) in which month were less tins recycled and by how much?

$$\begin{array}{rcl}
 \text{a) Tins recycled in April} & = & \overset{\textcircled{1}}{5} \overset{\textcircled{1}}{2} 3453 \\
 \text{Tins recycled in March} & = & + \quad 325655 \\
 \hline
 \text{Total No. of tins recycled} & = & 849108
 \end{array}$$

So, 849,108 tins were recycled in both months.

$$\begin{array}{rcl}
 \text{b) Tins recycled in April} & = & \overset{\textcircled{4}}{\cancel{5}} \overset{\textcircled{1}}{\cancel{2}} \overset{\textcircled{2}}{\cancel{3}} \overset{\textcircled{3}}{\cancel{4}} \overset{\textcircled{4}}{\cancel{5}} 3 \\
 \text{Tins recycled in March} & = & - \quad 325655 \\
 \hline
 \text{Total No. of tins recycled} & = & 197798
 \end{array}$$

So, in the month of March 197,798 recycled less tins than in the month of April.

7. A charity organization collected Rs 982,456 in a month. It donated Rs 342,565 and Rs 500,560 respectively to two orphanages.

What amount is left?

$$\begin{array}{rcl}
 \text{Amount donated to one orphanage} & = & \text{Rs } \overset{\textcircled{1}}{3} \overset{\textcircled{1}}{4} 2 5 6 5 \\
 \text{Amount donated to second orphanage} & = & \text{Rs } + 5 0 0 5 6 0 \\
 \hline
 \text{Total amount donated to two orphanages} & = & \text{Rs } 8 4 3 1 2 5
 \end{array}$$

Now, to find out the amount left, we have to subtract the total amount donated to both orphanages from the total charity collected by the organization in a month.

$$\begin{array}{rcl}
 \text{Amount collected in a month} & = & \text{Rs } \overset{7}{9} \overset{\textcircled{1}}{8} 2 4 5 6 \\
 \text{Total amount donated} & = & \text{Rs } - 8 4 3 1 2 5 \\
 \hline
 \text{Amount left} & = & \text{Rs } 1 3 9 3 3 1
 \end{array}$$

So, Rs 139,331 were left after donation.

Learning Check 1.3

1. Multiply the following.

a) $34,591 \times 100$

Solution:

$$\begin{array}{r}
 34591 \\
 \times 100 \\
 \hline
 00000 \\
 000000 \\
 + 3459100 \\
 \hline
 3459100
 \end{array}$$

b) $45,901 \times 10$

Solution:

$$\begin{array}{r}
 45091 \\
 \times 10 \\
 \hline
 00000 \\
 + 450910 \\
 \hline
 450910
 \end{array}$$

c) $984,521 \times 10$

Solution:

$$\begin{array}{r}
 984521 \\
 \times 10 \\
 \hline
 000000 \\
 + 9845210 \\
 \hline
 9845210
 \end{array}$$

d) $15,382 \times 100$

Solution:

$$\begin{array}{r}
 15382 \\
 \times 100 \\
 \hline
 00000 \\
 000000 \\
 + 1538200 \\
 \hline
 1538200
 \end{array}$$

e) $34,705 \times 100$

Solution:

$$\begin{array}{r}
 34705 \\
 \times 100 \\
 \hline
 00000 \\
 000000 \\
 + 3470500 \\
 \hline
 3470500
 \end{array}$$

f) $984,654 \times 100$

Solution:

$$\begin{array}{r}
 984654 \\
 \times 100 \\
 \hline
 000000 \\
 0000000 \\
 + 98465400 \\
 \hline
 98465400
 \end{array}$$

g) $354,648 \times 1000$

Solution:

$$\begin{array}{r}
 354648 \\
 \times 1000 \\
 \hline
 000000 \\
 0000000 \\
 00000000 \\
 + 354648000 \\
 \hline
 354648000
 \end{array}$$

h) $614,544 \times 1000$

Solution:

$$\begin{array}{r}
 614544 \\
 \times 1000 \\
 \hline
 000000 \\
 0000000 \\
 00000000 \\
 + 614544000 \\
 \hline
 614544000
 \end{array}$$

i) $284,786 \times 1000$

Solution:

$$\begin{array}{r}
 284786 \\
 \times 1000 \\
 \hline
 000000 \\
 0000000 \\
 00000000 \\
 + 284786000 \\
 \hline
 284786000
 \end{array}$$

2. Find the product of the following.

a) 78987×54

Solution:

$$\begin{array}{r}
 \begin{array}{ccccccc}
 4 & 4 & 4 & 3 & & & \\
 3 & 3 & 3 & 2 & & &
 \end{array} \\
 78987 \\
 \times 54 \\
 \hline
 315948 \\
 + 3949350 \\
 \hline
 4265298
 \end{array}$$

b) $20,400 \times 999$

Solution:

$$\begin{array}{r}
 \begin{array}{c} 3 \\ 20400 \end{array} \\
 \times 999 \\
 \hline
 \begin{array}{c} 1 \\ 183600 \end{array} \\
 \begin{array}{c} 1 \\ 1836000 \end{array} \\
 + \begin{array}{c} 1 \\ 18360000 \end{array} \\
 \hline
 20379600
 \end{array}$$

c) $64,5486 \times 584$

Solution:

$$\begin{array}{r}
 645486 \\
 \times 584 \\
 \hline
 2581944 \\
 51638880 \\
 + 322743000 \\
 \hline
 376963824
 \end{array}$$

d) $45,678 \times 606$

Solution:

$$\begin{array}{r}
 45678 \\
 \times 606 \\
 \hline
 274068 \\
 0000000 \\
 + 27406800 \\
 \hline
 27680868
 \end{array}$$

e) $678,906 \times 123$

Solution:

$$\begin{array}{r}
 678906 \\
 \times 123 \\
 \hline
 2036718 \\
 13578120 \\
 + 67890600 \\
 \hline
 83505438
 \end{array}$$

f) $435,622 \times 789$

Solution:

$$\begin{array}{r}
 435622 \\
 \times 789 \\
 \hline
 3920598 \\
 34849760 \\
 + 304935400 \\
 \hline
 343705758
 \end{array}$$

g) $45,323 \times 783$

Solution:

$$\begin{array}{r} 45322 \\ \times 783 \\ \hline 135969 \\ 3625840 \\ + 31726100 \\ \hline 35487909 \end{array}$$

h) $564,785 \times 1000$

Solution:

$$\begin{array}{r} 564785 \\ \times 1000 \\ \hline 000000 \\ 0000000 \\ 00000000 \\ + 564785000 \\ \hline 564785000 \end{array}$$

i) $121,245 \times 33$

Solution:

$$\begin{array}{r} 121245 \\ \times 33 \\ \hline 363735 \\ + 3637350 \\ \hline 4001085 \end{array}$$

3. Asad's monthly income is Rs 72,348. Find his total income for 10 months

Solution:

$$\begin{aligned} \text{Asad's monthly income} &= \text{Rs } 72,348 \\ \text{Number of months} &= 10 \\ \text{Total number for 10 months} &= \text{Rs } 72,348 \times 10 \\ &= \text{Rs } 723,480 \end{aligned}$$

So, Saad's total income for 10 months is Rs 723480

<u>Working</u> $\begin{array}{r} 72348 \\ \times 10 \\ \hline 00000 \\ + 723480 \\ \hline 723480 \end{array}$
--

4. The cost of one scanner is Rs 12,599. Find:

a) Solution:

$$\begin{aligned} \text{Cost of one scanner} &= \text{Rs } 12,599 \\ \text{Cost of 10 scanners} &= \text{Rs } 12,599 \times 10 \\ &= \text{Rs } 125,990 \end{aligned}$$

So, the cost of 10 scanners is Rs 125,990.

<u>Working</u> $\begin{array}{r} 12599 \\ \times 10 \\ \hline 00000 \\ + 125990 \\ \hline 125990 \end{array}$
--

b) Solution:

Cost of one scanner = Rs 12,599

Cost of 100 scanners = Rs 12,599 $\times$ 100
= Rs 125,9900

So, the cost of 100 scanners is Rs 125,9900.

Working	
1 2 5 9 9	
$\times$ 1 0 0	
0 0 0 0 0	
0 0 0 0 0 0	
+ 1 2 5 9 9 0 0	
1 2 5 9 9 0 0	

c) Solution:

Cost of one scanner = Rs 12,599

Cost of 1000 scanners = Rs 12,599 $\times$ 1000
= Rs 12,599,000

So, the cost of 1000 scanners is Rs 125,99000.

Working	
1 2 5 9 9	
$\times$ 1 0 0 0	
0 0 0 0 0	
0 0 0 0 0 0	
0 0 0 0 0 0 0	
+ 1 2 5 9 9 0 0 0	
1 2 5 9 9 0 0 0	

5. A factory bought 398 laptops for its employees. The cost of one laptop is Rs 113,450. How much did the factory spend altogether?

Solution:

Number of laptops = 398

Cost of one laptop = Rs 113,450

Cost of 398 laptops = Rs 113,450 $\times$ 398
= Rs 45153100

So, the company spent Rs 45153100 altogether.

Calculation	
1 1 3 4 5 0	
$\times$ 3 9 8	
9 0 7 6 0 0	
1 0 2 1 0 5 0 0	
+ 3 4 0 3 5 0 0 0	
4 5 1 5 3 1 0 0	

Learning Check 1.4

1. Divide the following.

a) $43,800 \div 10$

Solution:

$$\begin{array}{r}
 4380 \\
 10 \overline{) 43800} \\
 \underline{-40} \\
 38 \\
 \underline{-30} \\
 80 \\
 \underline{-80} \\
 00
 \end{array}$$

So, $43800 \div 10 = 4380$

b) $85,000 \div 10$

Solution:

$$\begin{array}{r}
 8500 \\
 10 \overline{) 85000} \\
 \underline{-80} \\
 50 \\
 \underline{-50} \\
 00 \\
 \underline{-00} \\
 00 \\
 \underline{00} \\
 0
 \end{array}$$

So, $85000 \div 10 = 8500$

c) $73,000 \div 10$

Solution:

$$\begin{array}{r}
 7200 \\
 10 \overline{) 72000} \\
 \underline{-70} \\
 20 \\
 \underline{-20} \\
 00 \\
 \underline{-00} \\
 00 \\
 \underline{00} \\
 0
 \end{array}$$

So, $72000 \div 10 = 7200$

d) $95,400 \div 100$

Solution:

$$\begin{array}{r}
 954 \\
 100 \overline{) 95400} \\
 \underline{-900} \\
 540 \\
 \underline{-500} \\
 400 \\
 \underline{-400} \\
 0
 \end{array}$$

So, $95400 \div 100 = 954$

e) $54,500 \div 100$

Solution:

$$\begin{array}{r}
 \overline{545} \\
 100 \overline{) 54500} \\
 \underline{-500} \downarrow \\
 450 \downarrow \\
 \underline{-400} \downarrow \\
 500 \\
 \underline{-500} \\
 0
 \end{array}$$

So, $54,500 \div 100 = 545$

f) $65,400 \div 100$

Solution:

$$\begin{array}{r}
 \overline{654} \\
 100 \overline{) 65400} \\
 \underline{-600} \downarrow \\
 540 \downarrow \\
 \underline{-500} \downarrow \\
 400 \\
 \underline{-400} \\
 0
 \end{array}$$

So, $65400 \div 100 = 654$

g) $65,000 \div 1000$

Solution:

$$\begin{array}{r}
 \overline{65} \\
 1000 \overline{) 65000} \\
 \underline{-6000} \downarrow \\
 5000 \\
 \underline{-5000} \\
 0
 \end{array}$$

So, $65,000 \div 1000 = 65$

h) $45,000 \div 1000$

Solution:

$$\begin{array}{r}
 \overline{45} \\
 1000 \overline{) 45000} \\
 \underline{-4000} \downarrow \\
 5000 \\
 \underline{-5000} \\
 0
 \end{array}$$

So, $45000 \div 1000 = 45$

i) $97,000 \div 1000$

Solution:

$$\begin{array}{r}
 \overline{97} \\
 1000 \overline{) 97000} \\
 \underline{-9000} \downarrow \\
 7000 \\
 \underline{-7000} \\
 0
 \end{array}$$

So, $97,000 \div 1000 = 97$

2. Solve the following.

a) $1384 \div 22$

Solution:

$$\begin{array}{r} 62 \\ 22 \overline{) 1384} \\ \underline{-132} \downarrow \\ 64 \\ - 44 \\ \hline 20 \end{array}$$

So, $1384 \div 22 = 62 \text{ r } 20$

b) $54,165 \div 55$

Solution:

$$\begin{array}{r} 984 \\ 55 \overline{) 54165} \\ \underline{-495} \downarrow \downarrow \\ 466 \\ - 440 \downarrow \\ \hline 265 \\ - 220 \\ \hline 45 \end{array}$$

So, $54,165 \div 55 = 984 \text{ r } 45$

c) $68,964 \div 31$

Solution:

$$\begin{array}{r} 2224 \\ 31 \overline{) 68964} \\ \underline{-62} \downarrow \downarrow \downarrow \\ 69 \\ - 62 \downarrow \\ \hline 76 \downarrow \\ - 62 \downarrow \\ \hline 144 \\ - 124 \\ \hline 20 \end{array}$$

So, $68964 \div 31 = 2224 \text{ r } 20$

d) $78,954 \div 44$

Solution:

$$\begin{array}{r} 1794 \\ 44 \overline{) 78954} \\ \underline{-44} \downarrow \downarrow \downarrow \\ 349 \\ - 308 \downarrow \\ \hline 415 \downarrow \\ - 396 \downarrow \\ \hline 194 \\ - 176 \\ \hline 18 \end{array}$$

So, $78954 \div 44 = 1794 \text{ r } 18$

e) $15977 \div 36$

Solution:

$$\begin{array}{r}
 443 \\
 36 \overline{) 15977} \\
 \underline{-144} \downarrow \\
 157 \downarrow \\
 \underline{-144} \downarrow \\
 137 \downarrow \\
 \underline{-108} \\
 29
 \end{array}$$

So, $15977 \div 36 = 443 \text{ r } 29$

f) $24678 \div 78$

Solution:

$$\begin{array}{r}
 316 \\
 78 \overline{) 24678} \\
 \underline{-234} \downarrow \\
 127 \downarrow \\
 \underline{-78} \downarrow \\
 498 \downarrow \\
 \underline{-468} \\
 30
 \end{array}$$

So, $24678 \div 78 = 316 \text{ r } 30$

g) $47,596 \div 62$

Solution:

$$\begin{array}{r}
 767 \\
 62 \overline{) 47596} \\
 \underline{-434} \downarrow \\
 419 \downarrow \\
 \underline{-372} \downarrow \\
 476 \downarrow \\
 \underline{-434} \\
 42
 \end{array}$$

So, $47,596 \div 62 = 767 \text{ r } 42$

h) $36,764 \div 24$

Solution:

$$\begin{array}{r}
 1531 \\
 24 \overline{) 36764} \\
 \underline{-24} \downarrow \\
 127 \downarrow \\
 \underline{-120} \downarrow \\
 76 \downarrow \\
 \underline{-72} \downarrow \\
 44 \downarrow \\
 \underline{-24} \\
 20
 \end{array}$$

So, $36,764 \div 24 = 1531 \text{ r } 20$

i) $69,488 \div 56$

Solution:

$$\begin{array}{r}
 1240 \\
 56 \overline{) 69488} \\
 \underline{-56} \downarrow \\
 134 \downarrow \\
 \underline{-112} \downarrow \\
 228 \downarrow \\
 \underline{-224} \downarrow \\
 48
 \end{array}$$

So, $69,488 \div 56 = 1240 \text{ r } 48$

3. 72,453 pearls are to be equally divided to make 55 necklaces.

a)

Solution:

$$\begin{aligned}\text{Number of necklaces to be made} &= 55 \\ \text{Number of pearls} &= 72,453 \\ \text{Number of pearls in each necklace} &= 72453 \div 55 \\ &= 1317 \text{ r } 18\end{aligned}$$

So, there will be 1317 pearls in each necklace.

b)

Answer:

As, $72453 \div 55 = 1317 \text{ r } 18$
so, out of 72453 pearls, 18 pearls will be left.

Calculation	
	1 3 1 7
55	$\overline{) 72453}$
	$\underline{- 55} \quad \downarrow \quad \downarrow \quad \downarrow$
	1 7 4
	$\underline{- 165} \quad \downarrow$
	9 5
	$\underline{- 55} \quad \downarrow$
	4 0 3
	$\underline{- 385}$
	1 8

4. 17,145 markers are to be packed in 72 boxes equally.

a)

Solution:

$$\begin{aligned}\text{Number of markers} &= 17145 \\ \text{Number of boxes} &= 72 \\ \text{Number of markers in each box} &= 17145 \div 72 \\ &= 238 \text{ r } 9\end{aligned}$$

So, there will be 238 markers in each box.

b)

Answer:

There will be 9 markers left unpacked.

Calculation	
	2 3 8
72	$\overline{) 17145}$
	$\underline{- 144} \quad \downarrow \quad \downarrow \quad \downarrow$
	2 7 4
	$\underline{- 216} \quad \downarrow$
	5 8 5
	$\underline{- 576}$
	9

5. A car manufacturer produced 44,928 cars in 13 months. How many cars were produced in one month (considering the same number of cars were produced each month)?

Solution:

$$\begin{aligned}\text{Total number of cars produced} &= 44,928 \\ \text{Total number of months} &= 13 \\ \text{Cars produced in one month} &= 44928 \div 13 \\ &= 3456\end{aligned}$$

So, 3456 cars were produced in one month.

Calculation	
	3 4 5 6
13	$\overline{) 44928}$
	$\underline{- 39}$
	5 9
	$\underline{- 52}$
	7 2
	$\underline{- 65}$
	7 8
	$\underline{- 78}$
	0

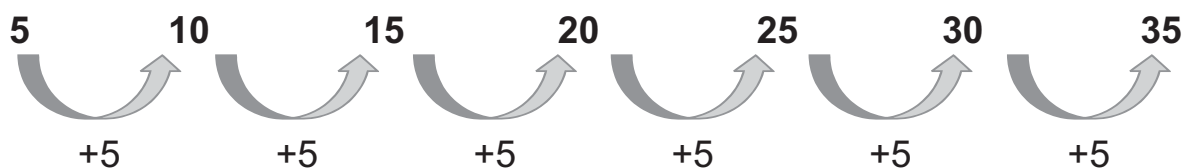
Learning Check 1.5

1. Identify the rules for the following patterns and write the next three terms for each.

a) 5, 10, 15, 20, _____, _____, _____

Solution:

Rule = add 5

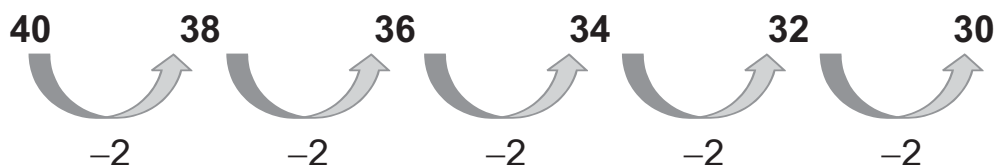


So, 5, 10, 15, 20, 25, 30, 35

b) 40, 38, 36, _____, _____, _____

Solution:

Rule = Subtract 2

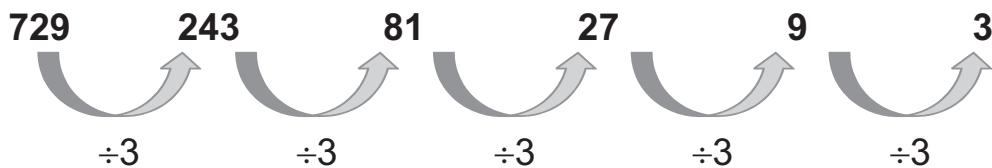


So, 40, 38, 36, 34, 32, 30

c) 729, 243, 81, _____, _____, _____

Solution:

Rule = Divide by 3

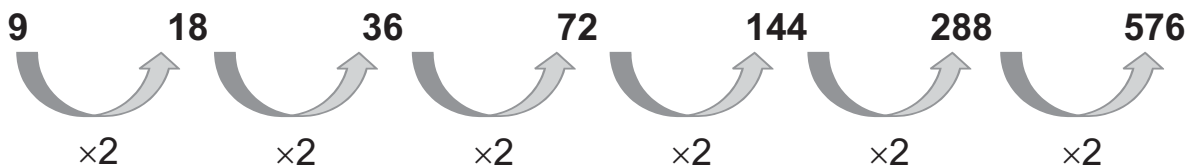


So, 729, 243, 81, 27, 9, 3

d) 9, 18, 36, 72, _____, _____, _____

Solution:

Rule = Multiply by 2

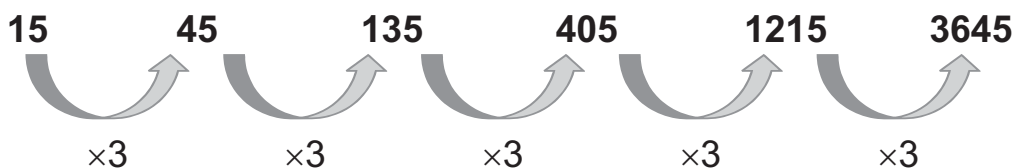


So, 9, 18, 36, 72, 144, 288, 576

e) 15, 45, 135, _____, _____, _____

Solution:

Rule = Multiply by 3

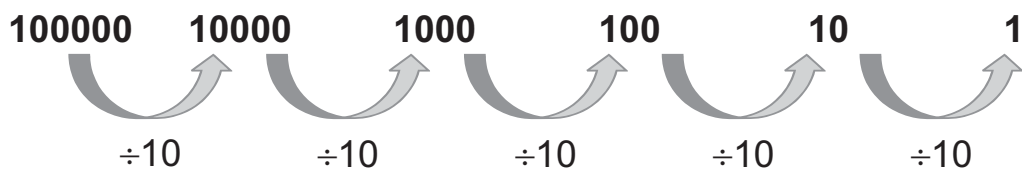


So, 15, 45, 135, 405, 1215, 3645

f) 100,000, 10000, 1000, _____, _____, _____

Solution:

Rule = Divide by 10

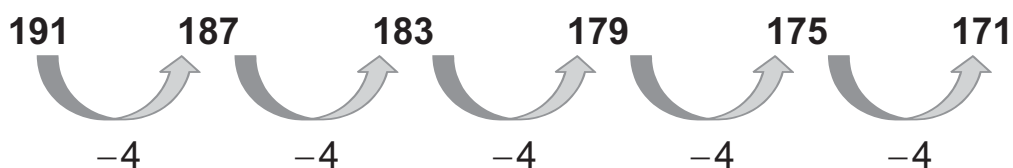


So, 100000, 10000, 1000, 100, 10, 1

g) 191, 187, 183, _____, _____, _____

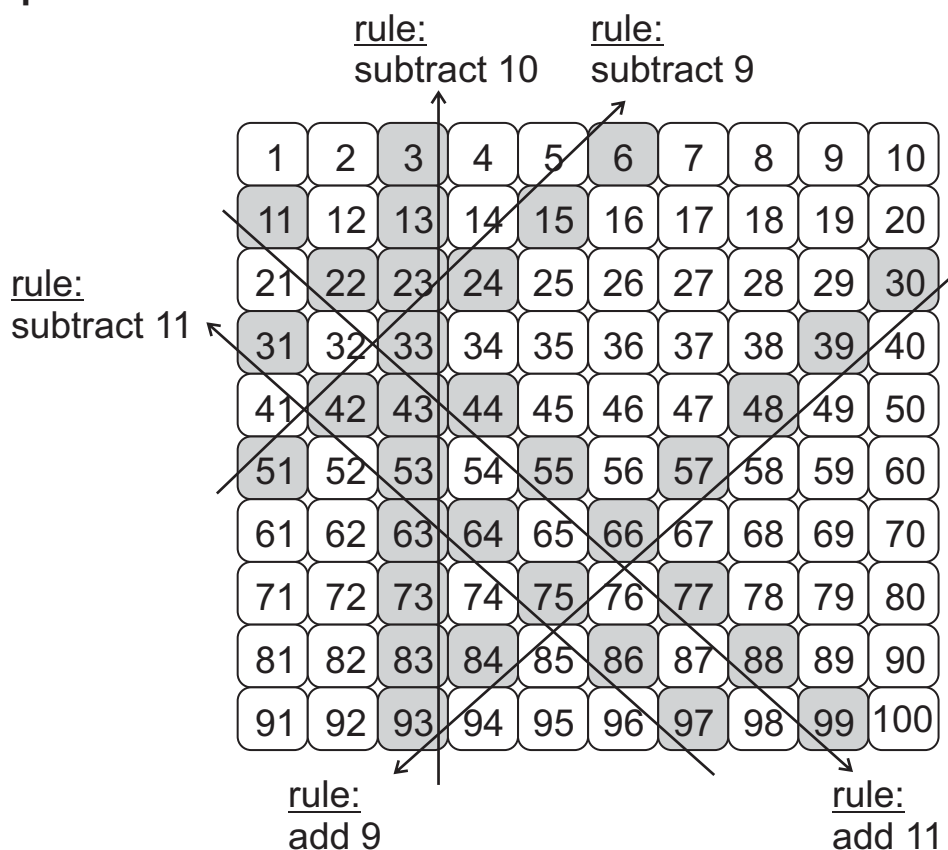
Solution:

Rule = Subtract 4



So, 191, 187, 183, 179, 175, 171

2. Look at the hundreds chart. Find colour and write the rule for at least 5 patterns.



Patterns	Rules
1) 30, 39, 48, 57, 66, 75, 84, 93	rule: add 9
2) 51, 42, 33, 24, 15, 6	rule: subtract 9
3) 11, 22, 33, 44, 55, 66, 77, 88, 99	rule: add 11
4) 97, 86, 75, 64, 53, 42, 31	rule: subtract 11
5) 93, 83, 73, 63, 53, 43, 33, 23, 13, 3	rule: subtract 10

3. Observe the following tables and find rule for each pattern.

a)

Rule: _____	
Number (In)	Number (Out)
50	10
100	20
200	40
500	100
600	120

Answer:

As we can see from the pattern that each number when divided by 5, gives the corresponding result i.e. $50 \div 5 = 10$, $100 \div 5 = 20$, etc. So, the rule here is:
So, Rule: Divide by 5.

b)

Rule: _____	
Number (In)	Number (Out)
2	8
4	16
6	24
8	32
10	40

Answer:

As we can see from the pattern that each result is obtained when the corresponding number is multiplied by 4 i.e. $2 \times 4 = 8$, $4 \times 4 = 16$, $6 \times 4 = 24$ and so on.
So, Rule: Multiply by 4.

c)

Rule: _____	
Number (In)	Number (Out)
3	12
10	19
12	21
20	29
22	31

Answer:

In this pattern we can see that each result is obtained when the corresponding number is added 9 to it, i.e. $3 + 9 = 12$, $10 + 9 = 19$, $12 + 9 = 21$ and so on
So, Rule: Add 9

d)

Rule: _____	
Number (In)	Number (Out)
88	80
72	64
60	52
54	46
42	34

Answer:

In this pattern each result is obtained when 8 is subtracted from the corresponding number, i.e. $88 - 8 = 80$, $72 - 8 = 64$ and so on.
So, Rule: Subtract 8

Unit Check 1

1. Encircle the correct options.

- a) (iv) 1,000,000
- b) (i) 798,215
- c) (ii) 660,989
- d) (i) 11,535,272
- e) (iii) 2303

2. Write the following numbers in words.

- a) 6,740,352

In words:

Six million, seven hundred and forty thousand, three hundred and fifty two.

- b) 1,753,648

In words:

One million, seven hundred and fifty three thousand, six hundred and forty-eight.

- c) 5,528,741

In words:

Five million, five hundred and twenty-eight thousand, seven hundred and forty-one.

- d) 1,052,376

In words:

One million, fifty-two thousand, three hundred and seventy-six.

3. Write these numbers in figures.

- a) 7,225,502
- b) 1,122,001
- c) 9,945,603
- d) 3,100,055

4. Add the following.

a) $390,000 + 234,569$

Solution:

$$\begin{array}{r} 390000 \\ + 234569 \\ \hline 624569 \end{array}$$

b) $721,981 + 452,901$

Solution:

$$\begin{array}{r} 721981 \\ + 452901 \\ \hline 1174882 \end{array}$$

c) $542,134 + 300,900$

Solution:

$$\begin{array}{r} 542134 \\ + 300900 \\ \hline 843034 \end{array}$$

d) $565,698 + 345,211$

Solution:

$$\begin{array}{r} 565698 \\ + 345211 \\ \hline 910909 \end{array}$$

5. Subtract the following.

a) $563,009 - 400,234$

Solution:

$$\begin{array}{r} 5\overset{2}{6}\overset{9}{3}009 \\ - 400234 \\ \hline 162775 \end{array}$$

b) $645,334 - 323,332$

Solution:

$$\begin{array}{r} 645334 \\ - 323332 \\ \hline 322002 \end{array}$$

c) $896,745 - 764,420$

Solution:

$$\begin{array}{r} 896745 \\ - 764420 \\ \hline 132325 \end{array}$$

d) $498,234 - 126,754$

Solution:

$$\begin{array}{r} 4\overset{7}{9}\overset{1}{8}\overset{1}{2}34 \\ - 126754 \\ \hline 371480 \end{array}$$

6. Multiply the following.

a) $38,123 \times 10$

Solution:

$$\begin{array}{r} 38123 \\ \times 10 \\ \hline 00000 \\ + 381230 \\ \hline 381230 \end{array}$$

b) $674,591 \times 1000$

Solution:

$$\begin{array}{r} 674591 \\ \times 1000 \\ \hline 000000 \\ 0000000 \\ + 674591000 \\ \hline 674591000 \end{array}$$

c) $96,045 \times 92$

Solution:

$$\begin{array}{r} 96045 \\ \times \quad 92 \\ \hline 192090 \\ + 8644050 \\ \hline 8836140 \end{array}$$

d) $48,479 \times 754$

Solution:

$$\begin{array}{r} 48479 \\ \times \quad 754 \\ \hline 193916 \\ 2423950 \\ + 33935300 \\ \hline 36553166 \end{array}$$

e) $886,655 \times 281$

Solution:

$$\begin{array}{r} 886,655 \\ \times \quad 281 \\ \hline 886655 \\ 70923400 \\ + 177331000 \\ \hline 249150055 \end{array}$$

f) $350,942 \times 723$

Solution:

$$\begin{array}{r} 350942 \\ \times \quad 723 \\ \hline 1052826 \\ 7018840 \\ + 245659400 \\ \hline 253731066 \end{array}$$

7. Divide the following.

a) $49,800 \div 10$

$$\begin{array}{r} 4980 \\ 10 \overline{) 49800} \\ \underline{-40} \downarrow \\ 98 \downarrow \\ \underline{-90} \downarrow \\ 80 \downarrow \\ \underline{-80} \downarrow \\ 00 \\ - 00 \\ \hline 0 \end{array}$$

So, $49,800 \div 10 = 4,980$

b) $14000 \div 1000$

$$\begin{array}{r} 14 \\ 1000 \overline{) 14000} \\ \underline{-10000} \downarrow \\ 4000 \\ - 4000 \\ \hline 0 \end{array}$$

So, $14000 \div 1000 = 14$

c) $78,754 \div 72$

$$\begin{array}{r}
 1093 \\
 72 \overline{) 78754} \\
 \underline{-72} \\
 675 \\
 \underline{-648} \\
 274 \\
 \underline{-216} \\
 58
 \end{array}$$

So, $78,754 \div 72 = 1093 \text{ r } 58$

d) $98,455 \div 35$

$$\begin{array}{r}
 2813 \\
 35 \overline{) 98455} \\
 \underline{-70} \\
 284 \\
 \underline{-280} \\
 45 \\
 \underline{-35} \\
 105 \\
 \underline{-105} \\
 0
 \end{array}$$

So, $98,455 \div 35 = 2813$

e) $63,568 \div 81$

$$\begin{array}{r}
 784 \\
 81 \overline{) 63568} \\
 \underline{-567} \\
 686 \\
 \underline{-648} \\
 388 \\
 \underline{-324} \\
 64
 \end{array}$$

So, $63,568 \div 81 = 74 \text{ r } 64$

f) $53,225 \div 56$

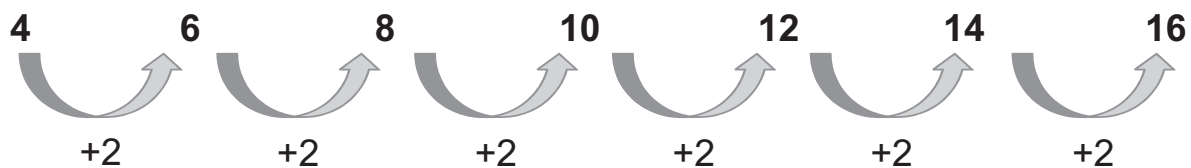
$$\begin{array}{r}
 950 \\
 56 \overline{) 53225} \\
 \underline{-504} \\
 282 \\
 \underline{-280} \\
 25
 \end{array}$$

So, $53225 \div 56 = 950 \text{ r } 25$

8. Identify the rules for the following patterns and write the next terms for each.

a) 4, 6, 8, 10, _____, _____, _____

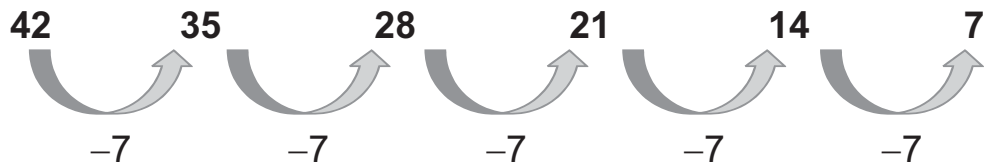
Rule = Add 2



So, 4, 6, 8, 10, 12, 14, 16

b) 42, 35, 28, _____, _____, _____

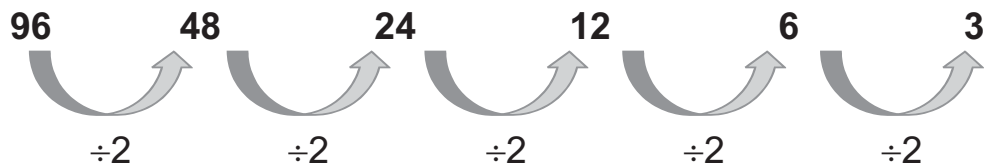
Rule = Subtract 7



So, 42, 35, 28, 21, 14, 7

c) 96, 48, 24, _____, _____, _____

Rule = Divide by 2



So, 96, 48, 24, 12, 6, 3

d) 3, 9, 27, _____, _____, _____

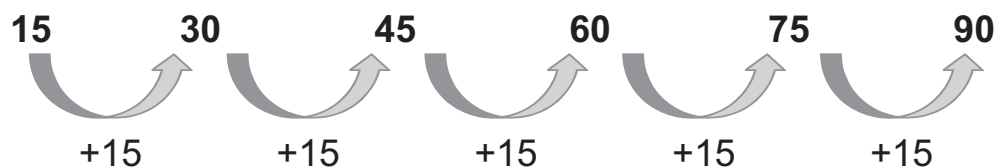
Rule = Multiply by 3



So, 3, 9, 27, 81, 243, 729

e) 15, 30, 45, _____, _____, _____

Rule = Add 15



So, 15, 30, 45, 60, 75, 90

9. Observe the following tables and find the rules for each pattern.

a)

Rule: _____	
Number (In)	Number (Out)
10	1
100	10
1000	100
10000	1000
100000	10000

Answer:

In this pattern each result is obtained when the corresponding number is divided by 10, i.e., $10 \div 10 = 1$, $100 \div 10 = 10$, etc.

So, Rule: Divide by 10.

b)

Rule: _____	
Number (In)	Number (Out)
1	7
2	14
3	21
4	28
5	35

Answer:

In this pattern each result is obtained if the corresponding number is multiplied by 7 i.e. $1 \times 7 = 7$, $2 \times 7 = 14$, etc.

So, Rule: Multiply by 7.

10. Razia has Rs 234,991 in her bank account. She withdraws Rs 200,023.

a)

Solution:

$$\begin{array}{rcl}
 \text{Razia has in her account} & = & \text{Rs } 2349\overset{8}{\cancel{9}}1 \\
 \text{She withdraws} & = & \text{Rs } 200023 \\
 \text{Amount left with her} & = & \underline{\text{Rs } 034968}
 \end{array}$$

So, 34,968 is left in her account.

b)

Solution:

$$\begin{aligned}\text{Amount left with Hadia} &= \text{Rs } 34,968 \\ \text{Number of Persons} &= 11 \\ \text{Each person will get} &= \text{Rs } 34,968 \div 11 \\ &= \text{Rs } 3178 \text{ r } 10\end{aligned}$$

So, 34,968 is left in her account.

c)

Solution:

Rs 10 left undistributed

Calculation

$$\begin{array}{r} 3178 \\ 11 \overline{) 34968} \\ \underline{-33} \\ 19 \\ \underline{-11} \\ 86 \\ \underline{-77} \\ 98 \\ \underline{-88} \\ 10 \end{array}$$

11. Arslan's income for 3 months is Rs 94,521 altogether.

a)

Solution:

$$\begin{aligned}\text{Number of months} &= 3 \\ \text{Arsalan's income for 3 months} &= \text{Rs } 94,521 \\ \text{Salary of each month} &= \text{Rs } 94,521 \div 3 \\ &= \text{Rs } 31507\end{aligned}$$

So, Arsalan's monthly salary is Rs. 31507.

b)

Solution:

$$\begin{aligned}\text{Arsalan's salary for one month} &= \text{Rs } 31507 \\ \text{Arsalan's salary for 6 months} &= \text{Rs } 31507 \times 6 \\ &= \text{Rs } 189042 \\ &= \end{aligned}$$

So, Arsalan's salary for 6 months is Rs 189042.

Calculation

$$\begin{array}{r} 31507 \\ 3 \overline{) 94521} \\ \underline{-9} \\ 4 \\ \underline{-3} \\ 15 \\ \underline{-15} \\ 021 \\ \underline{-21} \\ 0 \end{array}$$

$$\begin{array}{r} 31507 \\ \times 6 \\ \hline 189042 \end{array}$$

12. There are 657,300 books in one library and 231,200 books in another library.

a)

Solution:

$$\begin{array}{rcl} \text{Books in one library} & = & 657300 \\ \text{Books in second library} & = & + 231200 \\ \hline \text{Total number of book altogether} & = & 888500 \end{array}$$

So, there are 888,500 books in both libraries altogether.

b)

Solution:

$$\begin{array}{rcl} \text{Books in one library} & = & 657300 \\ \text{Books in second library} & = & - 231200 \\ \hline \text{Difference in number} & = & 426100 \end{array}$$

So, the difference in the number of books in both libraries is 426,100.

13. A property dealer buys a piece of land to construct flats. If the cost of one flat is Rs 359,990, what is the cost of 218 flats altogether?

Solution:

$$\begin{array}{rcl} \text{Price of one motorbike} & = & \text{Rs } 359,990 \\ \text{Number of motorbikes} & = & 218 \\ \text{Price of 218 motorbikes} & = & \text{Rs } 359,990 \times 218 \\ & = & \text{Rs } 78477820 \end{array}$$

So, the price of 218 motorbikes altogether is Rs 78477820.

Calculation	
359990	
×	218
2879920	
3599900	
+	71998000
78477820	

Unit 2: LCM and HCF

Learning Check 2.1

1. Find the HCF of the following numbers using the prime factorization method.

a) 12, 14

Solution:

2	12
2	6
3	3
	1

2	14
7	7
	1

Prime factorization of 12 = $2 \times 2 \times 3$

Prime factorization of 14 = 2×7

Common prime factors = 2

So, the HCF of 12 and 14 = 2

b) 40, 48

Solution:

2	40
2	20
2	10
5	5
	1

2	48
2	24
2	12
2	6
3	3
	1

Prime factorization of 40 = $2 \times 2 \times 2 \times 5$

Prime factorization of 48 = $2 \times 2 \times 2 \times 2 \times 3$

Common prime factors = $2, 2, 2$

Product of common prime factors = $2 \times 2 \times 2 = 8$

So, the HCF of 40 and 48 = 8

c) 28, 56

Solution:

2	28
2	14
7	7
	1

2	56
2	28
2	14
7	7
	1

Prime factorization of 28 = $2 \times 2 \times 7$

Prime factorization of 56 = $2 \times 2 \times 2 \times 7$

Common prime factors = 2, 2 and 7

Product of common prime factors = $2 \times 2 \times 7 = 28$

So, the HCF of 28 and 56 = 28

d) 16, 18, 20

Solution:

2	16
2	8
2	4
2	2
	1

2	18
3	9
3	3
	1

2	20
2	10
5	5
	1

Prime factorization of 16 = $2 \times 2 \times 2 \times 2$

Prime factorization of 18 = $2 \times 3 \times 3$

Prime factorization of 20 = $2 \times 2 \times 5$

Common prime factors = 2

Product of common prime factors = 2

HCF of 16, 18 and 20 = 2

e) 24, 42, 45

Solution:

2	24
2	12
2	6
3	3
	1

2	42
3	21
7	7
	1

3	45
3	15
5	5
	1

Prime factorization of 24 = $2 \times 2 \times 2 \times 3$

Prime factorization of 42 = $2 \times 3 \times 7$

Prime factorization of 45 = $3 \times 3 \times 5$

Common prime factors = 3

HCF of 24, 42 and 45 = 3

f) 35, 45

Solution:

5	35
7	7
	1

5	45
3	9
3	3
	1

Prime factorization of 35 = 5×7

Prime factorization of 45 = $5 \times 3 \times 3$

Common prime factors = 5

HCF of 35 and 45 = 5

g) 82, 88, 90

Solution:

2	82
41	41
	1

2	88
2	44
2	22
11	11
	1

2	90
3	45
3	15
5	5
	1

Prime factorization of 82 = 2×41

Prime factorization of 88 = $2 \times 2 \times 2 \times 11$

Prime factorization of 90 = $2 \times 3 \times 3 \times 5$

Common prime factors = 2

HCF of 82, 88 and 90 = 2

h) 36, 56, 64

Solution:

2	36
2	18
3	9
3	3
	1

2	56
2	28
2	14
7	7
	1

2	64
2	32
2	16
2	8
2	4
2	2
	1

Prime factorization of 36 = $2 \times 2 \times 3 \times 3$

Prime factorization of 56 = $2 \times 2 \times 2 \times 7$

Prime factorization of 64 = $2 \times 2 \times 2 \times 2 \times 2 \times 2$

Common prime factors = 2 and 2

Product of common prime factors = $2 \times 2 = 4$

HCF of 36, 56 and 64 = 4

2. Find the HCF of the following numbers using the division method.

a) 24, 26

Solution:

$$\begin{array}{r}
 \begin{array}{r} 1 \\ 24 \overline{) 26} \\ \underline{-24} \end{array} \quad \begin{array}{r} 12 \\ 24 \end{array} \\
 \begin{array}{r} \text{HCF} \longrightarrow 2 \overline{) 24} \\ \underline{-2} \\ 4 \\ \underline{4} \\ 0 \end{array}
 \end{array}$$

So, HCF of 24 and 26 = 2

b) 45, 75

Solution:

$$\begin{array}{r}
 \begin{array}{r} 1 \\ 45 \overline{) 75} \\ \underline{-45} \end{array} \quad \begin{array}{r} 1 \\ 30 \end{array} \\
 \begin{array}{r} \text{HCF} \longrightarrow 15 \overline{) 30} \\ \underline{-30} \\ 0 \end{array}
 \end{array}$$

So, HCF of 45 and 75 = 15

c) 16, 30

Solution:

$$\begin{array}{r}
 1 \\
 16 \overline{) 30} \\
 \underline{- 16} \quad 1 \\
 14 \overline{) 16} \\
 \underline{- 14} \quad 7 \\
 \text{HCF} \longrightarrow 2 \overline{) 14} \\
 \underline{- 14} \\
 0
 \end{array}$$

So, HCF of 16 and 30 = 2

d) 28, 38, 44

Solution:

$$\begin{array}{r}
 1 \\
 38 \overline{) 44} \\
 \underline{- 38} \quad 6 \\
 6 \overline{) 38} \\
 \underline{- 36} \quad 3 \\
 \text{HCF} \longrightarrow 2 \overline{) 6} \\
 \underline{- 6} \\
 0
 \end{array}
 \quad
 \begin{array}{r}
 14 \\
 2 \overline{) 28} \\
 \underline{- 2} \\
 8 \\
 \underline{- 8} \\
 0
 \end{array}$$

HCF of 28, 38, 44 = 2

so, HCF of 38 and 44 = 2

e) 26, 90, 98

Solution:

$$\begin{array}{r}
 1 \\
 90 \overline{) 98} \\
 \underline{- 90} \quad 11 \\
 8 \overline{) 90} \\
 \underline{- 8} \\
 10 \\
 8 \overline{) 10} \\
 \underline{- 8} \quad 4 \\
 2 \overline{) 8} \\
 \underline{- 8} \\
 0
 \end{array}$$

HCF of 90 and 98 = 2

Now,

$$\begin{array}{r}
 13 \\
 2 \overline{) 26} \\
 \underline{- 2} \\
 6 \\
 \underline{- 6} \\
 0
 \end{array}$$

So, HCF of 26, 90 and 98 = 2

f) 32, 64, 78

Solution:

$$\begin{array}{r}
 1 \\
 64 \overline{) 78} \\
 \underline{- 64} \quad 4 \\
 14 \overline{) 64} \\
 \underline{- 56} \quad 1 \\
 8 \overline{) 14} \\
 \underline{- 8} \quad 1 \\
 6 \overline{) 8} \\
 \underline{- 6} \quad 3 \\
 2 \overline{) 6} \\
 \underline{- 6} \\
 0
 \end{array}$$

HCF of 64 and 78 = 2

HCF of 64 and 78 = 2

Now,

$$\begin{array}{r}
 16 \\
 2 \overline{) 32} \\
 \underline{- 2} \\
 12 \\
 \underline{- 12} \\
 0
 \end{array}$$

So, HCF of 32, 64 and 78 = 2

g) 55, 65, 75

Solution:

$$\begin{array}{r}
 1 \\
 65 \overline{) 75} \\
 \underline{- 65} \quad 6 \\
 10 \overline{) 65} \\
 \underline{- 60} \quad 2 \\
 5 \overline{) 10} \\
 \underline{- 10} \\
 0
 \end{array}$$

HCF of 65 and 75 = 5

Now,

$$\begin{array}{r}
 11 \\
 5 \overline{) 55} \\
 \underline{- 5} \\
 5 \\
 \underline{- 5} \\
 0
 \end{array}$$

So, HCF of 55, 65 and 75 = 5

h) 30, 78, 60

Solution:

$$\begin{array}{r}
 1 \\
 60 \overline{) 78} \\
 \underline{- 60} \quad 3 \\
 18 \overline{) 60} \\
 \underline{- 54} \quad 3 \\
 6 \overline{) 18} \\
 \underline{- 18} \\
 0
 \end{array}$$

HCF of 60 and 78 = 6

Now,

$$\begin{array}{r}
 5 \\
 \text{HCF of } 30, 60, 78 \longrightarrow 6 \overline{) 30} \\
 \underline{- 30} \\
 0
 \end{array}$$

HCF of 30, 78 and 60 = 6

3. Find the greatest possible mass of kilogram bars that can exactly weigh objects of 30 kg, 45 kg and 90 kg.

Solution:

The greatest possible mass of kilogram bars can be obtained by finding the HCF of 30, 45 and 90.

$$\begin{array}{r|l}
 2 & 30 \\
 \hline
 3 & 15 \\
 \hline
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 3 & 45 \\
 \hline
 3 & 15 \\
 \hline
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

$$\begin{array}{r|l}
 2 & 90 \\
 \hline
 3 & 45 \\
 \hline
 3 & 15 \\
 \hline
 5 & 5 \\
 \hline
 & 1
 \end{array}$$

Prime factorization of 30 = $2 \times 3 \times 5$

Prime factorization of 45 = $3 \times 3 \times 5$

Prime factorization of 90 = $2 \times 3 \times 3 \times 5$

Common prime factors = 3×5

HCF of 30, 45 and 90 = 15

So, the greatest possible mass of kilogram bars that can exactly weigh objects of 30, 45 and 90 is "15".

4. Marwa has 42 blue pins and 36 red ones. She wants to put them in identical groups without any leftover pins. What is the maximum possible number of groups she can make?

Solution:

To find the maximum possible number of groups we find the HCF of 42 and 36.

$$\begin{array}{r}
 1 \\
 36 \overline{) 42} \\
 \underline{- 36} \quad 6 \\
 6 \overline{) 36} \\
 \underline{- 36} \\
 0
 \end{array}$$

So, HCF of 42 and 36 = 6

The maximum possible number of groups she can make = 6

5. Find the greatest number which exactly divides 46, 68 and 78 without a remainder.

To find the greatest possible number which exactly divides these numbers we have to find the HCF of these numbers. Using the division method.

$$\begin{array}{r}
 1 \\
 68 \overline{) 78} \\
 \underline{- 68} \quad 6 \\
 10 \overline{) 68} \\
 \underline{- 60} \quad 1 \\
 8 \overline{) 10} \\
 \underline{- 8} \quad 4 \\
 2 \overline{) 8} \\
 \underline{- 8} \\
 0
 \end{array}$$

$$\begin{array}{r}
 23 \\
 2 \overline{) 46} \\
 \underline{- 4} \\
 6 \\
 \underline{- 6} \\
 0
 \end{array}$$

HCF of 46, 68 and 78 = 2

So, the greatest possible number which exactly divides these numbers is "2".

Learning Check 2.2

1. Find the LCM of the given numbers using the prime factorization method.

a) 20, 50

Solution:

2	20
2	10
5	5
	1

2	50
5	25
5	5
	1

Prime factorization of 20 = $2 \times 2 \times 5$

Prime factorization of 50 = $2 \times 5 \times 5$

Common prime factors = 2, 5

non-common prime factors = 2, 5

LCM = Product of common prime factors of 2 or more numbers $\times$ Product of non-common prime factors

$$\text{LCM} = 2 \times 5 \times 2 \times 5$$

$$= 10 \times 10$$

$$= 100$$

So, the LCM of 20 and 50 = 100.

b) 18, 36

Solution:

2	18
3	9
3	3
	1

3	36
3	12
2	4
2	2
	1

Prime factorization of 18 = $2 \times 3 \times 3$

Prime factorization of 36 = $2 \times 3 \times 3 \times 2$

Common prime factors = 2, 3, 3

non-common prime factors = 2

$$\text{LCM} = \text{Product of common prime factors of 2 or more numbers} \times \text{Product of non-common prime factors}$$

$$\text{LCM} = 2 \times 3 \times 3 \times 2$$

$$= 18 \times 2$$

$$= 36$$

So, the LCM of 18 and 36 = 36.

c) 24, 42, 66

Solution:

2	24
2	12
2	6
3	3
	1

2	42
3	21
7	7
	1

2	66
3	33
11	11
	1

Prime factorization of 24 = $2 \times 2 \times 2 \times 3$

Prime factorization of 42 = $2 \times 3 \times 7$

Prime factorization of 66 = $2 \times 3 \times 11$

Common prime factors = 2, 3

non-common prime factors = 2, 2, 7, 11

$$\text{LCM} = \text{Product of common prime factors of 2 or more numbers} \times \text{Product of non-common prime factors}$$

$$\text{LCM} = 2 \times 3 \times 2 \times 2 \times 7 \times 11$$

$$= 6 \times 308$$

$$= 1848$$

So, the LCM of 24,42,66 is 1848.

d) 15, 25, 30

Solution:

3	15
5	5
	1

5	25
5	5
	1

2	30
3	15
5	5
	1

$$\begin{aligned}\text{Prime factorization of 15} &= 3 \times 5 \\ \text{Prime factorization of 25} &= 5 \times 5 \\ \text{Prime factorization of 30} &= 3 \times 5 \times 2\end{aligned}$$

$$\text{Common prime factors} = 3, 5$$

$$\text{non-common prime factors} = 2, 5$$

$$\text{LCM} = \text{Product of common prime factors of 2 or more numbers} \times \text{Product of non-common prime factors}$$

$$\begin{aligned}\text{LCM} &= 3 \times 5 \times 2 \times 5 \\ &= 15 \times 10 \\ &= 150\end{aligned}$$

So, the LCM of 15, 25 and 30 = 150

e) 26, 28, 48

Solution:

2	26
13	13
	1

2	28
2	14
7	7
	1

2	48
2	24
2	12
2	6
3	3
	1

$$\begin{aligned}\text{Prime factorization of 26} &= 2 \times 13 \\ \text{Prime factorization of 28} &= 2 \times 2 \times 7 \\ \text{Prime factorization of 48} &= 2 \times 2 \times 2 \times 2 \times 3\end{aligned}$$

$$\text{Common prime factors} = 2, 2$$

$$\text{non-common prime factors} = 13, 7, 2, 2, 3$$

$$\text{LCM} = \text{Product of common prime factors of 2 or more numbers} \times \text{Product of non-common prime factors}$$

$$\begin{aligned}\text{LCM} &= 2 \times 2 \times 13 \times 7 \times 2 \times 2 \times 3 \\ &= 4 \times 1092 \\ &= 4368\end{aligned}$$

So, the LCM of 26, 28 and 48 = 4368

f) 46, 78, 98

Solution:

2	46
23	23
	1

2	78
3	39
13	13
	1

2	98
7	49
7	7
	1

Prime factorization of 46 = 2×23

Prime factorization of 78 = $2 \times 3 \times 13$

Prime factorization of 98 = $2 \times 7 \times 7$

Common prime factors = 2

non-common prime factors = 2, 7, 7, 13, 23

LCM = Product of common prime factors of 2 or more numbers ×

Product of non-common prime factors

$$\text{LCM} = 2 \times 3 \times 7 \times 7 \times 13 \times 23$$

$$= 87,906$$

So, the LCM of 46,78 and 98 = 87906

g) 12, 24, 60

Solution:

2	12
2	6
3	3
	1

2	24
2	12
2	6
3	3
	1

2	60
2	30
3	15
5	5
	1

Prime factorization of 12 = $2 \times 2 \times 3$

Prime factorization of 24 = $2 \times 2 \times 2 \times 3$

Prime factorization of 60 = $2 \times 2 \times 3 \times 5$

Common prime factors = 2, 2, 3

non-common prime factors = 2, 5

LCM = Product of common prime factors of 2 or more numbers ×

Product of non-common prime factors

$$\text{LCM} = 2 \times 2 \times 3 \times 2 \times 5$$

$$= 12 \times 10$$

$$= 120$$

So, the LCM of 12,24 and 60 = 120

h) 45, 65, 75

Solution:

3	45
3	15
5	5
	1

5	65
13	13
	1

5	75
5	15
3	3
	1

Prime factorization of 45 = $3 \times \textcircled{3} \times 5$

Prime factorization of 65 = 5×13

Prime factorization of 75 = $5 \times 5 \times \textcircled{3}$

Common prime factors = 5, 3

non-common prime factors = 3, $\textcircled{13}$, 5

LCM = Product of common prime factors of 2 or more numbers $\times$ Product of non-common prime factors

$$\begin{aligned}\text{LCM} &= 3 \times 5 \times 3 \times 13 \times 5 \\ &= 15 \times 195 \\ &= 2925\end{aligned}$$

So, the LCM of 45, 65 and 75 = 2925

2. Find the LCM of the given numbers using the division method.

a) 50, 70

Solution:

2	50, 70
5	25, 35
5	5, 7
7	1, 7
	1, 1

L.C.M = Product of all prime factors

$$= 2 \times 5 \times 5 \times 7$$

$$= 350$$

So, the LCM of 50 and 70 = 350

b) 36, 46

Solution:

2	36, 46
2	18, 23
3	9, 23
3	3, 23
23	1, 23
	1

L.C.M = Product of all prime factors

$$= 2 \times 2 \times 3 \times 3 \times 23$$

$$= 828$$

So, the LCM of 36 and 46 = 828

c) 14, 42, 80

Solution:

2	14 , 42 , 80
2	7 , 21 , 40
2	7 , 21 , 20
2	7 , 21 , 10
7	7 , 21 , 5
3	1 , 3 , 5
5	1 , 1 , 5
	1 , 1 , 1

L.C.M = Product of all prime factors

$$= 2 \times 2 \times 2 \times 2 \times 7 \times 3 \times 5$$

$$= 1680$$

So, the LCM of 14,42 and 80 = 1680

d) 20, 30, 40

Solution:

2	20 , 30 , 40
5	10 , 15 , 20
2	2 , 3 , 4
2	1 , 3 , 2
3	1 , 3 , 1
	1 , 1 , 1

L.C.M = Product of all prime factors

$$= 2 \times 5 \times 2 \times 2 \times 3$$

$$= 120$$

So, the LCM of 20,30 and 40 = 120

e) 50, 60, 75

Solution:

5	50 , 60 , 75
2	10 , 12 , 15
2	5 , 6 , 15
5	5 , 3 , 15
3	1 , 3 , 3
	1 , 1 , 1

L.C.M = Product of all prime factors

$$= 2 \times 2 \times 3 \times 5 \times 5$$

$$= 300$$

So, the L.C.M of 50, 60 and 70 = 300

f) 44, 54, 70

Solution:

2	44 , 54 , 70
2	22 , 27 , 35
11	11 , 27 , 35
3	1 , 27 , 35
3	1 , 9 , 35
3	1 , 3 , 35
5	1 , 1 , 35
7	1 , 1 , 7
	1 , 1 , 1

$$\begin{aligned}\text{L.C.M} &= \text{Product of all prime factors} \\ &= 2 \times 2 \times 11 \times 3 \times 3 \times 3 \times 5 \times 7 \\ &= 41,580\end{aligned}$$

So, L.C.M of 44, 54 and 70 = 41580

g) 25, 35, 45

Solution:

5	25 , 35 , 45
5	5 , 7 , 9
7	1 , 7 , 9
3	1 , 1 , 9
3	1 , 1 , 3
	1 , 1 , 1

$$\begin{aligned}\text{L.C.M} &= \text{Product of all common factors} \\ &= 5 \times 5 \times 7 \times 3 \times 3 \\ &= 1575\end{aligned}$$

So, L.C.M of 25, 35 and 45 = 1575

h) 30, 60, 90

Solution:

2	30 , 60 , 90
3	15 , 30 , 45
5	5 , 10 , 15
2	1 , 2 , 3
3	1 , 1 , 3
	1 , 1 , 1

$$\begin{aligned}\text{L.C.M} &= \text{Product of all prime factors} \\ &= 2 \times 3 \times 5 \times 2 \times 3 \\ &= 180\end{aligned}$$

So, L.C.M of 30, 60 and 90 = 180

- 3. Find the minimum length of an electric wire which can be exactly cut into pieces of lengths 34 cm, 56 cm and 84 cm.**

Solution:

To find the minimum length of wire, we find the L.C.M of 34, 56 and 84.

So, using division method:

2	34 , 56 , 84
2	17 , 28 , 42
2	17 , 14 , 21
7	17 , 7 , 21
3	17 , 1 , 3
17	17 , 1 , 1
	1 , 1 , 1

$$\begin{aligned}\text{L.C.M} &= \text{Product of all prime factors} \\ &= 2 \times 2 \times 2 \times 7 \times 3 \times 17 \\ &= 2856\end{aligned}$$

So, the minimum length of electric wire should be 2856 cm, to be cut into pieces of given lengths.

- 4. What is the minimum number of cupcakes that can be divided among 56, 68 and 88 students exactly?**

Solution:

To find the minimum number of cupcakes we find L.C.M of 56, 68 and 88.

So, using division method:

2	56 , 68 , 88
2	28 , 34 , 44
2	14 , 17 , 22
7	7 , 17 , 11
17	1 , 17 , 11
11	1 , 1 , 11
	1 , 1 , 1

$$\begin{aligned}\text{L.C.M} &= \text{Product of all prime factors} \\ &= 2 \times 2 \times 2 \times 7 \times 17 \times 11 \\ &= 10,472\end{aligned}$$

So, the minimum number of cupcakes that can be divided exactly is 10,472.

- 5. Find the smallest number which is exactly divisible by 16, 18 and 26.**

Solution:

To find the smallest number we find L.C.M of 16, 18 and 26

So, using division method:

2	16 , 18 , 26
2	8 , 9 , 13
2	4 , 9 , 13
2	2 , 9 , 13
3	1 , 9 , 13
3	1 , 3 , 13
13	1 , 1 , 13
	1 , 1 , 13

$$\begin{aligned}\text{L.C.M} &= \text{Product of all prime factors} \\ &= 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 13 \\ &= 1872\end{aligned}$$

So, the smallest number which is exactly divisible by 16,18 and 26 is 1872.

Unit Check 2

1. Encircle the correct options.

- a) (ii) H.C.F b) (I) 10 c) (ii) Product
d) (iii) $2 \times 2 \times 2 \times 2 \times 2$ e) (I) 3,36

2. Find the HCF and LCM of the numbers given using the prime factorization method.

- a) 45, 55

First we find out the prime factors

5	45
3	9
3	3
	1

5	55
11	11
	1

Prime factorization of 45 = $5 \times 3 \times 3$

Prime factorization of 55 = 5×11

Common prime factors = 5

non-common prime factors = 3,3,11

H.C.F = Product of common prime factors of all numbers.

H.C.F = 5

LCM = **Product of common prime factors of 2 or more numbers** $\times$ **Product of non-common prime factors**
= $5 \times 3 \times 3 \times 11$

L.C.M = 495

80, L.C.M of 45 and 55 is 495 and H.C.F of 45 and 55 is 5.

- b) 16, 34

Solution:

First we find out the prime factorization of 16 and 34.

2	16
2	8
2	4
2	2
	1

2	34
17	17
	1

Prime factorization of 16 = $2 \times 2 \times 2 \times 2$

Prime factorization of 34 = 2×17

H.C.F = Product of all common prime factors of all given numbers.

Common factors of 16 and 34 = 2

So, H.C.F = 2

LCM = Product of common prime factors of 2 or more numbers $\times$ Product of non-common prime factors

$$= 2 \times 2 \times 2 \times 17$$

L.C.M = 272

c) 20, 30, 90

Solution:

Prime factorization of 20, 30 and 90

2	20
2	10
5	5
	1

2	30
3	15
5	3
	1

2	90
3	45
5	15
3	3
	1

Prime factorization of 20 = $2 \times 2 \times 5$

Prime factorization of 30 = $2 \times 3 \times 5$

Prime factorization of 90 = $2 \times 3 \times 3 \times 5$

Common prime factors = 2, 3, 5

non-common prime factors = 2, 3

LCM = Product of common prime factors of 2 or more numbers $\times$ Product of non-common prime factors

$$= 2 \times 3 \times 5 \times 2 \times 3$$

$$= 30 \times 6$$

L.C.M = 180

So, L.C.M 20, 30 and 90 = 180

Now, H.C.F is product of common prime factors of all the numbers given.

Common factors of 20, 30 and 90 = 2, 5

Product of common factors = $2 \times 5 = 10$

So, H.C.F of 20, 30 and 90

H.C.F = 10

d) 28, 30, 36

Solution:

Prime factorization of 28, 30 and 36.

2	28
2	14
7	7
	1

2	30
3	15
5	5
	1

2	36
2	18
3	9
3	3
	1

Prime factorization of 28 = $2 \times 2 \times 7$

Prime factorization of 30 = $2 \times 3 \times 5$

Prime factorization of 36 = $2 \times 2 \times 3 \times 3$

common prime factors = $2 \times 2 \times 3$

non-common prime factors = $7 \times 5 \times 3$

LCM = Product of common prime factors of 2 or more numbers $\times$ Product of non-common prime factors

$$= 2 \times 2 \times 3 \quad \times \quad 7 \times 5 \times 3$$

$$= 12 \quad \times \quad 105$$

$$= 1260$$

So, L.C.M 28, 30 and 36 = 180 **L.C.M = 1260**

H.C.F = Product of common prime factors of all given numbers.

$$= 2$$

So, H.C.F of 28, 30 and 36 **H.C.F = 2**

3. Find the HCF and LCM of the numbers given using the division method.

a) 12, 24

Solution:

L.C.M: using division method:

L.C.M of 12 and 24 = Product of all prime factors.

$$= 2 \times 2 \times 2 \times 3$$

$$= 24$$

So, L.C.M = 24

H.C.F: using division method

$$\begin{array}{r} 2 \\ 12 \overline{) 24} \\ \underline{24} \\ 0 \end{array}$$

So, H.C.F of 12 and 24 = 12

2	12 , 24
2	6 , 12
2	3 , 6
3	3 , 3
	1 , 1

b) 11, 22

Solution:

L.C.M: using division method:

$$\begin{array}{r|l} 11 & 11, 22 \\ \hline 2 & 1, 2 \\ \hline & 1, 1 \end{array}$$

$$\begin{aligned} \text{L.C.M} &= \text{Product of all prime factors} \\ &= 11 \times 2 \\ &= 22 \end{aligned}$$

So, L.C.M of 11 and 22 = 22

H.C.F: using division method:

$$\begin{array}{r} 2 \\ 11 \overline{) 22} \\ \underline{- 22} \\ 0 \end{array}$$

So, H.C.F of 11 and 22 is 11.

c) 10, 15, 20

Solution:

L.C.M: using division method:

$$\begin{array}{r|l} 5 & 10, 15, 20 \\ \hline 2 & 2, 3, 4 \\ \hline 2 & 1, 3, 2 \\ \hline 3 & 1, 3, 1 \\ \hline & 1, 1, 1 \end{array}$$

$$\begin{aligned} \text{L.C.M} &= \text{Product of all prime factors} \\ &= 5 \times 2 \times 2 \times 3 = 60 \end{aligned}$$

So, L.C.M of 10, 15 and 20 = 60

H.C.F: using division method

$$\begin{array}{r} 1 \\ 15 \overline{) 20} \\ \underline{- 15} \quad 3 \\ 5 \overline{) 15} \\ \underline{- 15} \\ 0 \end{array}$$

$$\begin{array}{r} 2 \\ 5 \overline{) 10} \\ \underline{- 10} \\ 0 \end{array}$$

(dividing 10 by H.C.F of 15 and 20)

So, H.C.F of 10, 15 and 20 = 5

d) 16, 24, 40

Solution:

L.C.M: using division method:

2	16 , 24 , 40
2	8 , 12 , 20
2	4 , 6 , 10
2	2 , 3 , 5
3	1 , 3 , 5
5	1 , 1 , 5
	1 , 1 , 1

L.C.M = Product of all prime factors

$$= 2 \times 2 \times 2 \times 2 \times 3 \times 5 = 240$$

So, L.C.M of 16, 24 and 40 = 240

H.C.F: using division method

$$\begin{array}{r} 1 \\ 24 \overline{) 40} \\ \underline{-24} \quad 1 \\ 16 \end{array}$$

$$\begin{array}{r} 2 \\ 8 \overline{) 16} \\ \underline{-16} \\ 0 \end{array}$$

(dividing 16 by H.C.F of 24 and 40)

$$\begin{array}{r} 2 \\ -16 \quad 2 \\ 8 \overline{) 16} \\ \underline{-16} \\ 0 \end{array}$$

So, H.C.F of 16, 24 and 40 = 8

4. Find the minimum length of a piece of chain that can be exactly cut into pieces of lengths 35 m, 55 m and 80 m.

Solution:

To find the minimum length, we find the L.C.M of 35, 55 and 80 using division method:

5	35 , 55 , 80
2	7 , 11 , 16
2	7 , 11 , 8
2	7 , 11 , 4
2	7 , 11 , 2
7	7 , 11 , 1
11	1 , 11 , 1
	1 , 1 , 1

So, the minimum length of piece of chain that can be exactly cut into pieces of given lengths = 6160 m

5. The length, width and height of a box is 72 cm, 86 cm and 98 cm respectively. Find the longest tape which can measure the dimensions of the box exactly.

Solution:

To find the longest tape, we find H.C.F of given division method:

$$\begin{array}{r}
 1 \\
 86 \overline{) 98} \\
 \underline{-86} \quad 7 \\
 12 \overline{) 86} \\
 \underline{-84} \quad 6 \\
 2 \overline{) 12} \\
 \underline{-12} \quad 0 \quad \text{(H.C.F of 86 and 98)}
 \end{array}
 \qquad
 \begin{array}{r}
 36 \\
 2 \overline{) 73} \\
 \underline{-6} \\
 12 \\
 \underline{-12} \quad 0 \quad \text{(dividing 72 by H.C.F of 86 and 98)}
 \end{array}$$

So, the H.C.F of 72 cm , 86 cm , 98 cm is 2 cm.

6. Find the greatest number which exactly divides 40, 45 and 65.

To find the greatest number, we find the H.C.F of given numbers

Using prime factorization method:

5	40	5	45	5	65
2	8	3	9	13	13
2	4	3	3		1
2	2		1		
	1				

Prime factorization of 40 = $5 \times 2 \times 2 \times 2$

Prime factorization of 45 = $5 \times 3 \times 3$

Prime factorization of 65 = 5×13

Common prime factor of 40, 45 and 65 = 5

So, the greatest number which exactly divides these numbers is 5.

Unit 3: Fractions

Unit Check 3.1

1. Add the following.

a) $\frac{7}{2} + \frac{1}{7}$

Solution:

L.C.M of 2 and 7 is 14

$$\frac{7}{2} = \frac{7 \times 7}{2 \times 7} = \frac{49}{14}, \quad \frac{1}{7} = \frac{1 \times 2}{7 \times 2} = \frac{2}{14}$$

$$\frac{7}{2} + \frac{1}{7} = \frac{49}{14} + \frac{2}{14} = \frac{49+2}{14} = \frac{51}{14}$$

Converting it into nixed fraction: $14 \overline{) 51} = 3 \frac{9}{14}$

b) $3\frac{1}{4} + 2\frac{1}{3}$

Solution:

$$3\frac{1}{4} = \frac{13}{4} = \frac{13 \times 3}{4 \times 3} = \frac{39}{12}, \quad 2\frac{1}{3} = \frac{7}{3} = \frac{7 \times 4}{3 \times 4} = \frac{28}{12}$$

$$3\frac{1}{4} + 2\frac{1}{3} = \frac{13}{4} + \frac{7}{3} = \frac{39}{12} + \frac{28}{12} = \frac{39+28}{12} = \frac{67}{12} = 5\frac{7}{12}$$

c) $\frac{1}{2} + \frac{3}{8}$

Solution:

$$\frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}, \quad \frac{3}{8} = \frac{3 \times 1}{8 \times 1} = \frac{3}{8}$$

Now, $\frac{1}{2} + \frac{3}{8} = \frac{4}{8} + \frac{3}{8} = \frac{4+3}{8} = \frac{7}{8}$

d) $1\frac{1}{4} + 3\frac{2}{3}$

Solution:

$$1\frac{1}{4} = \frac{5}{4} = \frac{5 \times 3}{4 \times 3} = \frac{15}{12}, \quad 3\frac{2}{3} = \frac{11}{3} = \frac{11 \times 4}{3 \times 4} = \frac{44}{12}$$

Note

to add unlike fractions, First we convert them into like fractions with same denominators, by finding the LCM of denominators.

$$\begin{aligned}\text{Now, } 1\frac{1}{4} + 3\frac{2}{3} &= \frac{5}{4} + \frac{11}{3} \\ &= \frac{15}{12} + \frac{44}{12} \\ &= \frac{15+44}{12} \\ &= \frac{59}{12} = 4\frac{11}{12}\end{aligned}$$

e) $4\frac{1}{12} + \frac{1}{9}$

Solution:

$$4\frac{1}{12} = \frac{49}{12} = \frac{49 \times 3}{12 \times 3} = \frac{147}{36} \quad \frac{1}{9} = \frac{1 \times 4}{9 \times 4} = \frac{4}{36}$$

$$\begin{aligned}4\frac{1}{12} + \frac{1}{9} &= \frac{49}{12} + \frac{1}{9} \\ &= \frac{147}{36} + \frac{4}{36} \\ &= \frac{151}{36} \\ &= 4\frac{7}{36}\end{aligned}$$

f) $4\frac{1}{5} + 3\frac{3}{11}$

Solution:

$$4\frac{1}{5} = \frac{21}{5} = \frac{21 \times 11}{5 \times 11} = \frac{231}{55}, \quad 3\frac{3}{11} = \frac{36}{11} = \frac{36 \times 5}{11 \times 5} = \frac{180}{55}$$

Now:

$$\begin{aligned}4\frac{1}{5} + 3\frac{3}{11} &= \frac{21}{5} + \frac{36}{11} \\ &= \frac{231}{55} + \frac{180}{55} \\ &= \frac{411}{55} \\ &= 7\frac{26}{55}\end{aligned}$$

g) $\frac{1}{5} + \frac{5}{7}$

Solution:

$$\frac{1}{5} = \frac{1 \times 7}{5 \times 7} = \frac{7}{35} \quad \frac{5}{7} = \frac{5 \times 5}{7 \times 5} = \frac{25}{35}$$

Now:

$$\begin{aligned}\frac{1}{5} + \frac{5}{7} &= \frac{7}{35} + \frac{25}{35} \\ &= \frac{7+25}{35} = \frac{32}{35}\end{aligned}$$

h) $\frac{7}{9} + \frac{1}{3} + 3\frac{5}{6}$

Solution:

$$\frac{7}{9} = \frac{7 \times 2}{9 \times 2} = \frac{14}{18}, \quad \frac{1}{3} = \frac{1 \times 6}{3 \times 6} = \frac{6}{18}, \quad 3\frac{5}{6} = \frac{23}{6} = \frac{23 \times 3}{6 \times 3} = \frac{69}{18}$$

Now:

$$\begin{aligned}\frac{7}{9} + \frac{1}{3} + 3\frac{5}{6} &= \frac{7}{9} + \frac{1}{3} + \frac{23}{6} \\ &= \frac{14}{18} + \frac{6}{18} + \frac{69}{18} = \frac{14+6+69}{18} \\ &= \frac{89}{18} \\ &= 4\frac{17}{18}\end{aligned}$$

i) $2\frac{3}{5} + 6\frac{5}{6} + 3\frac{1}{6}$

Solution:

$$2\frac{3}{5} = \frac{13}{5} = \frac{13 \times 6}{5 \times 6} = \frac{78}{30},$$

$$6\frac{5}{6} = \frac{41}{6} = \frac{41 \times 5}{6 \times 5} = \frac{205}{30},$$

$$3\frac{1}{6} = \frac{19}{6} = \frac{19 \times 5}{6 \times 5} = \frac{95}{30}$$

Now:

$$\begin{aligned}2\frac{3}{5} + 6\frac{5}{6} + 3\frac{1}{6} &= \frac{78}{30} + \frac{205}{30} + \frac{95}{30} \\ &= \frac{78}{30} + \frac{205}{30} + \frac{95}{30} \\ &= \frac{378}{30} \quad (\text{Dividing by 6}) \\ &= 12\frac{3}{5}\end{aligned}$$

2. Subtract the following.

As done in addition, we First convert mixed fraction, if any, to proper fraction. Then we make the denominators of all fraction same by finding out the L.C.M of denominators and then we continue with the calculations.

a) $\frac{1}{2} - \frac{1}{5}$

Solution:

$$\frac{1}{2} = \frac{1 \times 5}{2 \times 5} = \frac{5}{10}, \quad \frac{1}{5} = \frac{1 \times 2}{5 \times 2} = \frac{2}{10}$$

Now:

$$\begin{aligned} \frac{1}{2} - \frac{1}{5} &= \frac{5}{10} - \frac{2}{10} \\ &= \frac{5-2}{10} = \frac{3}{10} \end{aligned}$$

b) $1\frac{1}{2} - 1\frac{1}{10}$

Solution:

$$1\frac{1}{2} = \frac{3}{2} = \frac{3 \times 5}{2 \times 5} = \frac{15}{10}, \quad 1\frac{1}{10} = \frac{11}{10} = \frac{11 \times 1}{10 \times 1} = \frac{11}{10}$$

Now:

$$\begin{aligned} 1\frac{1}{2} - 1\frac{1}{10} &= \frac{3}{2} - \frac{11}{10} \\ &= \frac{15}{10} - \frac{11}{10} \\ &= \frac{15-11}{10} = \frac{4}{10} = \frac{2}{5} \end{aligned}$$

c) $\frac{5}{6} - \frac{2}{4}$

Solution:

$$\frac{5}{6} = \frac{5 \times 2}{6 \times 2} = \frac{10}{12}, \quad \frac{2}{4} = \frac{2 \times 3}{4 \times 3} = \frac{6}{12},$$

Now:

$$\frac{5}{6} - \frac{2}{4} = \frac{10}{12} - \frac{6}{12} = \frac{4}{12} = \frac{1}{3}$$

d) $\frac{9}{8} - \frac{1}{3} - \text{---}$

Solution:

$$\frac{9}{8} = \frac{9 \times 3}{8 \times 3} = \frac{27}{24}, \quad \frac{1}{3} = \frac{1 \times 8}{3 \times 8} = \frac{8}{24},$$

Now:

$$\begin{aligned}\frac{9}{8} - \frac{1}{3} &= \frac{27}{24} - \frac{8}{24} \\ &= \frac{19}{24}\end{aligned}$$

e) $2\frac{2}{3} - 2\frac{1}{4}$

Solution:

$$2\frac{2}{3} = \frac{8}{3} = \frac{8 \times 4}{3 \times 4} = \frac{32}{12}, \quad 2\frac{1}{4} = \frac{9}{4} = \frac{9 \times 3}{4 \times 3} = \frac{27}{12}$$

Now:

$$\begin{aligned}2\frac{2}{3} - 2\frac{1}{4} &= \frac{32}{12} - \frac{27}{12} \\ &= \frac{5}{12}\end{aligned}$$

f) $\frac{3}{4} - \frac{2}{5}$

Solution:

$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \frac{15}{20}, \quad \frac{2}{5} = \frac{2 \times 4}{5 \times 4} = \frac{8}{20}$$

Now:

$$\begin{aligned}\frac{3}{4} - \frac{2}{5} &= \frac{15}{20} - \frac{8}{20} \\ &= \frac{7}{20}\end{aligned}$$

g) $3\frac{3}{12} - \frac{7}{6}$

Solution:

$$3\frac{3}{12} = \frac{39}{12} = \frac{39 \times 1}{12 \times 1} = \frac{39}{12}, \quad \frac{7}{6} = \frac{7 \times 2}{6 \times 2} = \frac{14}{12}$$

Now:

$$\begin{aligned}3\frac{3}{12} - \frac{7}{6} &= \frac{39}{12} - \frac{14}{12} \\ &= \frac{39 - 14}{12} = \frac{25}{12} \\ &= 2\frac{1}{12}\end{aligned}$$

h) $1\frac{9}{10} - \frac{5}{7}$

Solution:

$$1\frac{9}{10} = \frac{19}{10} = \frac{19 \times 7}{10 \times 7} = \frac{133}{70}, \quad \frac{5}{7} = \frac{5 \times 10}{7 \times 10} = \frac{50}{70}$$

Now:

$$\begin{aligned} 1\frac{9}{10} - \frac{5}{7} &= \frac{19}{10} - \frac{5}{7} \\ &= \frac{133}{70} - \frac{50}{70} \\ &= \frac{83}{70} = 1\frac{13}{70} \end{aligned}$$

l) $7\frac{1}{8} - 3\frac{1}{2}$

Solution:

$$7\frac{1}{8} = \frac{57}{8} = \frac{57 \times 1}{8 \times 1} = \frac{57}{8}, \quad 3\frac{1}{2} = \frac{7}{2} = \frac{7 \times 4}{2 \times 4} = \frac{28}{8}$$

Now:

$$\begin{aligned} 7\frac{1}{8} - 3\frac{1}{2} &= \frac{57}{8} - \frac{28}{8} \\ &= \frac{29}{8} = 3\frac{5}{8} \end{aligned}$$

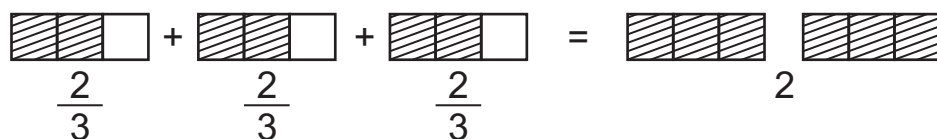
Learning Check 3.2

2. Multiply the following and represent using figures.

a) $\frac{2}{3} \times 3$

Solution:

$$\frac{2}{3} \times 3 = \frac{2 \times 3}{3} = \frac{\cancel{2}^2 \times \cancel{3}_1}{\cancel{3}_1} = 2 \text{ Answer}$$



b) $\frac{1}{4} \times 7$

Solution:

$$\frac{1}{4} \times 7 = \frac{1 \times 7}{4} = \frac{7}{4} = 1\frac{3}{4} \text{ Answer}$$

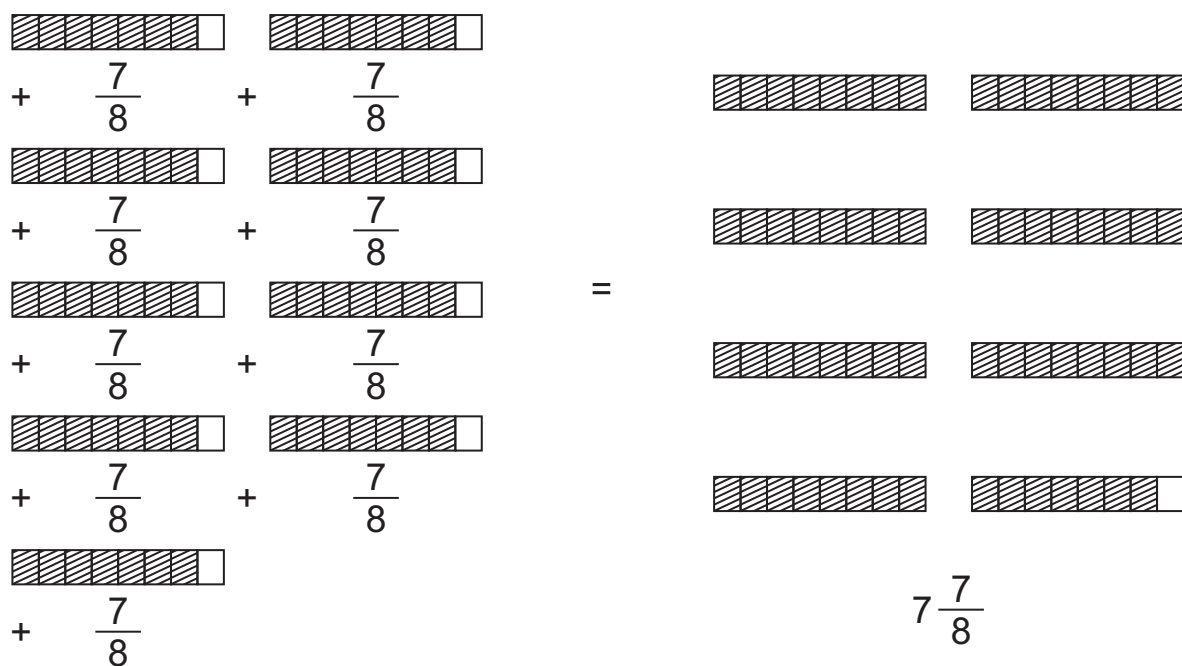
$$\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{7}{4}$$

c) $\frac{7}{8} \times 9$

Solution:

$$\frac{7}{8} \times 9 = \frac{7 \times 9}{8} = \frac{63}{8} = 7 \frac{7}{8}$$

Using Figures

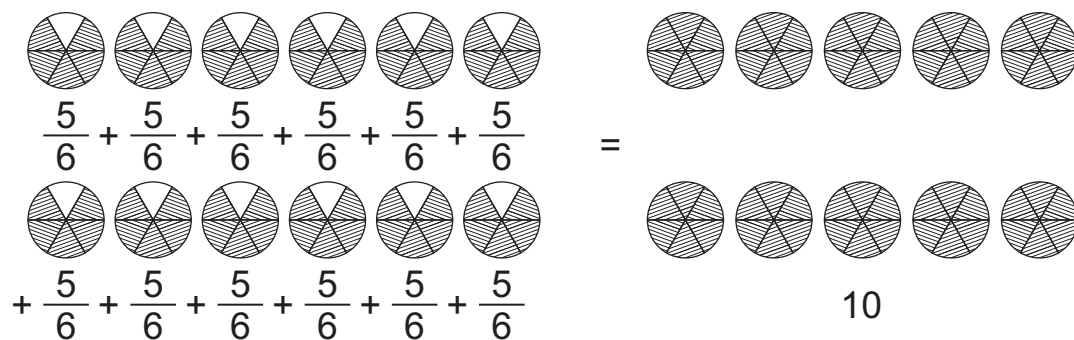


d) $\frac{5}{6} \times 12$

Solution:

$$\frac{5}{6} \times 12 = \frac{5 \times 12}{6} = \frac{5 \times 2}{1} = 10$$

In Figures



e) $\frac{3}{5} \times 5$

Solution:

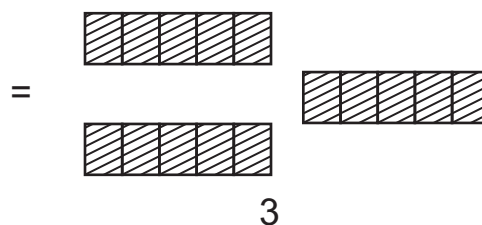
$$\frac{3}{5} \times 5 = \frac{3 \times 5}{5} = \frac{15}{\cancel{5}_1} = 3$$



$$\frac{3}{5} + \frac{3}{5} + \frac{3}{5}$$



$$+ \frac{3}{5} + \frac{3}{5}$$



3

f) $\frac{3}{6} \times 10$

Solution:

$$\frac{3}{6} \times 10 = \frac{3 \times 10}{6} = \frac{30}{\cancel{6}_2} = 5$$

Using Figures



$$\frac{3}{6} + \frac{3}{6} + \frac{3}{6}$$



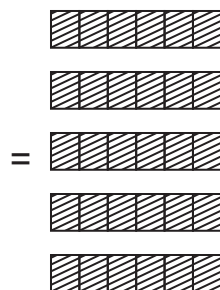
$$+ \frac{3}{6} + \frac{3}{6} + \frac{3}{6}$$



$$+ \frac{3}{6} + \frac{3}{6} + \frac{3}{6}$$



$$+ \frac{3}{6}$$



5

g) $\frac{6}{14} \times 7$

Solution:

$$\frac{6}{14} \times 7 = \frac{6 \times 7}{14} = \frac{42}{\cancel{7}_2} = 3$$

Using Figures



$$\frac{6}{14}$$

+



$$\frac{6}{14}$$



$$+ \frac{6}{14}$$



$$+ \frac{6}{14}$$



$$+ \frac{6}{14}$$



$$+ \frac{6}{14}$$



$$+ \frac{6}{14}$$



$$+ \frac{6}{14}$$



=



3

h) $\frac{5}{9} \times 3$

Solution:

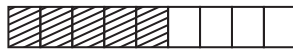
$$\frac{5}{9} \times 3 = \frac{5 \times 3}{\cancel{9}_3} = \frac{5}{3}$$

$$= \frac{5}{3} = 1 \frac{2}{3}$$

Using Figures



$$+ \frac{5}{9} + \frac{5}{9} +$$



$$+ \frac{5}{9}$$

$$= \begin{array}{|c|c|c|c|c|c|c|c|c|} \hline \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} & \text{shaded} \\ \hline \end{array} 1 \frac{2}{3}$$

2. Solve the following.

a) $4\frac{4}{5} \times \frac{1}{3}$

Solution:

$$4\frac{4}{5} \times \frac{1}{3} = \frac{24}{5} \times \frac{1}{3}$$

$$= \frac{\overset{8}{\cancel{24}} \times 1}{5 \times \cancel{3}_1}$$

$$= \frac{8 \times 1}{5 \times 1}$$

$$= \frac{8}{5}$$

$$= 1 \frac{3}{5}$$

b) $\frac{4}{5} \times \frac{1}{3}$

Solution:

$$\frac{4}{5} \times \frac{1}{3} = \frac{4 \times 1}{5 \times 3}$$

$$= \frac{4}{15}$$

$$c) \frac{2}{5} \times 3\frac{2}{7}$$

Solution:

$$\begin{aligned} \frac{2}{5} \times 3\frac{2}{7} &= \frac{2}{5} \times \frac{23}{7} \\ &= \frac{2 \times 23}{5 \times 7} \\ &= \frac{46}{35} \\ &= 1\frac{11}{35} \end{aligned}$$

$$d) \frac{1}{2} \times \frac{4}{7}$$

Solution:

$$\begin{aligned} \frac{1}{2} \times \frac{4}{7} &= \frac{1}{2} \times \frac{4}{7} \\ &= \frac{1 \times \cancel{4}_2}{\cancel{2}_1 \times 7} \\ &= \frac{1 \times 2}{1 \times 7} \\ &= \frac{2}{7} \end{aligned}$$

$$e) 2\frac{7}{10} \times \frac{3}{11}$$

Solution:

$$\begin{aligned} 2\frac{7}{10} \times \frac{3}{11} &= 2\frac{7}{10} \times \frac{3}{11} \\ &= \frac{27}{10} \times \frac{3}{11} \\ &= \frac{27 \times 3}{10 \times 11} \\ &= \frac{81}{110} \end{aligned}$$

$$f) 5\frac{3}{7} \times 3\frac{1}{8}$$

Solution:

$$\begin{aligned} 5\frac{3}{7} \times 3\frac{1}{8} &= 5\frac{3}{7} \times 3\frac{1}{8} \\ &= \frac{38}{7} \times \frac{25}{8} \\ &= \frac{19 \times 25}{7 \times 4} \\ &= \frac{475}{28} \\ &= 16\frac{27}{28} \end{aligned}$$

$$g) \frac{2}{9} \times \frac{3}{10}$$

Solution:

$$\begin{aligned} \frac{2}{9} \times \frac{3}{10} &= \frac{2}{9} \times \frac{3}{10} \\ &= \frac{\cancel{2}^1 \times \cancel{3}_3}{\cancel{9}_3 \times 10} \\ &= \frac{1 \times 1}{3 \times 5} \\ &= \frac{13}{15} \end{aligned}$$

$$h) \frac{5}{2} \times \frac{3}{7}$$

Solution:

$$\begin{aligned} \frac{5}{2} \times \frac{3}{7} &= \frac{5}{2} \times \frac{3}{7} \\ &= \frac{5 \times 3}{2 \times 7} \\ &= \frac{15}{14} \\ &= 1\frac{1}{14} \end{aligned}$$

$$\text{i) } 1\frac{1}{5} \times \frac{7}{10}$$

Solution:

$$\begin{aligned} 1\frac{1}{5} \times \frac{7}{10} &= 1\frac{1}{5} \times \frac{7}{10} \\ &= \frac{\cancel{3}^6}{5} \times \frac{7}{\cancel{10}_5} \\ &= \frac{3 \times 7}{5 \times 5} \\ &= \frac{24}{25} \end{aligned}$$

$$\text{j) } 4\frac{2}{5} \times 5\frac{2}{3}$$

Solution:

$$\begin{aligned} 4\frac{2}{5} \times 5\frac{2}{3} &= 4\frac{2}{5} \times 5\frac{2}{3} \\ &= \frac{22}{5} \times \frac{17}{3} \\ &= \frac{22 \times 17}{5 \times 3} \\ &= \frac{374}{15} \\ &= 24\frac{14}{15} \end{aligned}$$

$$\text{k) } \frac{7}{12} \times \frac{3}{7}$$

Solution:

$$\begin{aligned} \frac{7}{12} \times \frac{3}{7} &= \frac{7}{12} \times \frac{3}{7} \\ &= \frac{\cancel{7}^1 \times \cancel{3}_1}{\cancel{12}_4 \times \cancel{7}_1} \\ &= \frac{1 \times 1}{4 \times 1} \\ &= \frac{1}{4} \quad \text{Answer} \end{aligned}$$

$$\text{l) } \frac{6}{10} \times 2\frac{4}{9}$$

Solution:

$$\begin{aligned} \frac{6}{10} \times 2\frac{4}{9} &= \frac{6}{10} \times 2\frac{4}{9} \\ &= \frac{6}{10} \times \frac{22}{9} \\ &= \frac{\cancel{6}^2 \times \cancel{22}_{11}}{\cancel{10}_5 \times \cancel{9}_3} \\ &= \frac{2 \times 11}{5 \times 3} \\ &= \frac{22}{15} \\ &= 1\frac{7}{15} \end{aligned}$$

3- A can of condensed milk contains $7\frac{1}{2}$ ℓ of milk.

How much milk will there be in 9 such cans?

Solution:

$$\text{milk in one can} = 7\frac{1}{2} \ell$$

$$\begin{aligned} \text{milk in 9 cans} &= 7\frac{1}{2} \times 9 \\ &= \frac{15}{2} \times 9 \\ &= \frac{15 \times 9}{2} \\ &= \frac{135}{2} \\ &= 67\frac{1}{2} \end{aligned}$$

So, there will be $67\frac{1}{2}$ liters of milk in 9 such cans.

4- A bag of pulses weighs $4\frac{1}{2}$ kg. What will be the mass of 7 such bags?

Solution:

$$\text{Weight of one bag of pulses} = 4\frac{1}{2} \text{ kg}$$

$$\text{Number of bags} = 7$$

$$\text{Weight of 7 bags} = 4\frac{1}{2} \times 7$$

$$= \frac{9}{2} \times 7$$

$$= \frac{9 \times 7}{2}$$

$$= \frac{63}{2}$$

$$= 31\frac{1}{2}$$

So, the weight of 7 bags of pulses will be $31\frac{1}{2}$ kg.

**5- Ahad reads $\frac{1}{2}$ page of a storybook in an hour.
How many pages will he read in $12\frac{1}{2}$ hours?**

Solution:

$$\text{Ahad reads in one hour} = \frac{1}{2}$$

$$\text{Number of hours} = 12\frac{1}{2}$$

$$\text{Ahad will read} = 12\frac{1}{2} = \frac{1}{2} \times 12\frac{1}{2}$$

$$= \frac{1}{2} \times \frac{25}{2}$$

$$= \frac{1 \times 25}{2 \times 2}$$

$$= \frac{25}{4}$$

$$= 6\frac{1}{4}$$

So, Ahad will read $6\frac{1}{4}$ pages of story book in $12\frac{1}{2}$ hours.

6- Sehrish has $\frac{4}{9}$ of a pancake left. She gave $\frac{2}{3}$ of it to her brother. What part of the whole pancake did her brother get?

Solution:

$$\begin{aligned}\text{Pancake left with sehrish} &= \frac{4}{9} \\ \text{She gave to her brother} &= \frac{2}{3} \text{ of } \frac{4}{9} \\ &= \frac{2}{3} \times \frac{4}{9} \\ &= \frac{2 \times 4}{3 \times 9} \\ &= \frac{8}{27}\end{aligned}$$

So, her brother will get $\frac{8}{27}$ of the whole pancake.

7- In a grade 5 class, $\frac{2}{3}$ of the students are girls. If there are 30 students in the class, then:

Solution:

$$\text{Total number of students} = 30$$

$$\text{Fraction of girls} = \frac{2}{3}$$

(a) Solution:

$$\begin{aligned}\text{number of girls} &= \frac{2}{3} \times 30 \\ &= \frac{2 \times \overset{10}{\cancel{30}}}{\cancel{3}_1} \\ &= \frac{2 \times 10}{1} \\ &= 20\end{aligned}$$

So, there are 20 girls in the class.

(b) Solution:

$$\text{Total number of students} = 30$$

$$\text{number of girls} = 20$$

$$\begin{aligned}\text{So number of boys} &= 30 - 20 \\ &= 10\end{aligned}$$

So, there are 10 boys in the class.

Learning Check 3.3

1. Find the reciprocal of the following.

a) $\frac{4}{7}$

reciprocal = $\frac{7}{4}$

b) $\frac{9}{11}$

reciprocal = $\frac{11}{9}$

c) $\frac{6}{13}$

reciprocal = $\frac{13}{6}$

d) $\frac{1}{10}$

reciprocal = $\frac{10}{1}$ or 10

e) $\frac{12}{7}$

reciprocal = $\frac{7}{12}$

f) $\frac{20}{19}$

reciprocal = $\frac{19}{20}$

2. Solve the following and convert the answer to its simplest form.

a) $\frac{4}{5} \div \frac{1}{4}$

Solution:

$$= \frac{4}{5} \div \frac{1}{4}$$

$$= \frac{4}{5} \times \frac{4}{1}$$

$$= \frac{4 \times 4}{5}$$

$$= \frac{16}{5}$$

$$= 3\frac{1}{5}$$

b) $\frac{10}{11} \div \frac{7}{8}$

Solution:

$$= \frac{10}{11} \div \frac{7}{8}$$

$$= \frac{10}{11} \times \frac{8}{7}$$

$$= \frac{10 \times 8}{11 \times 7}$$

$$= \frac{80}{77}$$

$$= 1\frac{3}{77}$$

c) $\frac{6}{7} \div \frac{3}{7}$

Solution:

$$= \frac{6}{7} \div \frac{3}{7}$$

$$= \frac{\overset{2}{\cancel{6}}}{\underset{1}{\cancel{7}}} \times \frac{\overset{1}{\cancel{7}}}{\underset{3}{\cancel{3}}}$$

$$= \frac{2 \times 1}{1 \times 1}$$

$$= 2$$

d) $\frac{1}{6} \div \frac{8}{9}$

Solution:

$$= \frac{1}{6} \div \frac{8}{9}$$

$$= \frac{1}{\overset{2}{\cancel{6}}} \times \frac{\overset{3}{\cancel{9}}}{8}$$

$$= \frac{1 \times 3}{2 \times 8}$$

$$= \frac{3}{16}$$

e) $5\frac{1}{5} \div \frac{5}{9}$

Solution:

$$= 5\frac{1}{5} \div \frac{5}{9}$$

$$= \frac{26}{5} \div \frac{5}{9}$$

$$= \frac{26}{5} \times \frac{9}{5}$$

$$= \frac{234}{25}$$

$$= 9\frac{9}{25}$$

f) $3\frac{1}{8} \div \frac{5}{6}$

Solution:

$$= 3\frac{1}{8} \div \frac{5}{6}$$

$$= \frac{25}{8} \div \frac{5}{6}$$

$$= \frac{\overset{5}{\cancel{25}}}{8} \times \frac{\overset{1}{\cancel{6}}}{\underset{5}{\cancel{5}}}$$

$$= \frac{30}{8}$$

$$= 3\frac{3}{8}$$

$$\text{g) } 3\frac{1}{9} \div 1\frac{3}{4}$$

Solution:

$$\begin{aligned} &= 3\frac{1}{9} \div 1\frac{3}{4} \\ &= \frac{28}{9} \div \frac{7}{4} \\ &= \frac{\overset{④}{\cancel{28}}}{9} \times \frac{4}{\underset{①}{\cancel{7}}} \\ &= \frac{16}{9} \\ &= 1\frac{7}{9} \end{aligned}$$

$$\text{h) } 10\frac{1}{9} \div 4\frac{1}{6}$$

Solution:

$$\begin{aligned} &= 10\frac{1}{9} \div 4\frac{1}{6} \\ &= \frac{91}{9} \div \frac{25}{6} \\ &= \frac{\overset{③}{\cancel{91}}}{9} \times \frac{\overset{②}{\cancel{6}}}{25} \\ &= \frac{182}{75} \\ &= 2\frac{35}{75} \end{aligned}$$

3. $4\frac{1}{2}$ liters of strawberry juice is to be put equally into glasses of $\frac{1}{4}$ liters each. Find the number of glasses which can be filled by the strawberry juice.

Solution:

$$\text{Volume of strawberry juice} = 4\frac{1}{2} \text{ litres}$$

$$\text{Capacity of one glass} = \frac{1}{4} \text{ litres}$$

$$\begin{aligned} \text{Number of glasses that can be filled} &= 4\frac{1}{2} \div \frac{1}{4} \\ &= \frac{9}{2} \div \frac{1}{4} \\ &= \frac{9}{2} \times \frac{4}{1} \\ &= \frac{9 \times 4}{2} \\ &= \frac{\overset{②}{\cancel{9}} \times \overset{①}{\cancel{4}}}{2} \\ &= 9 \times 2 \\ &= 18 \end{aligned}$$

So, 18 glasses will be filled by the strawberry juice.

4. A tailor has a $10\frac{1}{2}$ meters long piece of fabric. He cuts it into pieces of $1\frac{1}{2}$ meters. Find the total number of pieces he will get.

Solution:

$$\text{Length of the piece of fabric} = 10\frac{1}{2} \text{ meters}$$

$$\text{Length of small pieces} = 1\frac{1}{2} \text{ meters}$$

$$\begin{aligned} \text{number of pieces the tailor will get} &= 10\frac{1}{2} \div 1\frac{1}{2} \\ &= \frac{21}{2} \div \frac{3}{2} \\ &= \frac{21}{2} \times \frac{2}{3} \\ &= \frac{\overset{⑦}{2}\cancel{1} \times \overset{①}{2}}{\underset{①}{\cancel{2}} \times \overset{①}{3}} \\ &= 7 \times 1 \\ &= 7 \end{aligned}$$

So, he will get 7 pieces.

5. Marwa read $4\frac{1}{2}$ pages of a book in $1\frac{1}{2}$ hours. How many pages will she read in 1 hour?

Solution:

$$\text{Marwa read pages} = 4\frac{1}{2}$$

$$\text{Time taken by Marwa} = 1\frac{1}{2} \text{ hours}$$

$$\begin{aligned} \text{She will read in one hour} &= 4\frac{1}{2} \div 1\frac{1}{2} \\ &= \frac{9}{2} \div \frac{3}{2} \\ &= \frac{9}{2} \times \frac{2}{3} \\ &= \frac{\overset{③}{9} \times \overset{①}{2}}{\underset{①}{\cancel{2}} \times \overset{①}{3}} \\ &= \frac{3}{1} \\ &= 3 \text{ Pages} \end{aligned}$$

So, Marwa will read 3 pages in one hour.

6. There is $16\frac{1}{2}$ kg of meat which is to be packed in bags of $\frac{7}{8}$ kg each.
How many bags will be packed?

Solution:

$$\text{Total quantity of meat} = 16\frac{1}{2} \text{ kg}$$

$$\text{Capacity of each bag} = \frac{7}{8} \text{ kg}$$

$$\begin{aligned} \text{Number of bags that can be packed} &= 16\frac{1}{2} \div \frac{7}{8} \\ &= \frac{33}{2} \div \frac{7}{8} \\ &= \frac{33}{\cancel{2}^1} \times \frac{8^4}{7} \\ &= \frac{33 \times 4}{7} \\ &= \frac{132}{7} \\ &= 18\frac{6}{7} \end{aligned}$$

So, $18\frac{6}{7}$ bags will be packed.

7. Anas completed $3\frac{1}{6}$ rounds of a jogging track and covered a total distance of $5\frac{1}{3}$ km. Find the distance he covered in 1 round.

Solution:

$$\text{Distance covered by Anas} = 5\frac{1}{3} \text{ km}$$

$$\text{Number of rounds completed by him} = 3\frac{1}{6}$$

$$\begin{aligned} \text{Distance covered in one round} &= 5\frac{1}{3} \div 3\frac{1}{6} \\ &= \frac{16}{3} \div \frac{19}{6} \\ &= \frac{16}{\cancel{3}^1} \times \frac{6^2}{19} \\ &= \frac{16 \times 2}{19} \\ &= \frac{32}{19} \\ &= 1\frac{13}{19} \end{aligned}$$

So, he covered $1\frac{13}{19}$ km in one hour.

Unit Check 3

1. Encircle the option:

a) (iii) $\frac{11}{5}$

b) (iv) $\frac{7}{15}$

c) (ii) 3

d) (iv) $\frac{3}{10}$

e) (ii) $\frac{3}{2}$

2. Solve the following and write the answer in its simplest form.

a) $3\frac{1}{2} + \frac{2}{3}$

Solution:

$$\begin{aligned} &= 3\frac{1}{2} + \frac{2}{3} \\ &= \frac{7}{2} + \frac{2}{3} \\ &= \frac{21}{6} + \frac{4}{6} \\ &= \frac{21+4}{6} \\ &= \frac{25}{6} \\ &= 4\frac{1}{6} \end{aligned}$$

$$\frac{7 \times 3}{2 \times 3} = \frac{21}{6}$$

$$\frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

To get same denominator

b) $2\frac{1}{6} + \frac{3}{4} + \frac{1}{7}$

Solution:

$$\begin{aligned} &2\frac{1}{6} + \frac{3}{4} + \frac{1}{7} \\ &= \frac{13}{6} + \frac{3}{4} + \frac{1}{7} \\ &= \frac{182}{84} + \frac{63}{84} + \frac{12}{84} \\ &= \frac{182+63+12}{84} \\ &= \frac{257}{84} \\ &= 3\frac{5}{84} \end{aligned}$$

c) $\frac{1}{11} + \frac{4}{9}$

Solution:

$$\begin{aligned} &= \frac{1}{11} + \frac{4}{9} \\ &= \frac{9}{99} + \frac{44}{99} \\ &= \frac{9+44}{99} \\ &= \frac{53}{99} \end{aligned}$$

d) $\frac{7}{6} - \frac{2}{3}$

Solution:

$$\begin{aligned} &= \frac{7}{6} - \frac{2}{3} \\ &= \frac{7}{6} - \frac{4}{6} \\ &= \frac{7-4}{6} \\ &= \frac{3}{6} \\ &= \frac{1}{2} \end{aligned}$$

e) $5\frac{1}{3} - 3\frac{3}{7}$

Solution:

$$\begin{aligned} &= 5\frac{1}{3} - 3\frac{3}{7} = \frac{16}{3} - \frac{24}{7} \\ &= \frac{112}{21} - \frac{72}{21} \\ &= \frac{112-72}{21} \\ &= \frac{40}{21} \\ &= 1\frac{19}{21} \end{aligned}$$

$$f) \frac{12}{13} - \frac{1}{8}$$

Solution:

$$\begin{aligned} &= \frac{12}{13} - \frac{1}{8} \\ &= \frac{96}{104} - \frac{13}{104} \\ &= \frac{96-13}{104} \\ &= \frac{83}{104} \end{aligned}$$

$$g) \frac{1}{5} \times \frac{3}{2}$$

Solution:

$$\begin{aligned} &= \frac{1}{5} \times \frac{3}{2} \\ &= \frac{1 \times 3}{5 \times 2} \\ &= \frac{3}{10} \end{aligned}$$

$$h) 5\frac{3}{2} - 5\frac{1}{2}$$

Solution:

$$\begin{aligned} &= 5\frac{3}{2} - 5\frac{1}{2} \\ &= \frac{13}{2} - \frac{11}{2} \\ &= \frac{13-11}{2} \\ &= \frac{2}{2} \\ &= 1 \end{aligned}$$

$$i) 4\frac{1}{3} \times \frac{1}{8}$$

Solution:

$$\begin{aligned} &= 4\frac{1}{3} \times \frac{1}{8} \\ &= \frac{13}{3} \times \frac{1}{8} \\ &= \frac{13 \times 1}{3 \times 8} \\ &= \frac{13}{24} \text{ Answer} \end{aligned}$$

$$j) \frac{1}{5} \div \frac{2}{10}$$

Solution:

$$\begin{aligned} &= \frac{1}{5} \div \frac{2}{10} \\ &= \frac{1}{5} \times \frac{10}{2} \\ &= \frac{1}{\cancel{5}^{\textcircled{1}}} \times \frac{\cancel{10}^{\textcircled{2}}}{2} \\ &= \frac{1 \times \cancel{2}^{\textcircled{1}}}{1 \times \cancel{2}^{\textcircled{2}}} \\ &= 1 \end{aligned}$$

$$k) 4\frac{2}{3} \div \frac{7}{9}$$

Solution:

$$\begin{aligned} &= 4\frac{2}{3} \div \frac{7}{9} \\ &= \frac{14}{3} \times \frac{9}{7} \\ &= \frac{\textcircled{2}14}{\textcircled{1}3} \times \frac{\textcircled{3}9}{\textcircled{1}7} \\ &= \frac{2}{1} \times \frac{3}{1} \\ &= 2 \times 3 \\ &= 6 \end{aligned}$$

$$l) 1\frac{1}{6} \div 2\frac{2}{7}$$

Solution:

$$\begin{aligned} &= 1\frac{1}{6} \div 2\frac{2}{7} \\ &= \frac{7}{6} \div \frac{14}{7} \\ &= \frac{\textcircled{1}7}{\textcircled{1}6} \times \frac{\textcircled{1}6}{14\textcircled{2}} \\ &= \frac{1 \times 1}{1 \times 2} \end{aligned}$$

3. The length of a rod is $15\frac{1}{8}$ m. What will be the length of 8 such rods?

Solution:

$$\text{Length of one rod} = 15\frac{1}{8} \text{ m}$$

$$\text{Number of rods} = 8$$

$$\begin{aligned}\text{Length of 8 rods} &= 15\frac{1}{8} \times 8 \\ &= \frac{121}{\cancel{8}^{\textcircled{1}}} \times \cancel{8}^{\textcircled{1}} = 121\end{aligned}$$

So, the length of 8 rods will be 121 m.

4. Sidra had $3\frac{1}{4}$ sandwiches. She gave $1\frac{1}{2}$ of the sandwiches to her sister. What fraction of the sandwiches did her sister get?

Solution:

$$\text{Sidra had sandwiches} = 3\frac{1}{4}$$

$$\text{She gave to her sister} = 1\frac{1}{2} \text{ of } 3\frac{1}{4}$$

$$= 1\frac{1}{2} \times 3\frac{1}{4}$$

$$= \frac{3}{2} \times \frac{13}{4} = \frac{3 \times 13}{2 \times 4} = \frac{39}{8} = 4\frac{7}{8}$$

So, her sister got $4\frac{7}{8}$ sandwich.

5. A shopkeeper sold $\frac{4}{5}$ of his total stock of sugar. If his stock of sugar was $22\frac{3}{4}$ kg, how much sugar has he sold?

Solution:

$$\text{total stock of sugar} = 22\frac{3}{4} \text{ kg}$$

$$\text{the shopkeeper sold} = \frac{4}{5} \text{ of his stock}$$

$$= \frac{4}{5} \text{ of } 22\frac{3}{4}$$

$$= \frac{4}{5} \times 22\frac{3}{4} = \frac{4}{5} \times \frac{91}{4} = \frac{\cancel{4}^{\textcircled{1}} \times 91}{5 \times \cancel{4}^{\textcircled{1}}} = \frac{91}{5} = 18\frac{1}{5}$$

So, he sold $18\frac{1}{5}$ kg of total stock.

6. How many boxes $8\frac{1}{4}$ centimeters high can fit on a shelf that is $43\frac{1}{4}$ centimeters high?

Solution:

$$\text{Height of shelf} = 43\frac{1}{4}$$

$$\text{Height of box} = 8\frac{1}{4}$$

$$\begin{aligned}\text{Number of boxes that can fit on the shelf} &= 43\frac{1}{4} \div 8\frac{1}{4} \\ &= \frac{173}{4} \div \frac{33}{4} \\ &= \frac{173}{\cancel{4}^1} \times \frac{\cancel{4}^1}{33} = \frac{173}{33} = 5\frac{8}{33}\end{aligned}$$

So, $5\frac{8}{33}$ boxes will fit into the shelf.

7. A carpenter cuts a $2\frac{1}{4}$ m long piece of wood into $\frac{3}{8}$ m long pieces. How many pieces of wood will he get?

Solution:

$$\text{Length of bigger piece of wood} = 2\frac{1}{4} \text{ m}$$

$$\text{Length of smaller piece} = \frac{3}{8} \text{ m}$$

$$\begin{aligned}\text{no. of pieces} &= 2\frac{1}{4} \div \frac{3}{8} \\ &= \frac{9}{4} \div \frac{3}{8} \\ &= \frac{\overset{3}{\cancel{9}}}{\underset{1}{\cancel{4}}} \times \frac{\overset{2}{\cancel{8}}}{\underset{1}{\cancel{3}}} \\ &= \frac{3 \times 2}{1 \times 1} \\ &= 6\end{aligned}$$

So, he will get 6 pieces of $\frac{3}{8}$ length.

Unit 4: Decimals

Learning Check 4.1

1. Compare these numbers by using these symbols $>$, $<$ or $=$.

a) $1.92 \square 4.45$

Answer: Compare the digits in ones place. as $1 < 4$
so, $1.92 \square< 4.45$.

b) $7.78 \square 7.17$

Answer: as, digits at ones place are same compare the digits in tenths place as $7 > 1$. so, $7.78 \square> 7.17$

c) $5.56 \square 5.59$

Answer: as, digits in ones and tenths place are same so, we compare digits in hundredth place, as $6 < 9$, so $5.56 \square< 5.59$.

d) $6.95 \square 6.87$

Answer: as, digits in ones place are same, so compare digits in tenths place, as $9 > 8$ so, $6.95 \square> 6.87$.

e) $4.79 \square 4.79$

Answer: as all digits are equal, so $4.79 \square= 4.79$

f) $6.19 \square 7.18$

Answer: Compare ones place digits, as $6 < 7$, so $6.19 \square< 7.18$

g) $5.56 \square 5.46$

Answer: Compare tenths place digits, as $5 > 4$, so $5.56 \square> 5.46$

h) $7.88 \square 7.88$

Answer: as all digits are equal, so $7.88 \square= 7.88$

i) $9.99 \square 9.89$

Answer: Compare tenth place digits, as $9 > 8$, so $9.99 \square> 9.89$

2. Arrange these decimal numbers in ascending order.

a) 67.8, 56.6, 89.8

Answer: Comparing digits at tens place, as $8 > 5$ and $8 > 6$. so 89.8 is the greatest number. as $5 < 6$ and $5 < 8$. so 56.6 is the smallest number, so

Ascending order = 56.6, 67.8, 89.8

b) 3.37, 3.35, 3.39

Answer: as digits in ones and tenths place are same so comparing digits in hundredths place, as $9 > 7$ and $9 > 5$ so 3.39 is the greatest number. As $5 < 7$ and $5 < 9$ so 3.35, so

Ascending order = 3.35, 3.37, 3.39

c) 2.18, 2.89, 2.43

Answer: Comparing the digits at tenths place. $2.89 > 2.43 > 2.18$, so

Ascending order = 2.18, 2.43, 2.89

d) 8.16, 7.17, 9.23

Answer: Comparing digits in ones place. $9.23 > 8.16 > 7.17$ so

Ascending order = 7.17, 8.16, 9.23

3. Arrange these numbers in descending order.

a) 8.84, 7.84, 8.94

Answer: Comparing digits at ones place, as $7 < 8$ so 7.84 is smaller than other two numbers. In 8.84 and 8.94 comparing the digits at tenths place as $9 > 8$, so 8.94 is greater than 8.84 so

descending order = 8.94, 8.84, 7.84

b) 3.21, 32.1, 2.56

Answer: As 32.1 is the only with digit at tens place so it is the greatest number. In other numbers compare the digits at ones place. As $2 < 3$ so 2.56 is the smallest number. so

descending order = 32.1, 3.21, 2.56

c) 1.19, 1.67, 1.17

Answer: Comparing digits at tenths place, as $1 < 6$ so, 1.67 is the greatest number. In other two numbers, compare the digits at hundredths place. As $9 > 7$ so 1.19 is greater than 1.17, so

descending order = 1.67, 1.19, 1.17

Learning Check 4.2

1. Add the following.

a) $4.231 + 3.210$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
4	.	2	3	1
+ 3	.	2	1	0
7	.	4	4	1

b) $6.908 + 10.9$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
	① 6	.	9	0	8
+ 1	0	.	9	0	0
1	7	.	8	0	8

c) $7.301 + 2.531$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
7	.	3	0	1
+ 2	.	5	3	1
9	.	8	3	2

d) $29.10 + 31.3$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
① 2	9	.	1	0	
+ 3	1	.	3	0	
6	0	.	4	0	

e) $64.20 + 43.34$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
6	4	.	2	0	
+ 4	3	.	3	4	
10	7	.	5	4	

f) $9.450 + 2.009$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
	9	.	4	5	0
+	+ 2	.	0	0	9
1	1	.	4	5	9

g) $5.306 + 4.982$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
5	.	3	0	6
+ 4	.	9	8	2
10	.	2	8	8

h) $8.230 + 4.509$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
8	.	2	3	0
+ 4	.	5	0	9
12	.	7	3	9

h) $2.211 + 31.61$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
	2	.	2	1	1
+ 3	1	.	6	1	0
3	3	.	8	2	1

2. Subtract the following.

a) $5.321 - 4.675$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
5	.	3	2	1
– 4	.	6	7	5
0	.	6	4	6

b) $5.216 - 2.300$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
5	.	2	1	6
– 2	.	3	0	0
2	.	9	1	6

c) $4.469 - 3.520$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
4	.	4	6	9
– 3	.	5	2	0
0	.	9	4	9

d) $9.415 - 1.421$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
9	.	4	1	5
– 1	.	4	2	1
7	.	9	9	4

e) $6.348 - 4.874$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
6	.	3	4	8
– 4	.	8	7	4
1	.	4	7	4

f) $2.275 - 1.51$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
2	.	2	7	5
– 1	.	5	1	0
0	.	7	6	5

g) $30.14 - 1.41$

Solution:

Tens	Ones	Decimal Point	Tenths	Hundredths	Thousandths
3	0	.	1	4	
–	1	.	4	1	
2	8	.	7	3	

h) $7.034 - 6.004$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
7	.	0	3	4
– 6	.	0	0	4
1	.	0	3	0

i) $3.041 - 1.401$

Solution:

Ones	Decimal Point	Tenths	Hundredths	Thousandths
3	.	0	4	1
– 1	.	4	0	1
1	.	6	4	0

3. Sara has a 1.4 m long blue ribbon and a 2.1 m long red ribbon. Find:

a) the total length of the ribbons.

Solution:

Length of blue ribbon = 1.4 m

Length of red ribbon = 2.1 m

	Ones	Decimal point	Tenths
	1	.	4
+	2	.	1
	3	.	5

$$\begin{aligned}\text{Total Length of both ribbon} &= 1.4 \text{ m} + 2.1 \text{ m} \\ &= 3.5 \text{ m}\end{aligned}$$

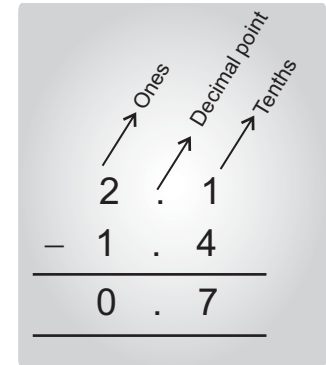
b) the difference between the lengths of the ribbons.

Solution:

$$\text{Length of blue ribbon} = 1.4 \text{ m}$$

$$\text{Length of red ribbon} = 2.1 \text{ m}$$

$$\begin{aligned}\text{Difference between both the lengths: } 2.1\text{m} - 1.4\text{m} \\ = 0.7 \text{ m}\end{aligned}$$



So the total length of both the ribbons is 3.5m, and the difference between lengths of both ribbons is 0.7m.

Learning Check 4.3

1. Multiply the following.

a) 23.6×10

Solution:

$$\begin{aligned}23.6 \times 10 \\ = 236.0 \\ = \text{or } 236\end{aligned}$$

b) 7.13×10

Solution:

$$\begin{aligned}7.13 \times 10 \\ = 71.3\end{aligned}$$

c) 8.90×10

Solution:

$$\begin{aligned}8.90 \times 10 \\ = 89.0 \\ = \text{or } 89\end{aligned}$$

d) 5.67×100

Solution:

$$\begin{aligned}5.67 \times 100 \\ = 567.0 \\ = \text{or } 567\end{aligned}$$

e) 30.1×100

Solution:

$$\begin{aligned}30.1 \times 100 \\ = 3010.0 \\ = \text{or } 3010\end{aligned}$$

f) 0.02×100

Solution:

$$\begin{aligned}0.02 \times 100 \\ = 2.0 \\ = \text{or } 2\end{aligned}$$

g) 5.19×1000

Solution:

$$\begin{aligned}5.19 \times 1000 \\ = 5190.0 \\ = \text{or } 5190\end{aligned}$$

h) 5.02×1000

Solution:

$$\begin{aligned}5.02 \times 1000 \\ = 5020.0 \\ = \text{or } 5020\end{aligned}$$

i) 4.5×1000

Solution:

$$\begin{aligned}4.5 \times 1000 \\ = 4500.0 \\ = \text{or } 4500\end{aligned}$$

2. Solve the following.

a) 65.3×5

Solution:

$$\begin{aligned} 65.3 \times 5 &= \frac{653}{10} \times 5 \\ &= \frac{653 \times 5}{10} \\ &= \frac{3265}{10} \\ &= 326.5 \end{aligned}$$

$$\begin{array}{r} \begin{array}{ccccccc} & \nearrow \text{tens} & & \nearrow \text{ones} & & \nearrow \text{Decimal point} & \nearrow \text{Tenths} \\ 6 & 5 & . & 3 & & & \\ \times & & & 5 & & & \\ \hline 3 & 2 & 6 & . & 5 & & \end{array} \\ \hline 65.3 \times 5 = 326.5 \end{array}$$

b) 4.34×14

Solution:

$$\begin{aligned} 4.34 \times 14 &= \frac{434}{100} \times 14 \\ &= \frac{434 \times 14}{100} \\ &= \frac{6076}{100} \\ &= 60.76 \end{aligned}$$

$$\begin{array}{r} \begin{array}{ccccccc} & \nearrow \text{ones} & & \nearrow \text{Decimal point} & & \nearrow \text{Tenths} & \nearrow \text{Hundredths} \\ 4 & . & 3 & 4 & & & \\ \times & & 1 & 4 & & & \\ \hline 1 & 7 & 3 & 6 & & & \\ 4 & 3 & 4 & 0 & & & \\ \hline 6 & 0 & . & 7 & 6 & & \end{array} \\ \hline \text{So } 4.34 \times 14 = 60.76 \end{array}$$

c) 5.61×71

Solution:

$$\begin{aligned} 5.61 \times 71 &= \frac{561}{100} \times 71 \\ &= \frac{561 \times 71}{100} \\ &= \frac{39831}{100} \\ &= 398.31 \end{aligned}$$

$$\begin{array}{r} \begin{array}{ccccccc} & \nearrow \text{tens} & & \nearrow \text{ones} & & \nearrow \text{Decimal point} & \nearrow \text{Tenths} & \nearrow \text{Hundredths} \\ 5 & . & 6 & 1 & & & & \\ \times & & 7 & 1 & & & & \\ \hline 5 & . & 6 & 1 & & & & \\ 3 & 9 & 2 & 7 & 0 & & & \\ \hline 3 & 9 & 8 & 3 & 1 & & & \end{array} \\ \hline \text{So } 5.61 \times 71 = 398.31 \end{array}$$

e) 6.32×48

Solution:

$$\begin{aligned} 6.32 \times 48 &= \frac{632}{100} \times 48 \\ &= \frac{632 \times 48}{100} \\ &= \frac{30,336}{100} \\ &= 303.36 \end{aligned}$$

Diagram illustrating the multiplication of 6.32×48 using the distributive property. The number 6.32 is broken down into 6 (tens), 3 (ones), and 2 (hundredths). The multiplication is shown as 632×48 , with partial products (632×8) and (632×40) being added. The result is 30336 , which is then divided by 100 to get 303.36 . Arrows indicate the placement of the decimal point and the final result.

So $6.32 \times 48 = 303.36$

f) 7.66×76

Solution:

$$\begin{aligned} 7.66 \times 76 &= \frac{766}{100} \times 76 \\ &= \frac{766 \times 76}{100} \\ &= \frac{58216}{100} \\ &= 582.16 \end{aligned}$$

Diagram illustrating the multiplication of 7.66×76 using the distributive property. The number 7.66 is broken down into 7 (ones), 6 (tenths), and 6 (hundredths). The multiplication is shown as 766×76 , with partial products (766×6) and (766×70) being added. The result is 58216 , which is then divided by 100 to get 582.16 . Arrows indicate the placement of the decimal point and the final result.

So $7.66 \times 76 = 582.16$

g) 3.67×27

Solution:

$$\begin{aligned} 3.67 \times 27 &= \frac{367}{100} \times 27 \\ &= \frac{367 \times 27}{100} \\ &= \frac{9909}{100} \\ &= 99.09 \end{aligned}$$

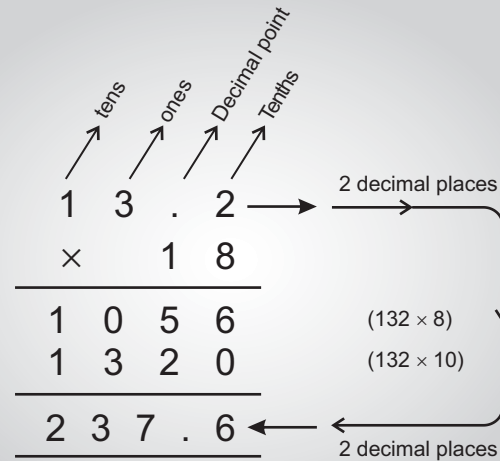
Diagram illustrating the multiplication of 3.67×27 using the distributive property. The number 3.67 is broken down into 3 (ones), 6 (tenths), and 7 (hundredths). The multiplication is shown as 367×27 , with partial products (367×7) and (367×20) being added. The result is 9909 , which is then divided by 100 to get 99.09 . Arrows indicate the placement of the decimal point and the final result.

So $3.67 \times 27 = 99.09$

h) 13.2×18

Solution:

$$\begin{aligned} 13.2 \times 18 &= \frac{132}{100} \times 18 \\ &= \frac{132 \times 18}{100} \\ &= \frac{2376}{100} \\ &= 237.6 \end{aligned}$$

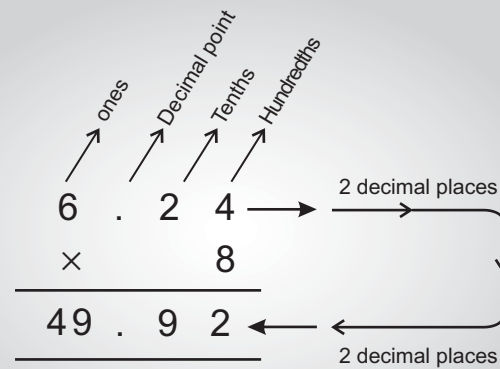


So $13.2 \times 18 = 237.6$

l) 6.24×8

Solution:

$$\begin{aligned} 6.24 \times 8 &= \frac{624}{100} \times 8 \\ &= \frac{624 \times 8}{100} \\ &= \frac{4992}{100} \\ &= 49.92 \end{aligned}$$



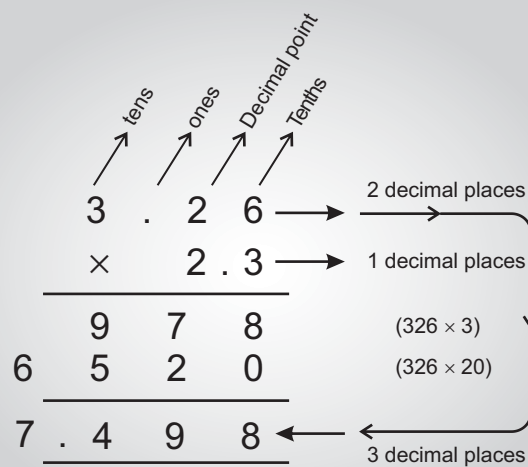
So $6.24 \times 8 = 49.92$

3. Find the product of the following.

a) 3.26×2.3

Solution:

$$\begin{aligned} 3.26 \times 2.3 &= \frac{326}{100} \times \frac{23}{10} \\ &= \frac{326 \times 23}{100 \times 10} \\ &= \frac{7498}{1000} \\ &= 7.498 \end{aligned}$$



So $3.26 \times 2.3 = 7.498$

b) 2.34×0.23

Solution:

$$\begin{aligned} 2.34 \times 0.23 &= \frac{234}{100} \times \frac{23}{10} \\ &= \frac{234 \times 23}{100 \times 10} \\ &= \frac{5382}{10000} \\ &= 0.5382 \end{aligned}$$

So $2.34 \times 0.23 = 0.5382$

c) 0.04×24.1

Solution:

$$\begin{aligned} 0.04 \times 24.1 &= \frac{4}{100} \times \frac{241}{10} \\ &= \frac{4 \times 241}{100 \times 10} \\ &= \frac{964}{1000} \\ &= 0.964 \end{aligned}$$

So $24.1 \times 0.04 = 0.964$

d) 3.32×0.53

Solution:

$$\begin{aligned} 3.32 \times 0.53 &= \frac{332}{100} \times \frac{53}{10} \\ &= \frac{332 \times 53}{100 \times 10} \\ &= \frac{17596}{10000} \\ &= 1.7596 \end{aligned}$$

So $3.32 \times 0.53 = 1.7596$

e) 6.47×4.27

Solution:

$$\begin{aligned} 6.47 \times 4.27 &= \frac{647}{100} \times \frac{427}{100} \\ &= \frac{647 \times 427}{100 \times 100} \\ &= \frac{27629}{10000} \\ &= 27.6269 \end{aligned}$$

The diagram illustrates the multiplication of 6.47 by 4.27. It shows the numbers aligned by place value: ones, decimal point, tenths, and hundredths. Arrows indicate the decimal points for both numbers, each having 2 decimal places. The multiplication is performed in three steps: 647×7 , 647×20 , and 647×400 . The partial products are shown as 4529, 12940, and 258800. These are then summed to get the final product, 27.6269, which has 4 decimal places.

So $6.47 \times 4.27 = 27.6269$

f) 9.20×1.24

Solution:

$$\begin{aligned} 9.20 \times 1.24 &= \frac{920}{100} \times \frac{124}{100} \\ &= \frac{920 \times 124}{100 \times 100} \\ &= \frac{114080}{10000} \\ &= 11.4080 \end{aligned}$$

The diagram illustrates the multiplication of 9.20 by 1.24. It shows the numbers aligned by place value: ones, decimal point, tenths, and hundredths. Arrows indicate the decimal points for both numbers, each having 2 decimal places. The multiplication is performed in three steps: 920×4 , 920×20 , and 920×100 . The partial products are shown as 3680, 18400, and 92000. These are then summed to get the final product, 11.4080, which has 4 decimal places.

So $9.20 \times 1.24 = 11.4080$

g) 7.31×3.62

Solution:

$$\begin{aligned} 7.31 \times 3.62 &= \frac{731}{100} \times \frac{362}{100} \\ &= \frac{731 \times 362}{100 \times 100} \\ &= \frac{264622}{10000} \\ &= 26.4622 \end{aligned}$$

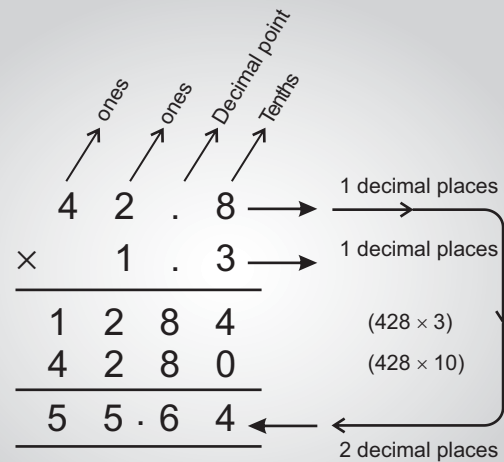
The diagram illustrates the multiplication of 7.31 by 3.62. It shows the numbers aligned by place value: ones, decimal point, tenths, and hundredths. Arrows indicate the decimal points for both numbers, each having 2 decimal places. The multiplication is performed in three steps: 731×2 , 731×60 , and 731×300 . The partial products are shown as 1462, 43860, and 219300. These are then summed to get the final product, 26.4622, which has 4 decimal places.

So $7.31 \times 3.62 = 26.4622$

h) 42.8×1.3

Solution:

$$\begin{aligned} 42.8 \times 1.3 &= \frac{428}{10} \times \frac{13}{10} \\ &= \frac{428 \times 13}{10 \times 10} \\ &= \frac{5564}{100} \\ &= 55.64 \end{aligned}$$

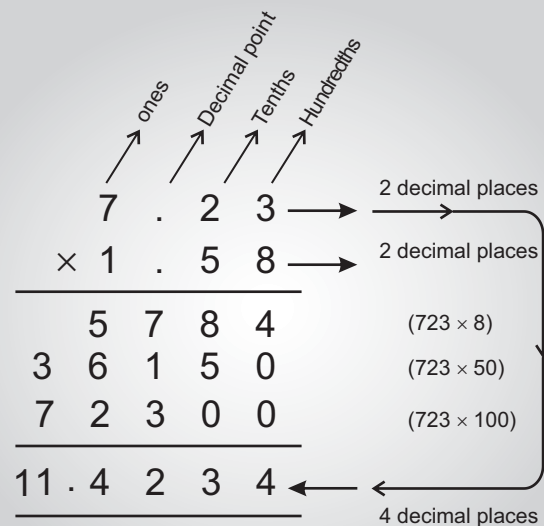


So $42.8 \times 1.3 = 55.64$

i) 7.23×1.58

Solution:

$$\begin{aligned} 7.23 \times 1.58 &= \frac{723}{100} \times \frac{158}{100} \\ &= \frac{723 \times 158}{100 \times 100} \\ &= \frac{114234}{10000} \\ &= 11.4234 \end{aligned}$$



So $7.23 \times 1.58 = 11.4234$

4. The distance from Asim's home to the masjid is 2.15 km and the distance from his home to school is 3 times more than the distance from his home to the masjid. What is the distance from his home to school?

Distance from Asim's home to masjid = 2.15 km

Distance from his home to school = 3 time of 2.15 km

= 3×2.15 km

= $3 \times \frac{215}{100} = \frac{3 \times 215}{100}$

So the distance from Asim's home = $\frac{645}{100}$

to school is 6.45km

Learning Check 4.4

1. Divide the following decimals by 10, 100 and 1000.

By 10	By 100	By 1000
a) 2.65 Solution: $\begin{array}{r} 2.65 \div 10 \\ \hline = 0.265 \end{array}$	Solution: $\begin{array}{r} 2.65 \div 100 \\ \hline = 0.0265 \end{array}$	Solution: $\begin{array}{r} 2.65 \div 1000 \\ \hline = 0.00265 \end{array}$
b) 8.75 Solution: $\begin{array}{r} 8.75 \div 10 \\ \hline = 0.875 \end{array}$	Solution: $\begin{array}{r} 8.75 \div 100 \\ \hline = 0.0875 \end{array}$	Solution: $\begin{array}{r} 8.75 \div 1000 \\ \hline = 0.00875 \end{array}$
c) 3.38 Solution: $\begin{array}{r} 3.38 \div 10 \\ \hline = 0.338 \end{array}$	Solution: $\begin{array}{r} 3.38 \div 100 \\ \hline = 0.0338 \end{array}$	Solution: $\begin{array}{r} 3.38 \div 1000 \\ \hline = 0.00338 \end{array}$
d) 35.2 Solution: $\begin{array}{r} 35.2 \div 10 \\ \hline = 3.52 \end{array}$	Solution: $\begin{array}{r} 35.2 \div 100 \\ \hline = 0.352 \end{array}$	Solution: $\begin{array}{r} 35.2 \div 1000 \\ \hline = 0.0352 \end{array}$
e) 4.97 Solution: $\begin{array}{r} 4.97 \div 10 \\ \hline = 0.497 \end{array}$	Solution: $\begin{array}{r} 4.97 \div 100 \\ \hline = 0.0497 \end{array}$	Solution: $\begin{array}{r} 4.97 \div 1000 \\ \hline = 0.00497 \end{array}$

By 10	By 100	By 1000
f) 6.64 Solution: $\begin{array}{r} 6.64 \div 10 \\ \hline = 0.664 \end{array}$	Solution: $\begin{array}{r} 6.64 \div 100 \\ \hline = 0.0664 \end{array}$	Solution: $\begin{array}{r} 6.64 \div 1000 \\ \hline = 0.00664 \end{array}$
g) 7.63 Solution: $\begin{array}{r} 7.63 \div 10 \\ \hline = 0.763 \end{array}$	Solution: $\begin{array}{r} 7.63 \div 100 \\ \hline = 0.0763 \end{array}$	Solution: $\begin{array}{r} 7.63 \div 1000 \\ \hline = 0.00763 \end{array}$
h) 5.93 Solution: $\begin{array}{r} 5.93 \div 10 \\ \hline = 0.593 \end{array}$	Solution: $\begin{array}{r} 5.93 \div 100 \\ \hline = 0.0593 \end{array}$	Solution: $\begin{array}{r} 5.93 \div 1000 \\ \hline = 0.00593 \end{array}$

2. Divide the following decimals.

a) $2.10 \div 70$

Solution:

$$\begin{aligned}
 2.10 \div 70 &= \frac{210}{100} \times \frac{1}{70} \\
 &= \frac{210 \times 1}{100 \times 70} \\
 &= \frac{210}{7000} \\
 &= 0.03
 \end{aligned}$$

So, $2.10 \div 70 = 0.03$

Remove the decimal point
change division sign into
multiplication sign and
replace 70 by its reciprocal

$$\begin{array}{r}
 0.03 \\
 7000 \overline{) 21000} \\
 \underline{- 21000} \\
 0
 \end{array}$$

or

$2.10 \div 70$

$$\begin{array}{r}
 3 \\
 70 \overline{) 210} \\
 \underline{- 210} \\
 0
 \end{array}$$

So, $2.10 \div 70 = 0.03$

b) $1.58 \div 16$

Solution:

$$\begin{aligned} 1.58 \div 16 &= \frac{158}{100} \div 16 \\ &= \frac{158}{100} \times \frac{1}{16} \\ &= \frac{158 \times 1}{100 \times 16} \\ &= \frac{158}{1600} \\ &= 0.09875 \end{aligned}$$

So, $1.58 \div 16 = 0.09875$

$$\begin{array}{r} 0.09875 \\ 1600 \overline{) 15800} \\ \underline{-14400} \\ 14000 \\ \underline{-12800} \\ 12000 \\ \underline{-11200} \\ 8000 \\ \underline{-8000} \\ 0 \end{array}$$

or

$1.58 \div 16$

$$\begin{array}{r} 9.875 \\ 16 \overline{) 158} \\ \underline{-144} \\ 140 \\ \underline{-128} \\ 120 \\ \underline{-112} \\ 80 \\ \underline{-80} \\ 0 \end{array}$$

So, $1.58 \div 16 = 9.875$
 $= 0.09875$

c) $6.12 \div 34$

Solution:

$$\begin{aligned} 6.12 \div 34 &= \frac{612}{100} \div 34 \\ &= \frac{612}{100} \times \frac{1}{34} \\ &= \frac{612 \times 1}{100 \times 34} \\ &= \frac{612}{3400} \\ &= 0.18 \end{aligned}$$

So, $612 \div 34 = 0.18$

$$\begin{array}{r} 0.18 \\ 3400 \overline{) 6120} \\ \underline{-3400} \\ 27200 \\ \underline{-27200} \\ 0 \end{array}$$

or

$6.12 \div 34$

$$\begin{array}{r} 18 \\ 34 \overline{) 612} \\ \underline{-34} \\ 272 \\ \underline{-272} \\ 0 \end{array}$$

So, $6.12 \div 34 = 18$
 $= 0.18$

d) $5.76 \div 18$

Solution:

$$\begin{aligned} 5.76 \div 18 &= \frac{576}{100} \div 18 \\ &= \frac{576}{100} \times \frac{1}{18} \\ &= \frac{576 \times 1}{100 \times 18} \\ &= \frac{576}{1800} \\ &= 0.32 \end{aligned}$$

So, $5.76 \div 18 = 0.32$

$$\begin{array}{r} 0.32 \\ 1800 \overline{) 5760} \\ \underline{-5400} \\ 3600 \\ \underline{-3600} \\ 0 \end{array}$$

or $5.76 \div 18$

$$\begin{array}{r} 32 \\ 18 \overline{) 576} \\ \underline{-54} \\ 36 \\ \underline{-36} \\ 0 \end{array}$$

So, $5.76 \div 18 = 0.32$

e) $3.29 \div 7$

Solution:

$$\begin{aligned} 3.29 \div 7 &= \frac{329}{100} \div 7 \\ &= \frac{329}{100} \times \frac{1}{7} \\ &= \frac{329 \times 1}{100 \times 7} \\ &= \frac{329}{700} \\ &= 0.47 \end{aligned}$$

So, $3.29 \div 7 = 0.47$

$$\begin{array}{r} 0.47 \\ 700 \overline{) 3290} \\ \underline{-2800} \\ 4900 \\ \underline{-4900} \\ 0 \end{array}$$

or $3.29 \div 7$

$$\begin{array}{r} 47 \\ 7 \overline{) 329} \\ \underline{-28} \\ 49 \\ \underline{-49} \\ 0 \end{array}$$

So, $3.29 \div 7 = 0.47$

f) $8.55 \div 9$

Solution:

$$\begin{aligned} 8.55 \div 9 &= \frac{855}{100} \div 9 \\ &= \frac{855}{100} \times \frac{1}{9} \\ &= \frac{855 \times 1}{100 \times 9} \\ &= \frac{855}{900} \\ &= 0.95 \end{aligned}$$

So, $8.55 \div 9 = 0.95$

$$\begin{array}{r} 0.95 \\ 900 \overline{) 8550} \\ \underline{- 8100} \\ 4500 \\ \underline{- 4500} \\ 0 \end{array}$$

or $8.55 \div 9$

$$\begin{array}{r} 95 \\ 9 \overline{) 855} \\ \underline{- 81} \\ 45 \\ \underline{- 45} \\ 0 \end{array}$$

So, $8.55 \div 9 = \underline{\underline{95}} = 0.95$

g) $9.75 \div 13$

Solution:

$$\begin{aligned} 9.75 \div 13 &= \frac{975}{100} \div 13 \\ &= \frac{975}{100} \times \frac{1}{13} \\ &= \frac{975 \times 1}{100 \times 13} \\ &= \frac{975}{1300} \\ &= 0.75 \end{aligned}$$

So, $9.75 \div 13 = 0.75$

$$\begin{array}{r} 0.75 \\ 1300 \overline{) 9750} \\ \underline{- 9100} \\ 6500 \\ \underline{- 6500} \\ 0 \end{array}$$

or $9.75 \div 13$

$$\begin{array}{r} 75 \\ 13 \overline{) 975} \\ \underline{- 91} \\ 65 \\ \underline{- 65} \\ 0 \end{array}$$

So, $9.75 \div 13 = \underline{\underline{75}} = 0.75$

h) $0.75 \div 15$

Solution:

$$\begin{aligned} 0.75 \div 15 &= \frac{75}{100} \div 15 \\ &= \frac{75}{100} \times \frac{1}{15} \\ &= \frac{75 \times 1}{100 \times 15} \\ &= \frac{75}{1500} \\ &= 0.05 \end{aligned}$$

So, $0.75 \div 15 = 0.05$

or $0.75 \div 15$

$$\begin{array}{r} 5 \\ 15 \overline{) 75} \\ \underline{- 75} \\ 0 \end{array}$$

So, $0.75 \div 15 = 0.05$

3. Solve the following.

a) $1.75 \div 0.7$

Solution:

$$\begin{aligned} 1.75 \div 0.7 &= \frac{175}{100} \div \frac{7}{10} \\ &= \frac{175}{100} \times \frac{10}{7} \\ &= \frac{175 \times 10}{100 \times 7} \\ &= \frac{1750}{700} \\ &= 2.5 \end{aligned}$$

So, $1.75 \div 0.7 = 2.5$

or $1.75 \div 0.7$

$$\begin{aligned} &= \frac{1.75}{0.7} \times \frac{10}{10} \\ &= \frac{1.75 \times 10}{0.7 \times 10} \\ &= \frac{17.5}{7} \\ &= 2.5 \end{aligned}$$

$$\begin{array}{r} 2.5 \\ 7 \overline{) 17.5} \\ \underline{- 14} \\ 35 \\ \underline{- 35} \\ 0 \end{array}$$

b) $6.86 \div 0.8$

Solution:

$$\begin{aligned} 6.86 \div 0.8 &= \frac{686}{100} \div \frac{8}{10} \\ &= \frac{686}{100} \times \frac{10}{8} \\ &= \frac{686 \times 10}{100 \times 8} \\ &= \frac{6860}{800} \\ &= 8.575 \end{aligned}$$

So, $6.86 \div 0.8 = 8.575$

$$\begin{array}{r} 8.575 \\ 800 \overline{) 6860} \\ \underline{-6400} \\ 4600 \\ \underline{-4000} \\ 6000 \\ \underline{-5600} \\ 4000 \\ \underline{-4000} \\ 0 \end{array}$$

or $6.86 \div 0.8$

$$\begin{aligned} &= \frac{6.86}{0.8} \times \frac{10}{10} \\ &= \frac{6.85 \times 10}{0.8 \times 10} \\ &= \frac{68.6}{8} \\ &= 8.575 \end{aligned}$$

$$\begin{array}{r} 8.575 \\ 8 \overline{) 686} \\ \underline{-64} \\ 46 \\ \underline{-40} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

c) $4.25 \div 0.4$

Solution:

$$\begin{aligned} 4.25 \div 0.4 &= \frac{425}{100} \div \frac{4}{10} \\ &= \frac{425}{100} \times \frac{10}{4} \\ &= \frac{425 \times 10}{100 \times 4} \\ &= \frac{4250}{400} \\ &= 10.625 \end{aligned}$$

So, $4.25 \div 0.4 = 10.625$

$$\begin{array}{r} 10.625 \\ 400 \overline{) 4250} \\ \underline{-400} \\ 2500 \\ \underline{-2400} \\ 1000 \\ \underline{-800} \\ 2000 \\ \underline{-2000} \\ 0 \end{array}$$

or $4.25 \div 0.4$

$$\begin{aligned} &= \frac{4.25}{0.4} \times \frac{10}{10} \\ &= \frac{4.25 \times 10}{0.4 \times 10} \\ &= \frac{42.5}{4} \\ &= 10.625 \end{aligned}$$

$$\begin{array}{r} 10.625 \\ 4 \overline{) 42.5} \\ \underline{-4} \\ 025 \\ \underline{-24} \\ 10 \\ \underline{-8} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

d) $1.06 \div 0.2$

Solution:

$$\begin{aligned} 1.06 \div 0.2 &= \frac{106}{100} \div \frac{2}{10} \\ &= \frac{106}{100} \times \frac{10}{2} \\ &= \frac{106 \times 10}{100 \times 2} \\ &= \frac{1060}{200} \\ &= 5.3 \end{aligned}$$

$$\begin{array}{r} 5.3 \\ 200 \overline{)1060} \\ \underline{-1000} \\ 600 \\ \underline{-600} \\ 0 \end{array}$$

So, $1.06 \div 0.2 = 5.3$

or $1.06 \div 0.2$

$$\begin{aligned} &= \frac{1.06}{0.2} \times \frac{10}{10} \\ &= \frac{1.06 \times 10}{0.2 \times 10} \\ &= \frac{10.6}{2} \\ &= 5.3 \end{aligned}$$

$$\begin{array}{r} 5.3 \\ 2 \overline{)10.6} \\ \underline{-10} \\ 06 \\ \underline{-6} \\ 0 \end{array}$$

e) $13.5 \div 1.5$

Solution:

$$\begin{aligned} 13.5 \div 1.5 &= \frac{135}{10} \div \frac{15}{10} \\ &= \frac{135}{10} \times \frac{10}{15} \\ &= \frac{135 \times 10}{10 \times 15} \\ &= \frac{1350}{150} = \frac{135}{15} \\ &= 9 \end{aligned}$$

$$\begin{array}{r} 9 \\ 15 \overline{)135} \\ \underline{-135} \\ 0 \end{array}$$

So, $13.5 \div 1.5 = 9$

or $13.5 \div 1.5$

$$\begin{aligned} &= \frac{13.5}{1.5} \times \frac{10}{10} \\ &= \frac{13.5 \times 10}{1.5 \times 10} \\ &= \frac{135}{15} \\ &= 9 \end{aligned}$$

$$\begin{array}{r} 9 \\ 15 \overline{)135} \\ \underline{-135} \\ 0 \end{array}$$

f) $2.88 \div 3.6$

Solution:

$$\begin{aligned} 2.88 \div 3.6 &= \frac{288}{100} \div \frac{36}{10} \\ &= \frac{288}{100} \times \frac{10}{36} \\ &= \frac{288 \times 10}{100 \times 36} \\ &= \frac{2880}{3600} = \frac{288}{360} \\ &= 0.8 \end{aligned}$$

So, $2.88 \div 3.6 = 0.8$

$$\begin{array}{r} 0.8 \\ 360 \overline{) 2880} \\ \underline{-2880} \\ 0 \end{array}$$

or $2.88 \div 3.6$

$$\begin{aligned} &= \frac{2.88}{3.6} \times \frac{10}{10} \\ &= \frac{2.88 \times 10}{3.6 \times 10} \\ &= \frac{28.8}{36} \\ &= 0.8 \end{aligned}$$

$$\begin{array}{r} 0.8 \\ 36 \overline{) 28.8} \\ \underline{-288} \\ 0 \end{array}$$

g) $9.89 \div 4.3$

Solution:

$$\begin{aligned} 9.89 \div 4.3 &= \frac{989}{100} \div \frac{43}{10} \\ &= \frac{989}{100} \times \frac{10}{43} \\ &= \frac{989 \times 10}{100 \times 43} \\ &= \frac{9890}{4300} = \frac{989}{430} \\ &= 2.3 \end{aligned}$$

So, $9.89 \div 4.3 = 2.3$

$$\begin{array}{r} 2.3 \\ 430 \overline{) 989} \\ \underline{-860} \\ 1290 \\ \underline{1290} \\ 0 \end{array}$$

or $9.89 \div 4.3$

$$\begin{aligned} &= \frac{9.89}{4.3} \times \frac{10}{10} \\ &= \frac{9.89 \times 10}{4.3 \times 10} \\ &= \frac{98.9}{43} \\ &= 2.3 \end{aligned}$$

$$\begin{array}{r} 2.3 \\ 43 \overline{) 98.9} \\ \underline{-86} \\ 129 \\ \underline{-129} \\ 0 \end{array}$$

h) $2.8 \div 0.2$

Solution:

$$\begin{aligned} 2.8 \div 0.2 &= \frac{28}{10} \div \frac{2}{10} \\ &= \frac{28}{10} \times \frac{10}{2} \\ &= \frac{28 \times 10}{10 \times 2} = \frac{280}{20} \\ &= \frac{28}{2} \\ &= 14 \end{aligned}$$

So, $2.8 \div 0.2 = 14$

$$\begin{array}{r} 14 \\ 2 \overline{)28} \\ \underline{-2} \\ 08 \\ \underline{-8} \\ 0 \end{array}$$

or $2.8 \div 0.2$

$$\begin{aligned} &= \frac{2.8}{0.2} \times \frac{10}{10} \\ &= \frac{2.8 \times 10}{0.2 \times 10} \\ &= \frac{28}{2} \\ &= 14 \end{aligned}$$

$$\begin{array}{r} 14 \\ 2 \overline{)28} \\ \underline{-2} \\ 08 \\ \underline{-8} \\ 0 \end{array}$$

4. 91.8 grams of whipped cream is equally divided to make 3 different types of desserts. How much cream is used in each dessert?

Solution:

Total amount of whipped cream = 91.8 grams

The cream is to be divided = 3

Cream used in each dessert = $91.8 \div 3$

$$\begin{aligned} &= \frac{918}{10} \times \frac{1}{3} \\ &= \frac{918}{30} \\ &= 30.6 \text{ kg} \end{aligned}$$

$$\begin{array}{r} 30.6 \\ 30 \overline{)918} \\ \underline{-90} \\ 180 \\ \underline{-180} \\ 0 \end{array}$$

So, 30.6 grams of whipped cream will be used in each dessert.

5. Sidra is making fruit bags of 1.2 kg each to distribute among needy persons during Ramadan. If she has 22.8 kg of fruit altogether, find the number of bags she can make.

Solution:

Capacity of each fruit bag = 1.2 kg

Total amount of fruit = 22.8 kg

Number of bags she can make = $22.8 \div 1.2$

$$\begin{array}{r} 19 \\ 12 \overline{) 228} \\ \underline{- 12} \\ 108 \\ \underline{- 108} \\ 0 \end{array}$$

$$= \frac{228}{10} \times \frac{12}{10} = \frac{228 \times 10}{10 \times 12}$$

$$= \frac{2280}{120} = \frac{228}{12}$$

$$= 19 \text{ kg}$$

So, Sidra can make 19 bags.

6. During a week, Umar covered a distance of 37.5 km while jogging in the park. If in one round, he covered a distance of 2.5 km, then find:
a. How many rounds of track did he complete?

Solution:

Total distance Umar covered in a week = 37.5 km

Distance covered in one round = 2.5 km

Number of rounds of the track he complete = $37.5 \div 2.5$

$$\begin{array}{r} 15 \\ 25 \overline{) 375} \\ \underline{- 25} \\ 125 \\ \underline{- 125} \\ 0 \end{array}$$

$$= \frac{375}{10} \div \frac{25}{10} = \frac{375 \times 10}{10 \times 25}$$

$$= \frac{3750}{250} = \frac{375}{25}$$

$$= 15$$

So, he completed 15 rounds of the track.

b. if he takes 10 rounds, how much distance will he cover?

Solution:

Distance covered in one round = 2.5 km

number of rounds = 10

Distance covered in 10 rounds = 2.5×10

$$= \frac{25}{10} \times 10$$

$$= 25 \text{ km}$$

So, he covered 25 km in 10 rounds.

Learning Check 4.5

1. Convert the following fractions into decimals.

a) $\frac{3}{7}$

Solution:

Write 3 as 3.0 to make the calculation easier

$$\begin{array}{r}
 0.42857 \\
 7 \overline{) 3.0} \\
 \underline{- 0} \\
 30 \\
 \underline{- 28} \\
 20 \\
 \underline{- 14} \\
 60 \\
 \underline{- 56} \\
 40 \\
 \underline{- 35} \\
 50 \\
 \underline{- 49} \\
 1
 \end{array}$$

So, $\frac{3}{7} = 0.42857$

b) $\frac{4}{6}$

Solution:

Write 4 as 4.0 to make the calculation easier

$$\begin{array}{r}
 0.66666 \\
 6 \overline{) 4.0} \\
 \underline{- 0} \\
 40 \\
 \underline{- 36} \\
 40 \\
 \underline{- 36} \\
 40 \\
 \underline{- 36} \\
 40 \\
 \underline{- 36} \\
 40 \\
 \underline{- 36} \\
 0
 \end{array}$$

So, $\frac{4}{6} = 0.66666$

c) $\frac{9}{2}$

Solution:

Write 9 as 9.0 to make the calculation easier

$$\begin{array}{r} 4.5 \\ 2 \overline{) 9.0} \\ \underline{- 8} \\ 10 \\ \underline{- 10} \\ 0 \end{array}$$

So, $\frac{9}{2} = 4.5$

e) $\frac{2}{8}$

Solution:

Write 2 as 2.0 to make the calculation easier

$$\begin{array}{r} 0.25 \\ 8 \overline{) 2.0} \\ \underline{- 0} \\ 20 \\ \underline{- 16} \\ 40 \\ \underline{- 40} \\ 0 \end{array}$$

So, $\frac{2}{8} = 0.25$

d) $\frac{7}{2}$

Solution:

Write 7 as 7.0 to make the calculation easier

$$\begin{array}{r} 3.5 \\ 2 \overline{) 7.0} \\ \underline{- 6} \\ 10 \\ \underline{- 10} \\ 0 \end{array}$$

So, $\frac{7}{2} = 3.5$

f) $\frac{7}{5}$

Solution:

Write 7 as 7.0 to make the calculation easier

$$\begin{array}{r} 1.4 \\ 5 \overline{) 7.0} \\ \underline{- 5} \\ 20 \\ \underline{- 20} \\ 0 \end{array}$$

So, $\frac{7}{5} = 1.4$

2. Sara bought $\frac{5}{2}$ m of cloth for her shirt. Convert this fraction into decimal.

Solution:

Mass of watermelon = $\frac{11}{3}$ kg

in decimal = $\frac{11}{3}$

Write 11 as 11.0 to make the calculation easier

$$\begin{array}{r}
 3.666 \\
 3 \overline{) 11.0} \\
 \underline{-9} \\
 20 \\
 \underline{-18} \\
 20 \\
 \underline{-18} \\
 2
 \end{array}$$

So, $\frac{11}{3} = 3.666$ or 3.67

Learning Check 4.6

1. Convert the following fractions into decimals.

	Rounded off to the nearest tenth	Rounded off to the nearest hundredth
a) 7.859	As the digit in the hundredth place is 5, so we add 1 to the tenths place digit and remove the remaining digits to the right. $7.859 \approx 7.9$ $\begin{array}{r} 7.8 \\ + 1 \\ \hline 7.9 \end{array}$	As the digit in the thousandth place is 9, so we add 1 to the hundredths place digit and remove the remaining digits to the right. $7.859 \approx 7.86$ $\begin{array}{r} 7.85 \\ + 1 \\ \hline 7.86 \end{array}$
b) 6.786	As the digit in the hundredth place is greater than 5, so we add 1 to the tenths place digit and remove the next digits. $6.786 \approx 6.8$ $\begin{array}{r} 6.7 \\ + 1 \\ \hline 6.8 \end{array}$	As the digit in the thousandth place is greater than 5, so we add 1 to the hundredths place digit and remove the remaining digits to the right. $6.786 \approx 6.79$ $\begin{array}{r} 6.78 \\ + 1 \\ \hline 6.79 \end{array}$

c) 80.345	As the digit in the hundredth place is less than 5, we do not change the tenths place digit and remove all the digits to the right. $80.345 \approx 80.3$	As the digit in the thousandth place is 5, so we add 1 to the hundredths place digit and remove the remaining digits to the right. $80.345 \approx 80.35$ $\begin{array}{r} 80.34 \\ + 1 \\ \hline 80.35 \end{array}$
d) 869.496	As the digit in the hundredths place is greater than 5, we add 1 to the tenths place digit and remove all the digits to its right. $869.496 \approx 869.5$ $\begin{array}{r} 869.4 \\ + 1 \\ \hline 869.5 \end{array}$	As the digit in the thousandth place is greater than 5, add 1 to the hundredths place digit and remove all digits to its right. $869.496 \approx 869.50$ $\begin{array}{r} 869.49 \\ + 1 \\ \hline 869.50 \end{array}$
e) 153.15	As the digit in the hundredths place is 5, we add 1 to the tenths place digit and remove the next digits. $153.15 \approx 153.2$ $\begin{array}{r} 153.1 \\ + 1 \\ \hline 153.2 \end{array}$	As there is no digit in the thousandths place we do not change the hundredths place digit. $153.15 \approx 153.15$
f) 564.321	As the digit in the hundredth place is less than 5, we do not change the tenths place digit and just remove the next digits to the right. $564.321 \approx 564.3$	As the digit in the thousandth place is less than 5, we do not change the hundredths place digit and remove the next digits to its right. $564.321 \approx 564.32$

g) 58.889

As the digit in the hundredth place is greater than 5, we add 1 to tenths place digit and remove the next digits to its right.

$$58.889 \approx 58.9$$

$$\begin{array}{r} 58.8 \\ + 1 \\ \hline 58.9 \end{array}$$

As the digit in the thousandth place is greater than 5, we add 1 to the hundredths place digit and remove the next digits to its right.

$$58.889 \approx 58.89$$

$$\begin{array}{r} 58.88 \\ + 1 \\ \hline 58.89 \end{array}$$

h) 176.126

As the digit in the hundredths place is less than 5, we keep the tenths place digit unchanged and remove all the digits to its right.

$$176.126 \approx 176.1$$

As the digit in the thousandths place is greater than 5, we add 1 to the hundredths place digit and remove the next digit.

$$176.126 \approx 176.13$$

$$\begin{array}{r} 176.12 \\ + 1 \\ \hline 176.13 \end{array}$$

i) 841.718

As the digit in the hundredth place is less than 5, we keep the tenths place digit unchanged and remove all the digits to its right.

$$841.718 \approx 841.7$$

As the digit in the thousandth place is greater than 5, we add 1 to the hundredths place digit and remove the next digits.

$$841.718 \approx 841.72$$

$$\begin{array}{r} 841.71 \\ + 1 \\ \hline 841.72 \end{array}$$

Learning Check 4.7

1. Estimate these sums and then verify your estimation by actual calculation.

a) $43.21 + 23.25$

Solution:

Round off the give numbers to the nearest whole numbers.

$$43.21 \approx 43 \quad , \quad 23.25 \approx 23$$

add these two whole numbers to estimate the sum.

$$\begin{array}{r} 43 \\ + 23 \\ \hline 66 \end{array}$$

$$43.21 + 23.25 \approx 43 + 23 = 66$$

Add 43.21 and 23.25 to verify our estimation.

$$\begin{array}{r} 43.21 \\ + 23.25 \\ \hline 66.46 \end{array}$$

As 66.46 is approximately equal to 66 so our estimation is correct.

b) $56.56 + 13.34$

Solution:

Round off the given numbers to the nearest whole numbers.

$$56.56 \approx 57 \quad , \quad 13.34 \approx 13$$

add these two whole numbers to estimate the sum.

$$\begin{array}{r} 57 \\ + 13 \\ \hline 70 \end{array}$$

$$56.56 + 13.34 \approx 57 + 13 = 70$$

Add $56.56 + 13.34$ to verify our estimation.

$$\begin{array}{r} 56.56 \\ + 13.34 \\ \hline 69.90 \end{array}$$

As 69.90 is close to 70, so our estimated value is correct.

c) $32.23 + 45.33$

Solution:

Round off the given numbers to the nearest whole numbers.

$$32.23 \approx 32, \quad 45.33 \approx 45$$

add these two whole numbers to estimate the sum.

$$\begin{array}{r} 32 \\ + 45 \\ \hline 77 \end{array}$$

$$32.23 + 45.33 \approx 32 + 45 = 77$$

Add 32.23 and 45.33 to verify our estimation.

$$\begin{array}{r} 32.23 \\ + 45.33 \\ \hline 77.56 \end{array}$$

As 77.56

d) $28.6 + 46.1$

Solution:

Round off the given numbers to the nearest whole numbers.

$$28.6 \approx 29, \quad 46.1 \approx 46$$

add these two whole numbers to estimate the sum.

$$\begin{array}{r} 29 \\ + 46 \\ \hline 75 \end{array}$$

$$28.6 + 46.1 \approx 29 + 46 = 75$$

Add 28.6 and 46.1 to verify our estimation.

$$\begin{array}{r} 28.6 \\ + 46.1 \\ \hline 74.7 \end{array}$$

As 74.7 is close to 75, so our estimated value is correct.

e) $11.9 + 77.9$

Solution:

Round off these decimals to the nearest whole numbers.

$$11.9 \approx 12, \quad 77.9 \approx 78$$

add these whole numbers to estimate the sum.

$$\begin{array}{r} 12 \\ + 78 \\ \hline 90 \end{array}$$

$$11.9 + 77.9 \approx 12 + 78 = 90$$

Add 11.9 and 77.9 to verify our estimation.

$$\begin{array}{r} 11.9 \\ + 77.9 \\ \hline 89.8 \end{array}$$

As $89.8 \approx 90$, so our estimated is correct.

f) $98.98 + 12.65$

Solution:

Round off these decimals to the nearest whole numbers.

$$98.98 \approx 99, \quad 12.65 \approx 13$$

add these whole numbers to estimate the sum.

$$\begin{array}{r} 99 \\ + 13 \\ \hline 112 \end{array}$$

$$98.98 + 12.65 \approx 99 + 13 = 112$$

Add 98.98 and 12.65 to verify our estimation.

$$\begin{array}{r} 98.98 \\ + 12.65 \\ \hline 111.63 \end{array}$$

As 111.63 is close to 112 so our estimated is correct.

2. Estimate these differences and then verify your estimation by actual calculation.

a) $23.56 - 18.2$

Solution:

First, round off the two decimals to the nearest whole number

$$23.56 \approx 24, \quad 18.2 \approx 18$$

Subtract these whole numbers to estimate the difference

$$\begin{array}{r} 24 \\ - 18 \\ \hline 06 \end{array}$$

$$23.56 - 18.2 \approx 24 - 18 = 6$$

Subtract 23.56 and 18.2 to verify the estimated answer is correct.

$$\begin{array}{r} 23.56 \\ - 18.2 \\ \hline 5.36 \end{array}$$

As 5.36 is

b) $56.21 - 31.11$

Solution:

First, round off these decimals to the nearest whole number

$$56.21 \approx 56, \quad 31.11 \approx 31$$

Subtract these whole numbers to estimate the difference

$$\begin{array}{r} 56 \\ - 31 \\ \hline 25 \end{array}$$

$$56.21 - 31.11 \approx 56 - 31 = 25$$

Now subtract 56.21 and 31.11 to verify the estimated answer.

$$\begin{array}{r} 56.21 \\ - 31.11 \\ \hline 25.10 \end{array}$$

As 25.10 is approximately equal to 25, so our estimated answer is correct.

c) $98.76 - 62.33$

Solution:

First, round off these decimals to nearest whole number

$$98.76 \approx 99, \quad 62.33 \approx 62$$

These whole numbers to estimate the difference

$$\begin{array}{r} 99 \\ - 62 \\ \hline 37 \end{array}$$

$$98.76 - 62.33 \approx 99 - 62 = 37$$

Now Subtract 98.76 and 62.33 to verify our estimated.

$$\begin{array}{r} 98.76 \\ + 32.33 \\ \hline 36.43 \end{array}$$

As 36.43

d) $75.45 - 32.28$

Solution:

First, round off these number to nearest whole number

$$75.45 \approx 75, \quad 32.28 \approx 32$$

These whole numbers to estimate the difference

$$\begin{array}{r} 75 \\ - 32 \\ \hline 43 \end{array}$$

$$75.45 - 32.28 \approx 75 - 32 = 43$$

Subtract 75.45 and 32.28 to verify our estimated.

$$\begin{array}{r} 75.45 \\ + 32.28 \\ \hline 43.17 \end{array}$$

As 43.17 is approximately equal to 43, so our estimated value is correct.

e) $15.24 - 11.59$

Solution:

First, round off these decimals to nearest whole number

$$15.24 \approx 15, \quad 11.59 \approx 12$$

Now subtract these two whole numbers to estimate our answer

$$\begin{array}{r} 15 \\ - 12 \\ \hline 3 \end{array}$$

$$15.24 - 11.59 \approx 15 - 12 = 3$$

Subtract 15.24 and 11.59 to verify our estimated.

$$\begin{array}{r} 15.24 \\ + 11.59 \\ \hline 3.65 \end{array}$$

As 3.65 is

f) $87.49 - 70.67$

Solution:

First, round off these two decimals to nearest whole number

$$87.49 \approx 87, \quad 70.67 \approx 71$$

Now subtract these whole numbers to estimate our answer

$$\begin{array}{r} 87 \\ - 71 \\ \hline 16 \end{array}$$

$$87.49 - 70.67 \approx 87 - 71 = 16$$

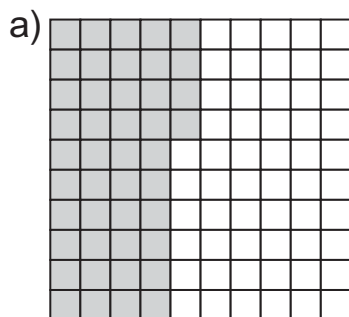
Now subtract 87.49 and 70.67 to verify our estimated.

$$\begin{array}{r} 87.49 \\ + 70.67 \\ \hline 158.16 \\ \hline \end{array}$$

As 16.82 is

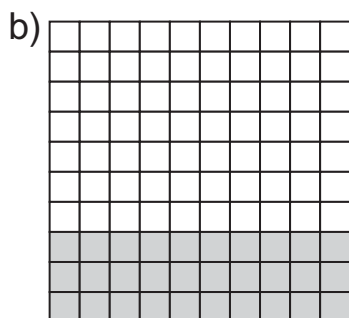
Learning Check 4.8

1. The following shapes are divided into 100 equal parts. Write the percentage of the coloured parts for each.



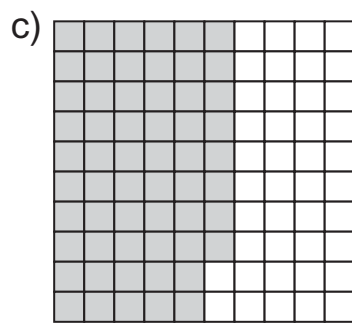
As 44 out of 100 equal parts are coloured, so 44% of the shape is coloured.

44%



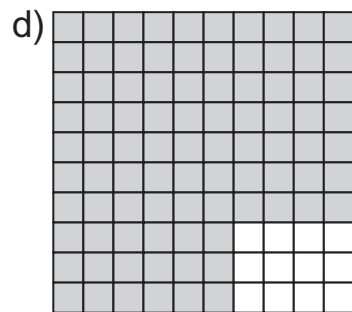
As 30 out of 100 equal parts are coloured, so 30% of the shape is coloured.

30%



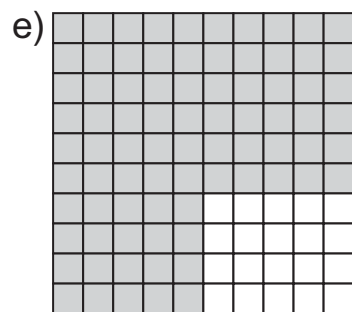
58%

As 58 out of 100 equal parts are coloured, so 58% of the shape is coloured.



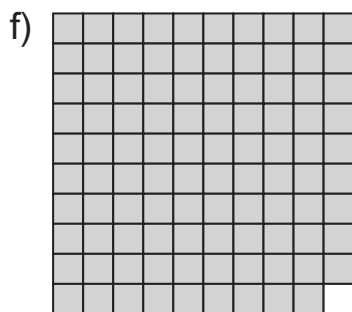
88%

As 88 out of 100 equal parts are coloured, so 88% of the shape is coloured.



80%

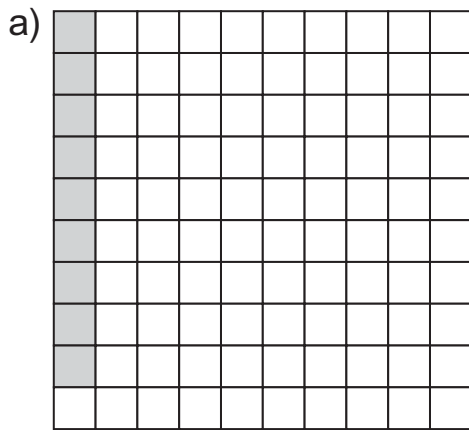
As 80 out of 100 equal parts are coloured, so 80% of the shape is coloured.



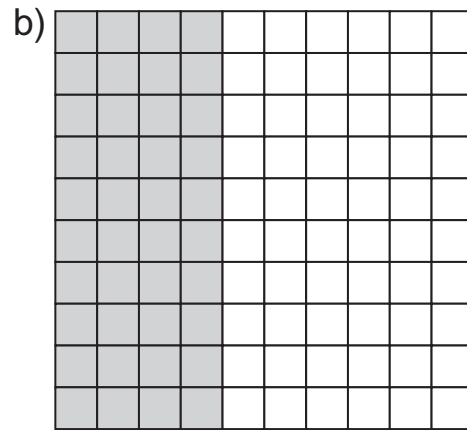
99%

As 99 out of 100 equal parts are coloured, so 99% of the shape is coloured.

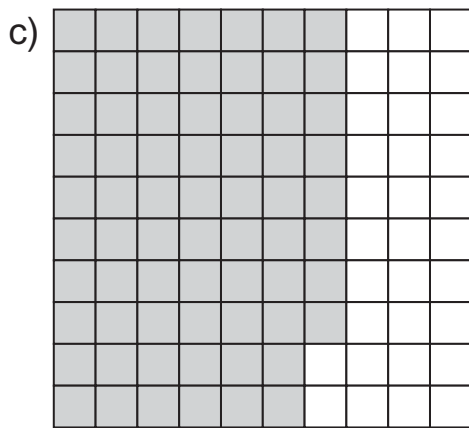
2. Colour the squares according to the given percentages.



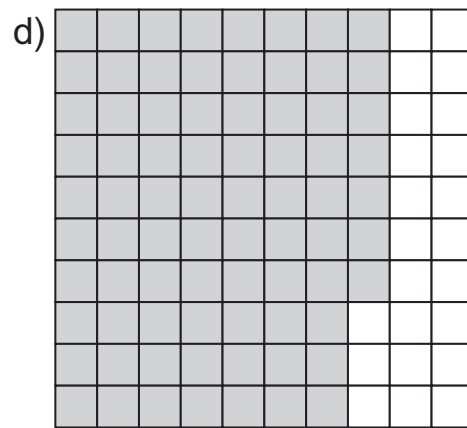
9%



40%



68%



77%

3. Write the following as percentage.

- a) 3 out of 100 13%.
- b) 15 out of 100 15%.
- c) 77 out of 100 77%.
- d) 90 out of 100 90%.
- e) 100 out of 100 100%.

Learning Check 4.9

1. Convert the following percentages into fractions.

a) 55%

Solution:

$$\begin{aligned} &55\% \\ &= \frac{55}{100} \\ &= \frac{11}{20} \text{ (simplest form)} \end{aligned}$$

b) 34%

Solution:

$$\begin{aligned} &34\% \\ &= \frac{34}{100} \\ &= \frac{17}{50} \end{aligned}$$

c) 73%

Solution:

$$\begin{aligned} &73\% \\ &= \frac{73}{100} \end{aligned}$$

d) 67%

Solution:

$$\begin{aligned} &67\% \\ &= \frac{67}{100} \end{aligned}$$

e) 29%

Solution:

$$\begin{aligned} &29\% \\ &= \frac{29}{100} \end{aligned}$$

f) 11%

Solution:

$$\begin{aligned} &11\% \\ &= \frac{11}{100} \end{aligned}$$

g) 52%

Solution:

$$\begin{aligned} &52\% \\ &= \frac{52}{100} \\ &= \frac{13}{25} \end{aligned}$$

h) 89%

Solution:

$$\begin{aligned} &89\% \\ &= \frac{89}{100} \end{aligned}$$

2. Convert the following fractions into percentages.

a) $\frac{3}{25}$

Solution:

$$\begin{aligned} &\frac{3}{25} \\ &= \frac{3}{\cancel{25}_1} \times \overset{4}{\cancel{100}} \% \\ &= 3 \times 4 \% \\ &= 12 \% \end{aligned}$$

b) $\frac{8}{10}$

Solution:

$$\begin{aligned} &\frac{8}{10} \\ &= \frac{8}{\cancel{10}_1} \times \overset{10}{\cancel{100}} \% \\ &= 8 \times 10 \% \\ &= 80 \% \end{aligned}$$

c) $\frac{28}{25}$

Solution:

$$\begin{aligned} &\frac{28}{25} \\ &= \frac{28}{\cancel{25}_1} \times \overset{4}{\cancel{100}} \% \\ &= 28 \times 4 \% \\ &= 112 \% \end{aligned}$$

$$d) \frac{17}{100}$$

Solution:

$$\frac{17}{100}$$

$$= \frac{17}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 17 \times 1 \%$$

$$= 17 \%$$

$$e) \frac{29}{25}$$

Solution:

$$\frac{29}{25}$$

$$= \frac{29}{\cancel{25}_1} \times \cancel{100}^4 \%$$

$$= 29 \times 4 \%$$

$$= 116 \%$$

$$f) \frac{11}{100}$$

Solution:

$$\frac{11}{100}$$

$$= \frac{11}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 11 \times 1 \%$$

$$= 11 \%$$

$$g) \frac{4}{5}$$

Solution:

$$\frac{4}{5}$$

$$= \frac{4}{\cancel{5}_1} \times \cancel{100}^{20} \%$$

$$= 4 \times 20 \%$$

$$= 80 \%$$

$$h) \frac{49}{50}$$

Solution:

$$\frac{49}{50}$$

$$= \frac{49}{\cancel{50}_1} \times \cancel{100}^2 \%$$

$$= 49 \times 2 \%$$

$$= 98 \%$$

3. Convert the following fractions into percentages into decimals.

$$a) 4\%$$

Solution:

$$4\%$$

$$= \frac{4}{100}$$

$$= 0.04 \left(\begin{array}{l} \text{when we divide} \\ \text{a number by 100} \\ \text{we simply shift} \\ \text{the decimal point} \\ \text{2 digits to the left} \\ \underline{4} \div 100 = 0.04 \end{array} \right)$$

$$b) 60\%$$

Solution:

$$60\%$$

$$= \frac{60}{100}$$

$$= 0.60 \left(\begin{array}{l} \underline{60} \div 100 \\ = 0.60 \end{array} \right)$$

c) 59%

Solution:

59%

$$= \frac{59}{100}$$

$$= 0.59$$

d) 65%

Solution:

65%

$$= \frac{65}{100}$$

$$= 0.65$$

e) 94%

Solution:

94%

$$= \frac{94}{100}$$

$$= 0.94$$

f) 26%

Solution:

26%

$$= \frac{26}{100}$$

$$= 0.26$$

g) 77%

Solution:

77%

$$= \frac{77}{100}$$

$$= 0.77$$

h) 2%

Solution:

2%

$$= \frac{2}{100}$$

$$= 0.02$$

4. Convert the following decimals into percentages.

a) 5.14

Solution:

5.14

$$\frac{514}{100}$$

$$= \frac{514}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 514 \%$$

b) 5.43

Solution:

5.43

$$\frac{543}{100}$$

$$= \frac{543}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 543 \%$$

c) 1.72

Solution:

1.72

$$\frac{172}{100}$$

$$= \frac{172}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 172 \%$$

d) 3.12

Solution:

3.12

$$\frac{312}{100}$$

$$= \frac{312}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 312 \%$$

e) 2.28

Solution:

2.28

$$\frac{228}{100}$$

$$= \frac{228}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 228 \%$$

f) 2.67

Solution:

2.67

$$\frac{267}{100}$$

$$= \frac{267}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 267 \%$$

g) 0.09

Solution:

0.09

$$\frac{9}{100}$$

$$= \frac{9}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 9 \%$$

h) 4.78

Solution:

4.78

$$\frac{478}{100}$$

$$= \frac{478}{\cancel{100}_1} \times \cancel{100}^1 \%$$

$$= 478 \%$$

Learning Check 4.10

1. A factory produced 900 machines in a certain week. 4% of the machines have defects in them. How many machines have defects?

Solution:

Total number of machines produced = 900

percentage of machine having defects = 4%

Number of machines having defects = 4% of 900

$$= \frac{4}{100} \text{ of } 900 \%$$

$$= \frac{4}{\cancel{100}_1} \times \cancel{900}^9 \%$$

$$= 4 \times 9 = 36$$

So, 36 machines have defects in them.

2. The original price of a laptop was Rs 85,320. If it was sold at a discount of 40% during a sale, find the price of the laptop during the sale.

Solution:

Original price of a laptop = Rs, 85,320

Percentage of discount on the laptop = 40%

Amount of discount on the laptop = 40% of 85,320

$$= \frac{\cancel{40}^2}{\cancel{100}_5} \times 85,320$$

$$= \frac{2}{\cancel{5}_1} \times \cancel{85,320}^{17064}$$

$$= 2 \times 17064 = 34,128$$

So, amount of discount was Rs. 34 r 128.

$$\begin{aligned}
 \text{Now, price of laptop during sale} &= \text{Original price amount of discount} \\
 &= \text{Rs } 85,320 - \text{Rs } 34,128 \\
 &= \text{Rs } 51,192
 \end{aligned}$$

Calculations:

$$\begin{array}{r}
 85320 \\
 - 34128 \\
 \hline
 51192
 \end{array}$$

So, the price of the laptop during sale is Rs 51,192.

- 3. Ibrahim saved Rs 2500 in a certain month from his pocket money. He spent 32% of his savings distributing stationery items among needy kids. What amount does he have left?**

Solution:

$$\begin{aligned}
 \text{Ibrahim's savings} &= \text{Rs, } 2500 \\
 \text{Percentage of saving he spent} &= 32\% \\
 \text{Amount of savings he spent} &= 32\% \text{ of } 2500 \\
 &= \frac{32}{100} \text{ of } 2500 \\
 &= \frac{32}{100} \times 2500 \\
 &= 32 \times 25 \\
 &= 800
 \end{aligned}$$

So, Ibrahim spent Rs 800 out of his saving.

$$\begin{aligned}
 \text{The amount left after spending} &= \text{Total savings} - \text{amount spent} \\
 &= \text{Rs } 2500 - \text{Rs } 800 \\
 &= \text{Rs } 1700
 \end{aligned}$$

So, Rs 1700 are left with Ibrahim after spending.

Calculations:

$$\begin{array}{r}
 2500 \\
 - 800 \\
 \hline
 1700
 \end{array}$$

4. There are 740 cars parked in a multi-storey car park having a basement, ground floor and first floor. If 45% of the cars are parked on the first floor and 20% are on the ground floor, then find:

Solution:

$$\begin{aligned}\text{Total number of cars in the parking} &= 740 \\ \text{Percentage of cars on first floor} &= 45\% \\ \text{Percentage of cars on ground floor} &= 20\% \\ \text{Percentage of cars on basement} &= 100 - (45 + 20) \\ &= 100 - 65 \\ &= 35\%\end{aligned}$$

(We are already given the % of cars on ground and first floor.
We subtract the sum of these two percentages from 100 to get the
percentage of cars in the basement, $45\% + 20\% + 35\% = 100\%$)

- a) How many cars are parked in the basement?

Solution:

$$\begin{aligned}\text{Total number of cars in the car parking} &= 740 \\ \text{Percentage of cars in the basement} &= 35\% \\ \text{Number of cars in the basement} &= 35\% \text{ of } 740 \\ &= \frac{35}{100} \text{ of } 740 \\ &= \frac{35}{100} \times 740 \\ &= \frac{35^7}{51_1} \times 37 \\ &= 7 \times 37 \\ &= 259\end{aligned}$$

So, 259 cars are parked in the basement.

- b) How many cars are parked on the ground floor?

Solution:

$$\begin{aligned}\text{Total number of cars in the car parking} &= 740 \\ \text{Percentage of cars on the ground floor} &= 20\% \\ \text{Number of cars on the ground floor} &= 20\% \text{ of } 740 \\ &= \frac{20}{100} \text{ of } 740\end{aligned}$$

$$\begin{aligned}
 &= \frac{\cancel{20}^1}{\cancel{100}_5} \times 740 \\
 &= \frac{1}{\cancel{5}_1} \times \cancel{740}^{148} \\
 &= 148
 \end{aligned}$$

So, 148 cars are parked on the ground floor.

c) How many cars are parked on the first floor?

Solution:

$$\begin{aligned}
 \text{Total number of cars in the car parking} &= 740 \\
 \text{Percentage of cars in the first floor} &= 45\% \\
 \text{Number of cars in the first floor} &= 45\% \text{ of } 740 \\
 &= \frac{45}{100} \text{ of } 740 \\
 &= \frac{45}{\cancel{100}_5} \times \cancel{740}^{37} \\
 &= \frac{\cancel{45}^9}{\cancel{5}_1} \times 37 \\
 &= 9 \times 37 \\
 &= 333
 \end{aligned}$$

So, the numbers of cars on the first floor is 333.

Unit Check 4

1. Encircle the correct options.

- a) (ii) 45.1
- b) (i) 1
- c) (iv) 1000
- d) (ii) 100
- e) (iii) 10.432

2. Compare and write $<$, $>$ or $=$.

a) 34.5 ____ 23.9

Solution:

Compare the digits at tens place. As $3 > 2$, so

$$34.5 \boxed{>} 23.9$$

b) 4.88 ____ 4.89

Solution:

As digits in the ones and tenths place are same, compare the digits in the hundredths place. As $8 < 9$, so

$$4.88 \boxed{<} 4.89$$

c) 5.55 ____ 5.55

Solution:

As digits in all the places are same, so

$$5.55 \boxed{=} 5.55$$

d) 7.31 ____ 7.41

Solution:

As digits in the ones place are same, we compare digits in the tenth place. As $3 < 4$, so

$$7.31 \boxed{<} 7.41$$

e) 6.32 ____ 6.32

Solution:

As all the digits in all the places are same, so,

$$6.32 \boxed{=} 6.32$$

f) 1.94 ____ 1.99

Solution:

As the digits in the ones and tenths place are same, we compare the digits in the hundredths place. As $4 < 9$, so

$$1.94 \boxed{<} 1.99$$

3. Compare and arrange these decimal numbers in ascending and descending order.

a) 2.14, 3.24, 1.35

Solution:

Compare the digits in the ones place. As $3 > 2$ and $3 > 1$, so 3.24 is the greatest number. As $1 < 3$, and $1 < 2$, so 1.35 is the smallest number.

$$3.24 > 2.14 > 1.35$$

Ascending order: 1.35 , 2.14 , 3.24

Descending order: 3.24 , 2.14 , 1.35

b) 3,54, 7,64, 7.44

Solution:

As the digits in the ones place are same, compare the digits in the tenths place. As $6 > 5 > 4$, so

$$7.64 > 7.54 > 7.44$$

Ascending order: 7.44 , 7.54 , 7.64

Descending order: 7.64 , 7.54 , 7.44

c) 6.65, 6.63, 6.69

Solution:

As the digits in the ones and tenths place are same, compare the digits in the hundredths place. As $9 > 5 > 3$, so

$$6.69 > 6.65 > 6.63$$

Ascending order: 6.63 , 6.65 , 6.69

Descending order: 6.69 , 6.65 , 6.63

4. Add the following.

a) $65.32 + 89.34$

Solution:

$$\begin{array}{r} 65.32 \\ + 89.34 \\ \hline 154.66 \end{array}$$

b) $0.009 + 7.008$

Solution:

$$\begin{array}{r} 0.009 \\ + 7.008 \\ \hline 7.017 \end{array}$$

5. Subtract the following.

a) $5.982 - 2.198$

Solution:

$$\begin{array}{r} \text{ones} \\ \text{decimal} \\ \text{tenths} \\ \text{hundredths} \\ \text{thousandths} \\ 5.982 \\ - 2.198 \\ \hline 3.784 \end{array}$$

b) $15.39 - 7.209$

Solution:

$$\begin{array}{r} \text{tens} \\ \text{ones} \\ \text{decimal} \\ \text{tenths} \\ \text{hundredths} \\ \text{thousandths} \\ 15.390 \\ - 7.209 \\ \hline 8.181 \end{array} \left(\begin{array}{l} \text{suppose there is a} \\ \text{"0" at thousandths} \\ \text{place to make our} \\ \text{calculation easier.} \end{array} \right)$$

6. Multiply the following.

a) 3.83×10

Solution:

$$\begin{array}{l} 3.83 \times 10 \\ \quad \quad \quad \curvearrowright \\ = 38.3 \end{array}$$

b) 7.34×100

Solution:

$$\begin{array}{l} 7.34 \times 100 \\ \quad \quad \quad \curvearrowright \quad \curvearrowright \\ = 734.0 \quad \text{or} \quad 734 \end{array}$$

c) 9.77×1000

Solution:

$$\begin{array}{l} 9.77 \times 1000 \\ \quad \quad \quad \curvearrowright \quad \curvearrowright \quad \curvearrowright \\ = 9770.0 \quad \text{or} \quad 9770 \end{array}$$

d) 4.92×27 ————— or ————— 4.92×27

Solution:

$$\begin{array}{l} 4.92 \times 27 \\ = \frac{492 \times 27}{100} \\ = \frac{13284}{100} \quad \text{or} \quad 13284 \div 100 \\ = 132.84 \end{array}$$

$$\begin{array}{r} \text{ones} \\ \text{decimal point} \\ \text{tenths} \\ \text{hundredths} \\ 4.92 \quad \leftarrow \text{2d.p.} \\ \times \quad 27 \\ \hline 3444 \\ 9840 \\ \hline 132.84 \quad \leftarrow \text{2d.p.} \end{array}$$

e) 6.92×1.22 ————— or ————— 6.92×1.22

Solution:

$$\begin{aligned} &6.92 \times 1.22 \\ &= \frac{692}{100} \times \frac{122}{100} \\ &= \frac{692 \times 122}{100 \times 100} \\ &= \frac{84424}{10000} \text{ or } 84424 \div 10000 \\ &= 8.4424 \end{aligned}$$

$$\begin{array}{r} \text{ones} \\ \text{decimal point} \\ \text{tenths} \\ \text{hundredths} \\ 6.92 \leftarrow 2\text{d.p.} \\ \times 1.22 \leftarrow 2\text{d.p.} \\ \hline 1384 \\ 13840 \\ 69200 \\ \hline 8.4424 \leftarrow 4\text{d.p.} \end{array}$$

f) 8.42×0.67 ————— or ————— 8.42×0.67

Solution:

$$\begin{aligned} &8.42 \times 0.67 \\ &= \frac{842}{100} \times \frac{67}{100} \\ &= \frac{842 \times 67}{100 \times 100} \\ &= \frac{56414}{10000} \text{ or } 56414 \div 10000 \\ &= 5.6414 \end{aligned}$$

$$\begin{array}{r} \text{ones} \\ \text{decimal point} \\ \text{tenths} \\ \text{hundredths} \\ 8.42 \leftarrow 2\text{d.p.} \\ \times .67 \leftarrow 2\text{d.p.} \\ \hline 5894 \\ 50520 \\ \hline 5.6414 \leftarrow 4\text{d.p.} \end{array}$$

7. Divide the following.

a) 5.61×10

Solution:

$$\begin{aligned} &\curvearrowright 5.61 \times 10 \\ &= 0.561 \end{aligned}$$

b) 9.63×100

Solution:

$$\begin{aligned} &\curvearrowright 9.63 \times 100 \\ &= 0.0963 \end{aligned}$$

c) 6.98×1000

Solution:

$$\begin{aligned} &\curvearrowright 6.98 \times 1000 \\ &= 0.00698 \end{aligned}$$

d) $7.89 \div 15$

Solution:

$$\begin{aligned} &7.89 \div 15 \\ &= \frac{789}{100} \div 15 \\ &= \frac{789}{100} \times \frac{1}{15} \\ &= \frac{789 \times 1}{100 \times 15} \\ &= \frac{789}{1500} \end{aligned}$$

Calculation

$$\begin{array}{r} 0.526 \\ 1500 \overline{) 7890} \\ \underline{- 7500} \\ 3900 \\ \underline{- 3000} \\ 9000 \\ \underline{- 9000} \\ 0 \end{array}$$

————— or —————
 $7.89 \div 15$

$$\begin{array}{r} 0.526 \\ 15 \overline{) 7.89} \\ \underline{- 75} \\ 39 \\ \underline{- 30} \\ 90 \\ \underline{- 90} \\ 0 \end{array}$$

So, $7.89 \div 15 = 0.526$

e) $9.82 \div 2.5$

Solution:

$$\begin{aligned} & 9.82 \div 2.5 \\ &= \frac{982}{100} \div \frac{25}{10} \\ &= \frac{982}{100} \times \frac{10}{25} \\ &= \frac{982 \times 10}{100 \times 25} \\ &= \frac{9820}{2500} \\ &= 3.928 \end{aligned}$$

Calculation	
	3.928
2500)	9820
	- 7500
	23200
	- 22500
	7000
	- 5000
	20000
	- 20000
	0

$$\begin{aligned} & 9.82 \div 2.5 \\ &= \frac{9.82}{2.5} \\ &= \frac{9.82}{2.5} \times \frac{10}{10} \\ &= \frac{9.82 \times 10}{2.5 \times 10} \\ &= \frac{98.2}{25} \\ &= 3.928 \end{aligned}$$

or

Calculation	
	3.928
25)	98.2
	- 75 ↓
	232
	- 225
	70
	- 50
	200
	- 200
	0

So, $98.2 \div 25 = 3.928$

f) $9.12 \div 7.6$

Solution:

$$\begin{aligned} & 9.12 \div 7.6 \\ &= \frac{912}{100} \div \frac{76}{10} \\ &= \frac{912}{100} \times \frac{10}{76} \\ &= \frac{912 \times 10}{100 \times 76} \\ &= \frac{9120}{7600} \\ &= 1.2 \end{aligned}$$

Calculation	
	1.2
7600)	9120
	- 7600
	15200
	- 15200
	0

_____ or _____

$$\begin{aligned} & 9.12 \div 7.6 \\ &= \frac{9.12}{7.6} \\ &= \frac{9.12}{7.6} \times \frac{10}{10} \\ &= \frac{91.2}{76} \\ &= 1.2 \end{aligned}$$

Calculation	
	1.2
76)	91.2
	- 76 ↓
	152
	- 152
	0

So, $9.12 \div 7.6 = 1.2$

8. Convert the following fractions into decimal numbers.

a) $\frac{3}{7}$

Solution:

$$\frac{3}{7}$$

Write 3 as 3.0 to make the calculation easier.

$$\begin{array}{r} 0.4285 \\ 7 \overline{) 3.0} \\ \underline{-0} \downarrow \\ 30 \\ \underline{-28} \\ 20 \\ 14 \\ \underline{60} \\ 56 \\ \underline{40} \\ 35 \\ \underline{35} \\ 0 \end{array}$$

So, $\frac{3}{7} = 0.4285$ or
0.429

(rounded off to nearest hundredth)

b) $\frac{8}{5}$

Solution:

$$\frac{8}{5}$$

Write 8 as 8.0 to make the calculation easier.

$$\begin{array}{r} 1.6 \\ 5 \overline{) 8.0} \\ \underline{-5} \downarrow \\ 30 \\ \underline{-30} \\ 0 \end{array}$$

So, $\frac{8}{5} = 1.6$

c) $\frac{3}{4}$

Solution:

$$\frac{3}{4}$$

Write 3 as 3.0 to make our calculation easier.

$$\begin{array}{r} 0.75 \\ 4 \overline{) 3.0} \\ \underline{-0} \downarrow \\ 30 \\ \underline{-28} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

So, $\frac{3}{4} = 0.75$

9. Round off the following decimals to the nearest tenth and hundredth.

Round off to the nearest hundredth

Round off to the nearest hundredth

- (a) 7.245 As the digit in the hundredth place is less than 5, so we keep the tenth place digit unchanged and remove all the digits to its right

$$7.245 \approx 7.2$$

- As the digit in the thousandths place is equal to 5, we add 1 to the hundredths place digit and remove next digit to its right

$$7.245 \approx 7.25$$

7.24
+ 1
7.25

- (b) 21.897 As the digit in the hundredths place is greater than 5, we add 1 to the tenths place digit and remove all the digits to its right.

$$21.897 \approx 21.9$$

21.8
+ 1
21.9

- As the digit in the thousandths place is greater than 5, we add 1 to the hundredths place digit and remove the digit to its right.

$$21.897 \approx 21.90$$

or 21.9

21.89
+ 1
21.90

- (c) 5.327 As the digit in the hundredths place is less than 5, we keep the tenths place digit unchanged and remove all the digits to its right.

$$5.327 \approx 5.3$$

- As the digit in the thousandths place is greater than 5, we add 1 to the hundredths place digit and remove all digits to its right.

$$5.327 \approx 5.33$$

5.32
+ 1
5.33

10. Estimate these sums and differences and then verify your estimation by actual calculation.

a) $18.34 + 56.31$

Solution:

First round off these decimals to the nearest whole numbers.

$$18.34 \approx 18$$

$$56.31 \approx 56$$

Add these whole numbers to estimate our sum.

$$\begin{array}{r} \textcircled{1} 18 \\ + 56 \\ \hline 74 \end{array}$$

$$18.34 + 56.31 \approx 18 + 56 = 74$$

Now add 18.34 and 56.31 to verify our estimation.

As 74.65 is

$$\begin{array}{r} \textcircled{1} 18.34 \\ + 56.31 \\ \hline 74.65 \end{array}$$

b) $2.87 + 3.17$

Solution:

First round off these decimals to the nearest whole numbers.

$$2.87 \approx 3$$

$$3.17 \approx 3$$

Add these whole numbers to estimate the sum.

$$\begin{array}{r} 3 \\ + 3 \\ \hline 6 \end{array}$$

$$2.87 + 3.17 \approx 3 + 3 = 6$$

Now add 2.87 and 3.17 to verify our estimation.

$$\begin{array}{r} \textcircled{1} \textcircled{1} \\ 2.87 \\ + 3.17 \\ \hline 6.04 \end{array}$$

As 6.04 is approximately equal to 6, so our estimated value is correct.

c) $94.80 - 89.19$

Solution:

Round off these decimals to the nearest whole number.

$$94.80 \approx 95$$

$$89.19 \approx 89$$

Subtract these whole numbers to estimate the difference.

$$\begin{array}{r} 95 \\ - 89 \\ \hline 6 \end{array}$$

$$94.80 - 89.19 \approx 95 - 89 = 6$$

Subtract 94.80 and 89.19 to verify our estimation.

$$\begin{array}{r} 94.80 \\ - 89.19 \\ \hline 5.61 \end{array}$$

As 5.61 is close to 6, our estimation is correct.

d) $4.87 - 2.12$

Solution:

Round off these decimals to the nearest whole number.

$$4.87 \approx 5$$

$$2.12 \approx 2$$

Subtract these two numbers to estimate the difference.

$$\begin{array}{r} 5 \\ - 2 \\ \hline 3 \end{array}$$

$$4.87 - 2.12 \approx 5 - 2 = 3$$

Subtract 4.87 and 2.12 to verify our estimation.

$$\begin{array}{r} 4.87 \\ - 2.12 \\ \hline 2.75 \end{array}$$

As 2.75 is close to 3, our estimation is correct.

11. Convert the following percentages into fractions.

a) 56%

Solution:

$$\begin{aligned} & 56\% \\ &= \frac{56}{100} \\ &= \frac{14}{25} \end{aligned}$$

b) 98%

Solution:

$$\begin{aligned} & 98\% \\ &= \frac{98}{100} \\ &= \frac{49}{50} \end{aligned}$$

c) 22%

Solution:

$$\begin{aligned} & 22\% \\ &= \frac{22}{100} \\ &= \frac{11}{50} \end{aligned}$$

12. Convert the following fractions into percentages.

a) $\frac{7}{25}$

Solution:

$$\begin{aligned} &= \frac{7}{25} \\ &= \frac{7}{\cancel{25}_1} \times \overset{4}{100}\% \\ &= 7 \times 4\% \\ &= 28\% \end{aligned}$$

b) $\frac{4}{50}$

Solution:

$$\begin{aligned} &= \frac{4}{50} \\ &= \frac{4}{\cancel{50}_1} \times \overset{2}{100}\% \\ &= 4 \times 2\% \\ &= 8\% \end{aligned}$$

c) $\frac{15}{500}$

Solution:

$$\begin{aligned} &= \frac{15}{500} \\ &= \frac{15}{\cancel{500}_5} \times \overset{1}{100}\% \\ &= \overset{3}{\cancel{15}_5} \times 1\% \\ &= 3 \times 1\% = 3\% \end{aligned}$$

13. Convert the following percentage into decimals.

a) 76%

Solution:

$$\begin{aligned} & 76\% \\ &= \frac{76}{100} \\ &= (76 \div 100) \\ &= 0.76 \end{aligned}$$

b) 45%

Solution:

$$\begin{aligned} & 45\% \\ &= \frac{45}{100} \\ &= (\overset{4}{\cancel{45}} \div 100) \\ &= 0.45 \end{aligned}$$

c) 72%

Solution:

$$\begin{aligned} & 72\% \\ &= \frac{72}{100} \\ &= (\overset{7}{\cancel{72}} \div 100) \\ &= 0.72 \end{aligned}$$

14. Convert the following decimals into percentages.

a) 7.89

Solution:

$$\begin{aligned} & 7.89 \\ &= \frac{789}{100} \\ &= \frac{789}{\cancel{100}_1} \times \overset{1}{100}\% \\ &= 7.89\% \end{aligned}$$

b) 0.05

Solution:

$$\begin{aligned} & 0.05 \\ &= \frac{5}{100} \\ &= \frac{5}{\cancel{100}_1} \times \overset{1}{100}\% \\ &= 5\% \end{aligned}$$

c) 3.94

Solution:

$$\begin{aligned} & 3.94 \\ &= \frac{394}{100} \\ &= \frac{394}{\cancel{100}_1} \times \overset{1}{100}\% \\ &= 394\% \end{aligned}$$

- 15. The capacity of a bottle is 3.6 liters and the capacity of a glass is 0.6 liters. How many glasses can fill one bottle of water?**

Solution:

$$\begin{aligned}
 \text{Capacity of a bottle} &= 3.6 \ell \\
 \text{Capacity of a glass} &= 0.6 \ell \\
 \text{Number of glasses that can fill a bottle} &= 3.6 \div 0.6 \\
 &= \frac{36}{10} \div \frac{6}{10} \\
 &= \frac{36}{10} \times \frac{10}{6} \\
 &= \frac{36 \times 10}{10 \times 6} \\
 &= \frac{\cancel{36}^6}{\cancel{60}^1} = 6
 \end{aligned}$$

- 16. The volume of oil in a tank is 57.2 liters. Find:**

Solution:

$$\begin{aligned}
 \text{a) Volume of oil in a tank} &= 57.2 \ell \\
 \text{Number of containers} &= 15 \\
 \text{Volume of oil in 15 container} &= 57.2 \times 15 \\
 &= 858 \\
 \text{So, there will be 858 litres of oil in 15 tanks.}
 \end{aligned}$$

Calculation

$$\begin{array}{r}
 57.2 \\
 \times 15 \\
 \hline
 2860 \\
 5720 \\
 \hline
 858.0
 \end{array}$$

$$\begin{aligned}
 \text{b) Volume of oil in a tank} &= 57.2 \ell \\
 \text{Number of containers} &= 5 \\
 \text{Volume of oil in each container} &= 57.2 \div 5 \\
 &= \frac{572}{10} \times \frac{1}{5} \\
 &= \frac{572 \times 1}{10 \times 5} \\
 &= \frac{572}{50}
 \end{aligned}$$

So, 11.44 litres of oil will be there in each container.

Calculation

$$\begin{array}{r}
 11.44 \\
 50 \overline{) 572} \\
 \underline{- 50} \downarrow \\
 72 \\
 \underline{- 50} \\
 220 \\
 \underline{- 200} \\
 200 \\
 \underline{- 200} \\
 0
 \end{array}$$

17. Out of 6340 books in a school library, 20% are storybooks, 65% are textbooks and 15% are other books. Find:

$$\begin{aligned}
 \text{a) Total number of books} &= 6340 \\
 \text{Percentage of storybooks} &= 20\% \\
 \text{Number of story books} &= \frac{20}{100} \times 6340 \\
 &= \frac{20^1}{100_5} \times 6340 \\
 &= \frac{1}{5_1} \times 1268 \\
 &= 1 \times 1268 \\
 &= 1268
 \end{aligned}$$

So, there are 1268 story books.

$$\begin{aligned}
 \text{b) Total number of books} &= 6340 \\
 \text{Percentage of textbooks} &= 65\% \\
 \text{Number of textbooks} &= \frac{65}{100} \times 6340 \\
 &= \frac{65^{13}}{100_{20}} \times 6340 \\
 &= 13 \times 317 \\
 &= 13 \times 317 \\
 &= 4121
 \end{aligned}$$

So, there are 4121 textbooks.

$$\begin{aligned}
 \text{c) Total number of books} &= 6340 \\
 \text{Percentage of other books} &= 15\% \\
 \text{Number of other books} &= \frac{15}{100} \times 6340 \\
 &= \frac{15^{13}}{100_{20}} \times 6340 \\
 &= \frac{3}{20_1} \times 317 \\
 &= 3 \times 317 \\
 &= 951
 \end{aligned}$$

Unit 5: Distance and Time

Learning Check 5.1

1. Convert the following.

a) 54 km into m

Solution:

54 km

$$= 54 \times 1000 \text{ m}$$

$$= 54000 \text{ m}$$

b) 82 km into m

Solution:

82 km

$$= 82 \times 1000 \text{ m}$$

$$= 82000 \text{ m}$$

c) 102 km into m

Solution:

102 km

$$= 102 \times 1000 \text{ m}$$

$$= 102000 \text{ m}$$

d) 44 km 56 m into m

Solution:

44 km 56 m

$$= 44 \times 1000 + 56 \text{ m}$$

$$= 44000 \text{ m} + 56 \text{ m}$$

$$= 44056 \text{ m}$$

e) 100 km 234 m into m

Solution:

100 km 234 m

$$= 100 \times 1000 + 234 \text{ m}$$

$$= 100000 \text{ m} + 234 \text{ m}$$

$$= 100234 \text{ m}$$

f) 12 km 500 m into m

Solution:

12 km 500 m

$$= 12 \times 1000 \text{ m} + 500 \text{ m}$$

$$= 12000 \text{ m} + 500 \text{ m}$$

$$= 12500 \text{ m}$$

g) 62 m into km

Solution:

62 m

$$= \frac{62}{1000} \text{ km } (\underbrace{62 \div 1000})$$

$$= 0.062 \text{ km}$$

h) 46 m into km

Solution:

46 m

$$= \frac{46}{1000} \text{ km}$$

$$= 0.046 \text{ km}$$

i) 3801 m into km and m

Solution:

3801 m

$$= 3000 + 801 \text{ m}$$

$$= \frac{3000}{1000} \text{ km} + 801 \text{ m}$$

$$= 3 \text{ km } 801 \text{ m}$$

$\begin{array}{r} 3000 \\ + 801 \\ \hline 3801 \end{array}$

j) 48 m into cm

Solution:

48 m

$$= 48 \times 100 \text{ cm}$$

$$= 4800 \text{ cm}$$

k) 134 m into cm

Solution:

134 km

$$= 134 \times 100 \text{ m}$$

$$= 13400 \text{ m}$$

l) 18 m 56 cm into cm

Solution:

18 m 56 cm

$$= 18 \text{ m} \times 100 \text{ cm} + 56 \text{ cm}$$

$$= 1800 \text{ cm} + 56 \text{ cm}$$

$$= 1856 \text{ cm}$$

m) 99 m 15 cm into cm

Solution:

99 m 15 cm

$$= 99 \times 100 \text{ m} + 15 \text{ cm}$$

$$= 9900 \text{ cm} + 15 \text{ cm}$$

$$= 9915 \text{ cm}$$

n) 75 cm into m

Solution:

75 cm

$$= \frac{75}{100} \text{ m}$$

$$= 0.75 \text{ m}$$

o) 391 cm into m and cm

Solution:

391 cm

$$= 300 \text{ cm} + 91 \text{ cm}$$

$$= \frac{300}{100} \text{ m} + 91 \text{ cm}$$

$$= 3 \text{ m} + 91 \text{ cm}$$

$$= 3 \text{ m } 91 \text{ cm}$$

300
+ 91
391

p) 31 cm into mm

Solution:

31 cm

$$= 31 \times 10 \text{ mm} + 234 \text{ km}$$

$$= 310 \text{ mm}$$

q) 80 cm into mm

Solution:

80 cm

$$= 80 + 10 \text{ mm}$$

$$= 800 \text{ mm}$$

r) 17 cm 3 mm into mm

Solution:

17cm 3mm

$$= 17 \times 10 \text{ mm} + 3 \text{ mm}$$

$$= 170 \text{ mm} + 3 \text{ mm}$$

$$= 173 \text{ mm}$$

s) 8 mm into cm

Solution:

8 mm

$$= \frac{8}{10} \text{ cm}$$

$$= 0.8 \text{ cm}$$

t) 43 mm into cm and mm

Solution:

43 mm

= 40 mm + 3 mm

= $\frac{40}{10}$ cm + 3 mm

= 4.0 cm + 3 mm

= 4 cm + 3 mm

u) 98 mm into cm and mm

Solution:

98 mm

= 90 mm + 8 mm

= $\frac{90}{10}$ cm + 8 mm

= 9.0 cm + 8 mm

= 4 cm + 8 mm

Learning Check 5.2

1. The length of a masjid is 623 m 67 cm and its width is 475 m 79 cm.

What is the difference between its length and width in meters?

Solution:

Length of the masjid

= $\begin{array}{r} 622 \quad 100 \\ 623 \text{ m} \quad 67 \text{ cm} \end{array}$

Width of the masjid

= $\begin{array}{r} -475 \text{ m} \quad 79 \text{ cm} \end{array}$

Difference between length and width:

$\begin{array}{r} 147 \text{ m} \quad 88 \text{ cm} \end{array}$

borrowing
1 m-100 cm from
metres side as 67 is
smaller than 79

In metres: 147 m 88 cm

= $147 + \frac{88}{100}$ m

= 147 m + 0.88 m

= 147.88 m

So difference between the length and width of the masjid is 147.88 m.

2. The distance from city A to city B is 543 km 223 m and the distance from city B to city C is 216 km 675 m. Find the distance between city A to city C. Express the answer in kilometers.

Solution:

The distance from city A to city B =

$\begin{array}{r} 543 \text{ km} \quad 223 \text{ m} \end{array}$

Distance from city B to city C =

$\begin{array}{r} +216 \text{ km} \quad 675 \text{ m} \end{array}$

distance from city A to city C:

$\begin{array}{r} 759 \text{ km} \quad 898 \text{ m} \end{array}$

In kilometres: 759 km 898 m

= $759 \text{ km} + \frac{898}{1000} \text{ km}$

= 759 km + 0.898 km

= 759.898 km

So distance from city A to city C is 759 km 898 m or 759.898 km.

- 3. Zubair covers a distance of 8 km 740 m from his home to the masjid and covered a further 10 km 467 m from the masjid to the market. Find the total distance covered by him. Express the answer in meters.**

Solution:

Zubair covers from home to masjid =

$$\begin{array}{r} \textcircled{1} \quad 8 \text{ km} \quad 740 \text{ m} \\ + 10 \text{ km} \quad 467 \text{ m} \\ \hline 19 \text{ km} \quad 207 \text{ cm} \end{array}$$

Zubair covers from masjid to the market =

$$+ 10 \text{ km} \quad 467 \text{ m}$$

Total distance covered:

$$\hline 19 \text{ km} \quad 207 \text{ cm}$$

740 + 467 = 1207 m
we give 1000 m = 1 km
10 km side and only 207 m are remained.

In metres: 19 km 207 cm

$$= 19 \times 1000 \text{ m} + 207 \text{ m}$$

$$= 19000 + 207 \text{ m}$$

$$= 19207 \text{ m}$$

So the total distance covered by him is 19 km 207 m or 19207 m.

- 4. Sana has a piece of red cloth of length 6 m 89 cm and a piece of black cloth of length 8 m 54 cm. Find the total length of both pieces of cloth and write the answer in meters.**

Solution:

Length of red piece of cloth =

$$\begin{array}{r} \textcircled{1} \quad 6 \text{ m} \quad 89 \text{ m} \\ + 8 \text{ m} \quad 54 \text{ m} \\ \hline 15 \text{ m} \quad 43 \text{ cm} \end{array}$$

Length of black piece of cloth =

$$+ 8 \text{ m} \quad 54 \text{ m}$$

Total length of both piece:

$$\hline 15 \text{ m} \quad 43 \text{ cm}$$

We get 143 cm by adding 89 and 54, we give 100 cm = 1 m to metres side and 43 out of 143 cm are left on the cm side.

In metres: 15 m 43 cm

$$= 15 \text{ m} + 43 \text{ cm}$$

$$= 15 \text{ m} + 0.43 \text{ m}$$

$$= 15.43 \text{ m}$$

So that the total distance covered by him is 19 km 207 m or 19207 m.

Learning Check 5.3

1. Convert the following times.

a) 7 hours 23 minutes into minutes

Solution:

$$\begin{aligned} & 7 \text{ hrs } 23 \text{ min} \\ &= 7 \times 60 \text{ min} + 23 \text{ min} \\ &= 420 \text{ min} + 23 \text{ min} \\ &= 443 \text{ min} \end{aligned}$$

b) 56 hours 5 minutes into minutes

Solution:

$$\begin{aligned} & 56 \text{ hrs } 5 \text{ min} \\ &= 56 \times 60 \text{ min} + 5 \text{ min} \\ &= 3360 \text{ min} + 5 \text{ min} \\ &= 3365 \text{ min} \end{aligned}$$

c) 18 hours into minutes

Solution:

$$\begin{aligned} & 18 \text{ hours} \\ &= 18 \times 60 \text{ min} \\ &= 1080 \text{ min} \end{aligned}$$

d) 6630 minutes into hours

Solution:

$$\begin{aligned} 6630 \text{ min} &= \frac{6630}{60} \text{ hours} \\ &= 110.5 \text{ hours} \end{aligned}$$

$$\begin{aligned} & \left(\text{or } 110 \text{ hours} + 0.5 \text{ hours} \right) \\ &= 110 \text{ hours} + 0.5 \text{ minutes} \\ & \text{(as } 0.5 \text{ hours} = \text{half of an hour} = 30 \text{ min)} \end{aligned}$$

e) 345 minutes into hours

Solution:

$$\begin{aligned} &= \frac{345}{60} \text{ hrs} \\ &= 5.75 \text{ hrs} \end{aligned}$$

f) 446 seconds into minutes and seconds

Solution:

$$\begin{aligned} & 446 \text{ sec} \\ &= \frac{446}{60} \text{ min} \\ &= 7 \text{ min} + 26 \text{ sec} \end{aligned}$$

$$\begin{array}{r} 7 \leftarrow \\ 60 \overline{) 446} \\ \underline{- 420} \\ 26 \leftarrow \end{array}$$
$$\frac{346}{60} \text{ min} = 7 \text{ min} + 26 \text{ sec}$$

g) 180 months to years

Solution:

= 180 months

= $\frac{180}{12}$ years

= 15 years

$$\begin{array}{r} 15 \\ 12 \overline{) 180} \\ \underline{- 12} \\ 60 \\ \underline{- 60} \\ 0 \end{array}$$

h) 5 years to months

Solution:

= 5 years

= 5×12 months

= 60 months

i) 7 weeks to days

Solution:

= 7 weeks

= 7×7 days

= 49 days

Learning Check 5.4

1. Solve the following.

a)

h	min
12 ^①	34
+ 41	26
54	0

$$\begin{array}{r} 34 \\ + 26 \\ \hline 60 \end{array}$$

as 60 min = 1 hr

Answer: 54 h 0 min or 54 h

b)

h	min
32 ^①	24
+ 14	54
47	18

$$\begin{array}{r} 24 \\ + 54 \\ \hline 78 \end{array}$$

78 min = 60 min + 18 min
= 1 hr + 18 min
we carry 1 hr to hr column

Answer: 47 h 18 min

c)

h	min
17	32
+ 11	29
29	1

$$\begin{array}{r} 32 \\ + 29 \\ \hline 61 \end{array}$$

as 61 min + 1 min
= 1 hr + 1 min

Answer: 29 h 1 min

d)

h	min
7	22
- 6	55
0	27

Take 1 hr = 60 min
from hrs column as 22
is less than

Answer: 27 min

e)

h	min	
25 26	60 40	60
		+ 40
		<u>100</u>
- 10	59	- 59
		<u>41</u>
15	41	

Answer: 15 h 41 min

f)

h	min	
55 56	60 41	60
		+ 41
		<u>101</u>
- 44	51	- 51
		<u>50</u>
11	50	

Answer: 11 h 50 min

g)

h	min	
13 ^①	54	54
		+ 15
		<u>69</u>
+ 9	15	
23	9	

69 min = 60 + 9 min
= 1 hr + 9 min

Answer: 23 h 9 min

h)

h	min	
58 59	60 15	60
		+ 15
		<u>75</u>
- 58	48	- 48
		<u>27</u>
0	27	

Answer: 27 min

i)

h	min	
44 45	60 13	60
		+ 13
		<u>73</u>
- 21	25	- 25
		<u>48</u>
23	48	

Answer: 23 h 48 min

2. Solve these.

a) 53 h 36 min + 44 h 42 min

Solution:

①	53 h 36 min	36
		+ 42
		<u>78</u>
+ 44 h	42 min	
98 h	18 min	

18 min = 60 min + 18 min
= 1 hr + 18 min

b) 11 h 22 min + 55 h 54 min

Solution:

①	11 h 22 min	22
		+ 54
		<u>76</u>
+ 55 h	54 min	
67 h	16 min	

76 min = 60 in + 16 min
= 1 hr + 16 min

c) 85 h 31 min – 66 h 36 min

Solution:

$$\begin{array}{r} \overset{84}{\cancel{85}} \text{ h } \overset{60}{31} \text{ min} \\ - 66 \text{ h } 36 \text{ min} \\ \hline 18 \text{ h } 55 \text{ min} \end{array} \quad \begin{array}{r} 60 \\ + 31 \\ \hline 91 \\ - 36 \\ \hline 55 \end{array}$$

d) 111 h 55 min – 101 h 56 min

Solution:

$$\begin{array}{r} \overset{110}{\cancel{111}} \text{ h } \overset{60}{55} \text{ min} \\ - 101 \text{ h } 56 \text{ min} \\ \hline 9 \text{ h } 59 \text{ min} \end{array} \quad \begin{array}{r} 60 \\ + 55 \\ \hline 115 \\ - 56 \\ \hline 59 \end{array}$$

e) 65 h 14 min – 45 h 23 min

Solution:

$$\begin{array}{r} \overset{64}{\cancel{65}} \text{ h } \overset{60}{14} \text{ min} \\ - 45 \text{ h } 23 \text{ min} \\ \hline 19 \text{ h } 51 \text{ min} \end{array} \quad \begin{array}{r} 60 \\ + 14 \\ \hline 74 \\ - 23 \\ \hline 51 \end{array}$$

f) 15 h 3 min + 8 h 5 min

Solution:

$$\begin{array}{r} 15 \text{ h } 3 \text{ min} \\ + 8 \text{ h } 5 \text{ min} \\ \hline 23 \text{ h } 8 \text{ min} \end{array}$$

g) 18 h 28 min – 13 h 46 min

Solution:

$$\begin{array}{r} \overset{17}{\cancel{18}} \text{ h } \overset{60}{28} \text{ min} \\ - 13 \text{ h } 46 \text{ min} \\ \hline 4 \text{ h } 42 \text{ min} \end{array} \quad \begin{array}{r} 60 \\ + 28 \\ \hline 88 \\ - 46 \\ \hline 42 \end{array}$$

h) 67 h 26 min + 16 h 40 min

Solution:

$$\begin{array}{r} \textcircled{1} 67 \text{ h } 26 \text{ min} \\ + 16 \text{ h } 40 \text{ min} \\ \hline 84 \text{ h } 06 \text{ min} \end{array} \quad \begin{array}{r} 26 \\ + 40 \\ \hline 66 \end{array}$$

66 min = 60 min + 6 min
= 1 hr + 6 min

Learning Check 5.5

1. On a certain day, a worker worked for 8 hours 39 minutes and did overtime for 2 hours 40 minutes. Find the total time he spent at work.

Solution:

$$\begin{array}{rcl} \text{Worker worked for} & = & \textcircled{1} 8 \text{ h } 39 \text{ min} \\ \text{he did overtime for} & = & + 2 \text{ h } 40 \text{ min} \\ \hline \text{Total time spent} & = & 11 \text{ h } 19 \text{ min} \end{array}$$

$$\begin{array}{r} 39 \\ + 40 \\ \hline 79 \end{array}$$

79 min = 60 min + 19 min
= 1 hr + 19 min

So the worker spent 11 h 19 min at work.

- 2. Maryam spent 2 hours 55 minutes practising grammar and 3 hours 17 minutes practising Mathematics. Find the total time she spent doing both activities. Convert the answer to hours.**

Solution:

$$\begin{array}{rcl}
 \text{Maryam spent to practice grammar} & = & \textcircled{1} \quad 2 \text{ h } 55 \text{ min} \\
 \text{She spent to practice Mathematics} & = & + 3 \text{ h } 17 \text{ min} \\
 \hline
 \text{Total time spent} & = & 6 \text{ h } 12 \text{ min}
 \end{array}
 \quad
 \begin{array}{r}
 65 \\
 + 17 \\
 \hline
 82
 \end{array}
 \quad
 \begin{array}{l}
 72 \text{ min} = 60 \text{ min} + 12 \text{ min} \\
 = 1 \text{ hr} + 12 \text{ min}
 \end{array}$$

In hours:

$$\begin{aligned}
 &= 6 \text{ h} + 12 \text{ min} \\
 &= + 6 \text{ h} + \frac{12}{60} \text{ min} \\
 &= 6 \text{ h} + 0.2 \text{ min} \\
 &= 6.2 \text{ h}
 \end{aligned}$$

So Maryam spent 6 h 12 min or 6.2 h in doing both activities.

- 3. Adnan travelled for 5 hours 35 minutes on Monday and 2 hours and 15 minutes on Tuesday. Find the total time he spent travelling altogether. Express the answer in minutes.**

Solution:

$$\begin{array}{rcl}
 \text{Adnan travelled on Monday} & = & 5 \text{ h } 35 \text{ min} \\
 \text{Adnan travelled on Tuesday} & = & + 2 \text{ h } 15 \text{ min} \\
 \hline
 \text{Total time spent} & = & 7 \text{ h } 50 \text{ min}
 \end{array}
 \quad
 \begin{array}{r}
 35 \\
 + 15 \\
 \hline
 50
 \end{array}$$

In hours:

$$\begin{aligned}
 &7 \text{ h } 50 \text{ min} \\
 &= 7 \times 60 \text{ min} + 50 \text{ min} \\
 &= 420 \text{ min} + 50 \text{ min} \\
 &= 470 \text{ min}
 \end{aligned}$$

So Adnan spent 7 h 50 min or 470 min travelled altogether.

4. Ali spent 4 months 4 weeks in one city and 3 months 2 weeks in another city on account of his office work. Find the difference between the time he spent in both cities.

Solution:

Ali spent in one city = 4 months 4 weeks

Ali spent in another city = -3 months 2 weeks

Difference in time spent in both city = 1 month 2 weeks

So there is difference of 1 month 2 weeks between the time he spent in both cities.

5. A bus takes 6 hours 13 minutes to reach from one city to another and a train takes 9 hours 27 minutes to cover the same distance. How much more time does the train take than the bus? Also convert the answer to minutes.

Solution:

Train takes to reach from one city to another = 9 h 27 min

Bus takes to reach from one city to another = - 6 h 13 min

Difference between the time taken by both in minutes = 3 h 14 min

In minutes:

$$\begin{aligned} & 3 \text{ h } 14 \text{ min} \\ &= 3 \times 60 \text{ min} + 14 \text{ min} \\ &= 180 \text{ min} + 14 \text{ min} \\ &= 194 \text{ min} \end{aligned}$$

So the train takes 3h 14 min or 194 min more than the bus to cover the same distance.

Unit Check 5

1. Encircle the correct options.

a) (i) 185

b) (ii) 42

c) (ii) 539

d) (iii) 8 h 12 min

e) (i) 45023

2. Convert the following.

a) 23.1 cm into mm

Solution:

23.1 cm

$$= 23.1 \times 10 \text{ mm}$$

$$= 231 \text{ mm}$$

b) 14 m into km

Solution:

14 m

$$= \frac{14}{1000} \text{ km}$$

$$= 0.014 \text{ km}$$

c) 44 cm into m

Solution:

44 cm

$$= \frac{44}{100} \text{ m}$$

$$= 0.44 \text{ m}$$

d) 23 m 12 cm into cm

Solution:

23 m 12 cm

$$= 23 \times 100 \text{ cm} + 12 \text{ cm}$$

$$= 2300 \text{ cm} + 12 \text{ cm}$$

$$= 2312 \text{ cm}$$

e) 34.5 km into m

Solution:

34.5 km

$$= 34.5 \text{ km} \times 1000 \text{ m}$$

$$= 34500 \text{ m}$$

f) 45 h into min

Solution:

45 h

$$= 45 \times 60 \text{ min}$$

$$= 2700 \text{ min}$$

g) 56 min 34 sec into sec

Solution:

56 min 34 sec

$$= 56 \times 60 \text{ sec} + 34 \text{ sec}$$

$$= 3360 \text{ sec} + 34 \text{ sec}$$

$$= 3394 \text{ sec}$$

h) 84 years into months

Solution:

84 years

$$= 84 \times 12 \text{ months}$$

$$= 1008 \text{ months}$$

i) 56 months 22 days into days

Solution:

56 months 22 days

$$= 56 \times 30 \text{ days} + 22 \text{ days}$$

$$= 1680 \text{ days} + 22 \text{ days}$$

$$= 1702 \text{ days}$$

3. Solve the following.

a) Add 234 km 123 m into 127 km 100m

$$\begin{array}{r} 234 \text{ km} \quad 123 \text{ m} \\ + 127 \text{ km} \quad 100 \text{ m} \\ \hline 361 \text{ km} \quad 223 \text{ m} \end{array}$$

b) Add 567 km 144 m into 332 km 231 m

$$\begin{array}{r} 567 \text{ km} \quad 144 \text{ m} \\ + 332 \text{ km} \quad 231 \text{ m} \\ \hline 899 \text{ km} \quad 375 \text{ m} \end{array}$$

c) Subtract 456 km 111 m from 667 km 266 m

$$\begin{array}{r} 667 \text{ km} \quad 266 \text{ m} \\ - 456 \text{ km} \quad 111 \text{ m} \\ \hline 211 \text{ km} \quad 155 \text{ m} \end{array}$$

d) 44 h 42 min + 55 h 27 min

$$\begin{array}{r} \textcircled{1} \\ 44 \text{ h} \quad 42 \text{ min} \\ + 55 \text{ h} \quad 27 \text{ min} \\ \hline 100 \text{ h} \quad 9 \text{ min} \end{array}$$

$$\begin{array}{r} 42 \\ + 27 \\ \hline 69 \\ 69 \text{ min} = 60 \text{ min} + 9 \text{ min} \\ = 1 \text{ h} + 9 \text{ min} \end{array}$$

e) 22 h 33 min + 66 h 34 min

$$\begin{array}{r} \textcircled{1} \\ 22 \text{ h} \quad 33 \text{ min} \\ + 66 \text{ h} \quad 34 \text{ min} \\ \hline 89 \text{ h} \quad 7 \text{ min} \end{array}$$

$$\begin{array}{r} 33 \\ + 34 \\ \hline 67 \\ 67 \text{ min} = 60 \text{ min} + 7 \text{ min} \\ = 1 \text{ h} + 7 \text{ min} \end{array}$$

f) 86 h 12 min – 58 h 47 min

$$\begin{array}{r} ^{85} \cancel{86} \text{ h} \quad ^{60} 12 \text{ min} \\ - 58 \text{ h} \quad 47 \text{ min} \\ \hline 57 \text{ h} \quad 25 \text{ min} \end{array}$$

$$\begin{array}{r} 60 \\ + 12 \\ \hline 72 \\ - 47 \\ \hline 25 \end{array}$$

g) 222 h 26 min – 212 h 46 min

$$\begin{array}{r} 222 \text{ h} \quad 26 \text{ min} \\ - 212 \text{ h} \quad 40 \text{ min} \\ \hline 009 \text{ h} \quad 40 \text{ min} \end{array}$$

$$\begin{array}{r} 60 \\ + 26 \\ \hline 86 \\ - 46 \\ \hline 40 \end{array}$$

or 9 h 40 min

4. **Amna spent 1 hour 15 minutes baking a cake and 2 hours 50 minutes cooking food. Find the total time she spent doing both activities.**

Solution:

$$\text{Amna spent in baking cake} = \overset{\textcircled{1}}{1 \text{ h } 15 \text{ min}}$$

$$\text{Amna spent in cooking food} = + 2 \text{ h } 50 \text{ min}$$

$$\text{Total time spent} = \underline{4 \text{ h } 5 \text{ min}}$$

$$\begin{array}{r} 35 \\ + 50 \\ \hline 65 \end{array}$$

65 min = 60 min + 5 min
= 1 h + 5 min

So Adnan spent 4 h 5 min in both activities.

5. **A painter took 2 hours 55 minutes painting a door and 3 hours 18 minutes painting a wall. Find the total time he spent painting both.**

Solution:

$$\text{Painter took in painting a door} = \overset{\textcircled{1}}{2 \text{ h } 55 \text{ min}}$$

$$\text{Painter took in painting a wall} = + 3 \text{ h } 18 \text{ min}$$

$$\text{Total time spent spent in painting both} = \underline{6 \text{ h } 13 \text{ min}}$$

$$\begin{array}{r} 55 \\ + 18 \\ \hline 73 \end{array}$$

So Adnan spent 4 h 5 min in both activities.

$$73 \text{ min} = 60 \text{ min} + 13 \text{ min} \\ = 1 \text{ h} + 13 \text{ min}$$

6. **A group of workers took 84 weeks and 6 days to construct a shop and 32 weeks 3 days to construct a room. How much time did they spend altogether constructing the shop and the room? Convert the answer into days.**

Solution:

$$\text{Workers took to construct a shop} = \overset{\textcircled{1}}{84 \text{ weeks } 6 \text{ days}}$$

$$\text{Workers took to construct a room} = + 32 \text{ weeks } 3 \text{ days}$$

$$\text{Weeks and days spent altogether} = 117 \text{ weeks } 2 \text{ days}$$

In hours:

$$\begin{aligned} & 117 \text{ weeks } 2 \text{ days} \\ = & 117 \times 7 \text{ days} + 2 \text{ days} \\ = & 819 + 2 \text{ days} \\ = & 821 \text{ days} \end{aligned}$$

$$\begin{array}{r} 6 \\ + 3 \\ \hline 9 \text{ days} \end{array}$$

9 days = 7 days + 2 days
9 days = 1 week + 2 days
We carry this 1 week to the weeks column, so only 2 days are left in days column

So the workers spent altogether.

117 weeks 2 days or 821 days in constructing a shop and a room.

7. A piece of pipe is 86 m 23 cm long. 55 m 44 cm of the pipe has been used. How much pipe is left? Write the answer in cm.

Solution:

$$\text{Length of pipe piece} = \overset{85}{\cancel{86}} \text{ m } \overset{100}{23} \text{ cm}$$

$$\text{Length of pipe used} = - 55 \text{ m } 44 \text{ cm}$$

$$\text{Length of pipe left} = \underline{\hspace{1cm}} 6 \text{ m } 79 \text{ cm}$$

In cm:

$$\begin{aligned} & 30 \text{ m } 79 \text{ cm} \\ &= 30 \times 100 \text{ cm} + 79 \text{ cm} \\ &= 3000 \text{ cm} + 79 \text{ cm} \\ &= 3079 \text{ cm} \end{aligned}$$

We carry 1 m = 100 cm
from 'm' column

$$\begin{array}{r} 100 \\ + 23 \\ \hline 123 \\ - 44 \\ \hline 79 \end{array}$$

So 30 m 79 cm or 3079 cm length of pipe is left.

8. Park A has a walking track that is 7 km 745 m long. Park B has a walking track that is 11 km 456 m long. What is the difference between the length of the two tracks? Express the answer in kilometers.

Solution:

$$\text{Length of track in Park B} = \overset{10}{\cancel{11}} \text{ km } \overset{1000}{456} \text{ m}$$

$$\text{Length of track in Park A} = - 7 \text{ km } 745 \text{ m}$$

$$\text{Difference between length of both tracks} = \underline{\hspace{1cm}} 3 \text{ km } 711 \text{ m}$$

In km:

$$\begin{aligned} & 3 \text{ km } 711 \text{ m} \\ &= 3 \text{ km} \times \frac{711}{1000} \text{ km} \\ &= 3 \text{ km} + 0.711 \text{ km} \\ &= 3.711 \text{ km} \end{aligned}$$

Unit 6: Unitary Method

Learning Check 6.1

Value of many items	=	Value of one item	×	Number of one items
------------------------	---	----------------------	---	------------------------

- 1. The cost of one toy car is Rs 120. What is the cost of 5 such toy cars?**

Solution:

$$\text{Cost of one toy car} = \text{Rs } 120$$

$$\text{Number of toy cars} = 5$$

$$\begin{aligned}\text{Cost of 5 toy cars} &= \text{Cost of one toy car} \times \text{Number of toy cars} \\ &= 120 \times 5 \\ &= \text{Rs. } 600\end{aligned}$$

So, cost of 5 toy cars is Rs. 600

- 2. If the price of one handbag is Rs 1900, what is the price of 3 such handbags?**

Solution:

$$\text{Cost of one handbag} = \text{Rs } 1900$$

$$\text{Number of handbags} = 3$$

$$\begin{aligned}\text{Cost of 3 handbags} &= \text{Rs. } 1900 \times 3 \\ &= \text{Rs. } 5700\end{aligned}$$

So, cost of 3 handbags is Rs. 5700

- 3. The cost of one blender is Rs 3500. What is the price of 9 such blenders?**

Solution:

$$\text{Price of one blender} = \text{Rs } 3500$$

$$\text{Number of blenders} = 9$$

$$\begin{aligned}\text{Price of 9 blenders} &= \text{Rs. } 3500 \times 9 \\ &= \text{Rs. } 31,500\end{aligned}$$

So, price of 9 blenders is Rs. 31,500

4. The cost of one pack of dates is Rs 540.

Find:

Solution:

a) Cost of one pack of dates = Rs 540

Number of packs of dates = 2

$$\begin{aligned}\text{Cost of 2 packs of dates} &= \text{Rs. } 540 \times 2 \\ &= \text{Rs. } 1080\end{aligned}$$

So, the cost of 2 packs of dates is Rs. 1080

b) Cost of one pack of dates = Rs 540

Number of packs of dates = 18

$$\begin{aligned}\text{Cost of 18 packs of dates} &= \text{Rs. } 540 \times 18 \\ &= \text{Rs. } 9720\end{aligned}$$

So, the cost of 18 packs of dates is Rs. 9720

5. The mass of one sack of rice is 5 kg,

Find:

Solution:

a) Mass of one sack of rice = 5 kg

Number of sacks = 15

$$\begin{aligned}\text{Mass of 15 sacks of rice} &= 5 \text{ kg} \times 15 \\ &= 75 \text{ kg}\end{aligned}$$

So, mass of 15 sacks of rice is 75 kg.

b) Mass of one sack of rice = 5 kg

Number of sacks = 22

$$\begin{aligned}\text{Mass of 22 sacks of rice} &= 5 \text{ kg} \times 22 \\ &= 110 \text{ kg}\end{aligned}$$

So, mass of 22 sacks of rice is 110 kg.

$$\begin{aligned}
 \text{c) Mass of one sack of rice} &= 5 \text{ kg} \\
 \text{Number of sacks} &= 45 \\
 \text{Mass of 45 sacks of rice} &= 45 \text{ kg} \times 5 \text{ kg} \\
 &= 225 \text{ kg}
 \end{aligned}$$

So, mass of 45 sacks of rice is 225 kg.

Learning Check 6.2

Value of many items	=	Value of one item	÷	Number of one items
------------------------	---	----------------------	---	------------------------

1. Saba bought 12 spoons for Rs 840. What is the cost of one spoon?

Solution:

$$\text{Number of spoons} = 12$$

$$\text{Price of 12 spoons} = \text{Rs. } 840$$

$$\begin{aligned}
 \text{Price of one spoon} &= \text{Rs. } 840 \div 12 \\
 &= \text{Rs. } 70
 \end{aligned}$$

$$\begin{array}{r}
 70 \\
 \hline
 12 \overline{) 840} \\
 \underline{- 84} \downarrow \\
 00
 \end{array}$$

So, the price of one spoon is Rs. 70.

2. Hadi bought 4 video games for Rs 8400. What is the price of one video game?

Solution:

$$\text{Number of video games} = 4$$

$$\text{Price of 4 video games} = \text{Rs. } 8400$$

$$\begin{aligned}
 \text{Price of one video game} &= \text{Rs. } 8400 \div 4 \\
 &= \text{Rs. } 2100
 \end{aligned}$$

$$\begin{array}{r}
 2100 \\
 \hline
 4 \overline{) 8400} \\
 \underline{- 8} \downarrow \downarrow \downarrow \\
 4 \downarrow \downarrow \downarrow \\
 \underline{- 4} \downarrow \downarrow \downarrow \\
 000
 \end{array}$$

So, the price of one video game is Rs. 2100.

3. The price of 6 chairs is Rs 6720. What is the price of 1 chair?

Solution:

$$\text{Number of chairs} = 6$$

$$\text{Price of 6 chairs} = \text{Rs. } 6720$$

$$\begin{aligned}
 \text{Price of one chair} &= \text{Rs. } 6720 \div 6 \\
 &= \text{Rs. } 1120
 \end{aligned}$$

So, the price of one chair is Rs. 1120.

$$\begin{array}{r}
 1120 \\
 \hline
 6 \overline{) 6720} \\
 \underline{- 6} \downarrow \downarrow \downarrow \\
 07 \downarrow \downarrow \downarrow \\
 \underline{- 6} \downarrow \downarrow \downarrow \\
 12 \downarrow \downarrow \downarrow \\
 \underline{- 12} \\
 00
 \end{array}$$

4. The cost of 13 kg of rice is Rs 2574. What is the cost of 1 kg of rice?

Solution:

Mass of rice = 13 kg

Price of 13 kg rice = Rs. 2574

Price of 1 kg rice = Rs. $2574 \div 13$
= Rs. 198

So, the price of 1 kg rice is Rs. 198.

$$\begin{array}{r} 198 \\ 13 \overline{) 2574} \\ \underline{- 13} \downarrow \\ 127 \\ \underline{- 117} \downarrow \\ 104 \\ \underline{- 104} \\ 0 \end{array}$$

5. The price of 8 tissue boxes is Rs 840. What is the price of one tissue box?

Solution:

Number of tissue boxes = 8

Price of 8 tissue boxes = Rs. 840

Price of 1 tissue box = Rs. $840 \div 8$
= Rs. 105

So, the price 1 tissue boxes is Rs. 105.

$$\begin{array}{r} 105 \\ 8 \overline{) 840} \\ \underline{- 8} \downarrow \downarrow \\ 040 \\ \underline{- 40} \\ 0 \end{array}$$

Learning Check 6.3

To find value of more than 1 object when price of some items is given, first find value of 1 item, then multiply that value by the number of items given.

1. The cost of 7 liters of petrol is Rs 749. How much will 12 liters of petrol cost?

Solution:

Volume of petrol = 7 litres

Cost of 7 litres petrol = Rs. 749

Cost of 1 litre petrol = Rs. $749 \div 7$
= Rs. 107

Cost of 12 litres petrol = Rs. 107×12
= Rs. 1284

So, cost of 12 litres petrol is Rs. 1284.

$$\begin{array}{r} 107 \\ 12 \overline{) 749} \\ \underline{- 7} \downarrow \downarrow \\ 49 \\ \underline{- 49} \\ 0 \end{array}$$

$$\begin{array}{r} 107 \\ \times 12 \\ \hline 214 \\ \times 1070 \\ \hline 1284 \end{array}$$

- 2. The length of 5 pieces of wire is 60 meters. Find the length of 23 such pieces of wire.**

Solution:

Number of pieces of wire = 5

Length of 5 pieces of wire = 60 m

Length of 1 piece of wire = $60 \text{ m} \div 5$
= 12 m

Length of 23 piece of wire = $12 \times 23 \text{ m}$
= 276 m

$$\begin{array}{r} 23 \\ \times 12 \\ \hline 46 \\ 30 \\ \hline 276 \end{array}$$

So, the length of 23 pieces of wire is 276 metres.

- 3. The mass of 12 bags of flour is 96 kg. What will be the mass of 4 such bags of flour?**

Solution:

Number of bags of flour = 12

Mass of 12 bags of wire = 96 kg

Mass of 1 bags of flour = $96 \div 12$
= 8 kg

Mass of 4 bags of flour = $8 \text{ kg} \times 4$
= 32 kg

$$\begin{array}{r} 8 \\ 12 \overline{) 96} \\ \underline{- 96} \\ 0 \end{array}$$

So, the mass of 4 bags of flour is 32 kg.

- 4. The monthly salary of Kamal is Rs 40,650. What is his salary for 12 days?**

Solution:

Number of days = (1 month) 30 days

Salary for 30 days = Rs. 40,650

Salary for 1 day = $\text{Rs. } 40650 \div 30$
= Rs. 1355

Salary for 12 day = $\text{Rs. } 1355 \times 12$
= Rs. 16260

$$\begin{array}{r} 1365 \\ 30 \overline{) 40650} \\ \underline{- 30} \downarrow \\ 106 \downarrow \\ \underline{- 90} \downarrow \\ 165 \downarrow \\ \underline{- 150} \downarrow \\ 150 \end{array}$$

$$\begin{array}{r} 1355 \\ \times 12 \\ \hline 2710 \\ + 13550 \\ \hline 16260 \end{array}$$

So, the salary of Kamal for 12 days will be Rs. 16260.

5. The price of 16 m of fabric is Rs 13,600. What will be the price of:

Solution:

Length of the fabric = 16 m

Price of 16 m fabric = Rs. 13,600

Price of 1 m fabric = Rs. $13600 \div 16$
= Rs. 850

$$\begin{array}{r} 850 \\ 16 \overline{) 13600} \\ \underline{-128} \\ 80 \\ \underline{-80} \\ 00 \end{array}$$

a) Price of 1 m fabric = Rs. 850

Price of 11 m fabric = Rs. 850×11
= Rs. 9350

$$\begin{array}{r} 850 \\ \times 11 \\ \hline \textcircled{8}50 \\ + 8500 \\ \hline 9350 \end{array}$$

So, the price of 11 m fabric is Rs. 9350

b) Price of 1 m fabric = Rs. 850

Price of 25 m fabric = Rs. 850×25
= Rs. 21,250

So, the price of 25 m fabric is Rs. 21250

6. Three buses of the same capacity can carry 225 passengers. Find:

Solution:

Number of buses

= 3

Number of a passengers carried by 3 buses

= 225

Number of a passengers carried by 1 bus

= $225 \div 3$

= 75

$$\begin{array}{r} 75 \\ 3 \overline{) 225} \\ \underline{-21} \\ 15 \\ \underline{-15} \\ 0 \end{array}$$

a) Number of a passengers carried by 1 bus = 75

Number of a passengers carried by 8 buses = 75×8

= 600

$$\begin{array}{r} 850 \\ \times 8 \\ \hline 600 \end{array}$$

So, 600 passengers can be carried by 8 buses

b) Number of a passengers carried by 1 bus = 75

Number of a passengers carried by 19 buses = 75×19

= 1425

$$\begin{array}{r} 75 \\ \times 19 \\ \hline 675 \\ + 750 \\ \hline 1425 \end{array}$$

So, 1425 passengers can be carried by 19 buses

7. The price of 6 bottles of lotion is Rs 1020. What is the cost of:

Solution:

Number of bottles of lotion = 6
 Price of 6 bottles of lotion = Rs. 1020
 Price of 1 bottle of lotion = Rs. $1020 \div 6$
 = Rs. 170

$$\begin{array}{r} 170 \\ 6 \overline{) 1020} \\ \underline{- 6} \downarrow \\ 42 \\ \underline{- 42} \downarrow \\ 00 \end{array}$$

a) Price of 1 bottle of lotion = Rs. 170
 Price of 5 bottles of lotion = Rs. 170×5
 = Rs. 850

$$\begin{array}{r} 170 \\ \times 5 \\ \hline 850 \end{array}$$

So, the price of 5 bottles of lotion is Rs. 850

b) Price of 1 bottle of lotion = Rs. 170
 Price of 16 bottles of lotion = Rs. 170×16
 = Rs. 2720

$$\begin{array}{r} 170 \\ \times 16 \\ \hline 1020 \\ + 1700 \\ \hline 2720 \end{array}$$

So, the price of 16 bottles of lotion is Rs. 2720.

8. The price of 12 footballs is Rs 1608. What is the price of:

Solution:

Number of footballs = 12
 Price of 12 footballs = Rs. 1608
 Price of 1 football = Rs. $1608 \div 12$
 = Rs. 134

$$\begin{array}{r} 134 \\ 12 \overline{) 1608} \\ \underline{- 12} \downarrow \\ 40 \\ \underline{- 36} \downarrow \\ 48 \\ \underline{- 48} \\ 0 \end{array}$$

a) Price of 1 football = Rs. 134
 Price of 9 footballs = Rs. 134×9
 = Rs. 1206

$$\begin{array}{r} 134 \\ \times 9 \\ \hline 1206 \\ 2080 \end{array}$$

So, the price of 9 footballs is Rs. 1206

b) Price of 1 footballs = Rs. 134
 Price of 20 footballs = Rs. 134×20
 = Rs. 2680

$$\begin{array}{r} 134 \\ \times 20 \\ \hline 000 \\ + 2680 \\ \hline 2680 \end{array}$$

So, the price of 20 footballs is Rs. 2680.

Unit Check 6

1. Encircle the correct options.

- a) (iii) 1
- b) (ii) Value of multiple items $\times$ Number of many items
- c) (i) Rs 1950
- d) (iv) Value of many items $\div$ Number of items
- e) (i) Rs 6370

2. If the price of a storybook is Rs 350, find the price of 8 such storybooks.

Solution:

Number of story books = 8

Price of 1 story book = Rs. 350

Price of 8 story books = Rs. 350×8

= Rs. 2800

$$\begin{array}{r} 350 \\ \times 8 \\ \hline 2800 \end{array}$$

So, the price of 8 story books is Rs. 2800.

3. The price of 6 shirts is Rs 4800. What is the price of one shirt?

Solution:

Number of shirts = 6

Price of shirts = Rs. 4800

Price of 1 shirt = Rs. $4800 \div 6$

= Rs. 800

$$\begin{array}{r} 800 \\ 6 \overline{) 4800} \\ \underline{- 48} \downarrow \downarrow \\ 000 \end{array}$$

So, the price of 1 shirt is Rs. 800.

4. If the total length of 12 identical logs is 60 m, find the total length of 32 such logs.

Solution:

Number of logs = 12

Length 12 logs = 60 m

Length 1 log = 60 m $\div$ 12

= 5 m

Length of 32 such identical log is = 5 m $\times$ 32

= 160 m

So, the length of 32 such identical log is 160 m.

$$\begin{array}{r} 5 \\ 12 \overline{) 60} \\ \underline{- 60} \\ 0 \end{array}$$

$$\begin{array}{r} 160 \\ \times 5 \\ \hline 800 \end{array}$$

Unit 7: Geometry

Learning Check 7.1

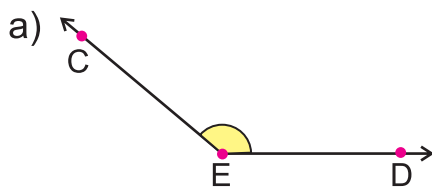
1. Sort these angles in the given table.

Solution:

Acute angle	Obtuse angle	Reflex angle	Right angle	Straight angle
An angle whose value is less 90° , 70° , 25°	An angle greater than 90° but less than 180° , 170° , 175° , 135° , 121°	An angle greater than 180° and less than 360° , 217° , 302° , 250° , 295°	An angle equal to 90° exactly 90°	An angle exactly equal to 180° 180°

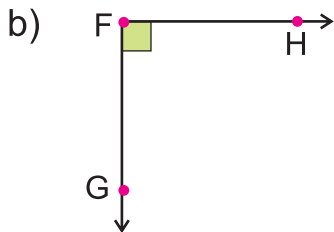
2. Compare and name the types of the following angles by using a cardboard model of a right angle.

Solution:



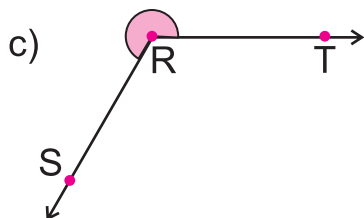
As this angle is greater than 90° but less than 180° , so it is an obtuse angle.

$\angle CED$ is an obtuse angle.



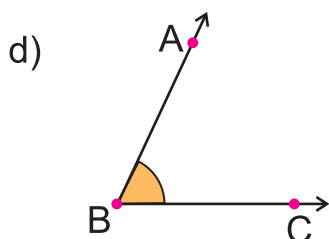
As this angle is greater than 90° so it is a right angle.

$\angle GFH$ is a right angle.



As this angle is greater than 180° but less than 360° , so it is a reflex angle.

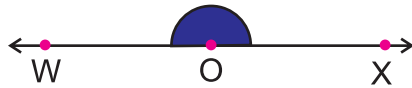
$\angle SRT$ is a reflex angle.



As this angle is less than 90° so it is an acute angle.

$\angle ABC$ is an acute angle.

e)



As this angle measures exactly equal to 180° so it is a straight angle.

$\angle WOX$ is an straight angle.

3. Construct the given angles of the following measures by using a protractor.

Solution:

(a) 90°

Suppose the names of the angle is $\angle ABC$.

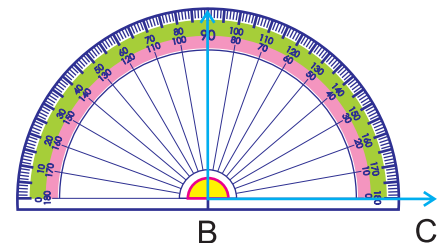
So $\angle ABC = 90^\circ$

Steps of construction:

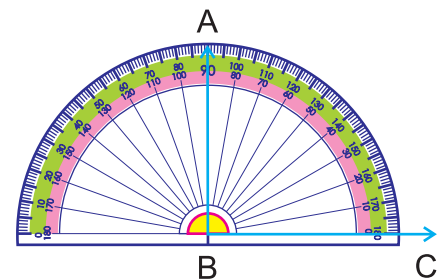
Step I: Draw a ray $\overrightarrow{BC}$ using a ruler.



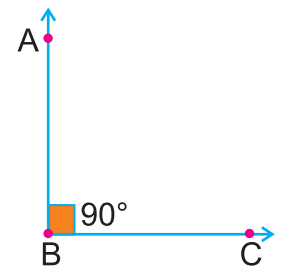
Step II: Using the protractor on $\overrightarrow{BC}$ such that the center point of the protector is exactly at point B and the baseline of the protector is aligned with $\overrightarrow{BC}$.



Step III: Read the scale on the protector and mark a point A at 90° .



Step IV: Remove the protector and join A to B. $m\angle ABC = 90^\circ$ is the required right angle.



(b) 180°

Solution:

Suppose the name of the angle is $\angle XYZ$.

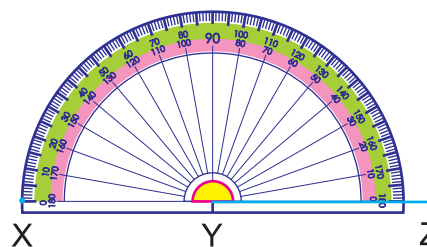
So $\angle XYZ = 180^\circ$

Steps of construction:

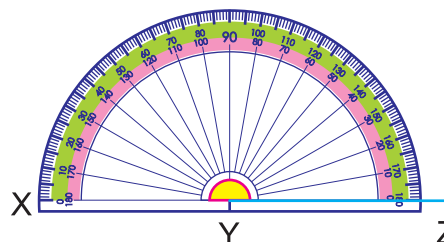
Step I: Draw a ray $\overrightarrow{YZ}$ using a ruler.



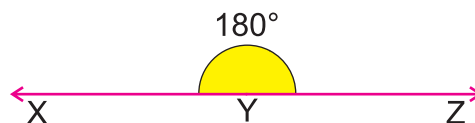
Step II: Using the protractor on $\overrightarrow{YZ}$ such that the center point of the protector is exactly at point Y and the baseline of the protector is aligned with $\overrightarrow{YZ}$.



Step III: Read the scale on the protector and mark a point X at 180° .



Step IV: Remove the protector and join X to Y. $m\angle XYZ = 180^\circ$ is the required angle.



(C) 195°

Solution:

Suppose the name of this angle is $\angle JKL$.

So $\angle JKL = 195^\circ$

195° is a reflex angle. To construct a reflex angle we subtract its value from 360° and then draw the resulting angle. The angle formed around the center point except this resulting angle. The angle formed around the center point except this resulting angle is the required angle. First we subtract 195° from 360°

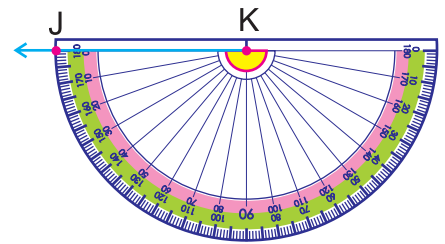
$360^\circ - 195^\circ = 165^\circ$ so we will draw an angle of 165° first

Steps of construction:

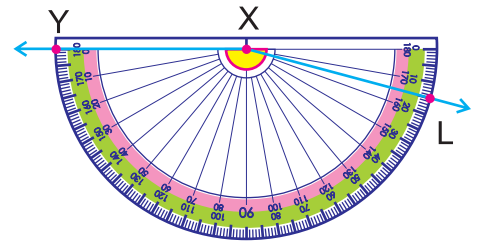
Step I: Draw a ray $\overrightarrow{KJ}$ using a ruler.



Step II: Place the protector upside down on $\overrightarrow{KJ}$ so that the center point of the protector is exactly on point K and the baseline of the protector is aligned with $\overrightarrow{JK}$.

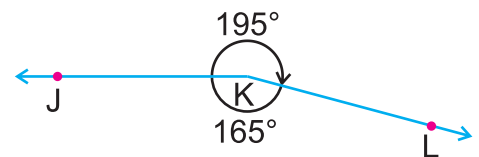


Step III: Read the scale on the protector and mark a point L at 165° .



Step IV: Remove the protector and join K to L.

$\angle JKL = 195^\circ$ is the required angle.



(C) 205°

Solution:

Suppose the name of this angle is $\angle LMN$.

So $\angle LMN = 205^\circ$

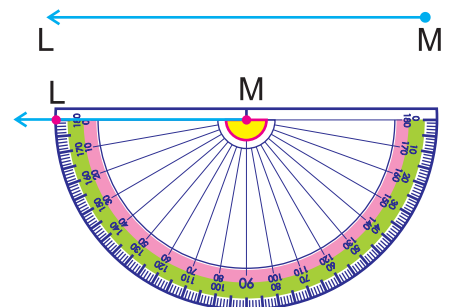
205° is a reflex angle. To construct a reflex angle, we subtract its value from 360° and then draw the resulting angle.

$$360^\circ - 205^\circ = 155^\circ$$

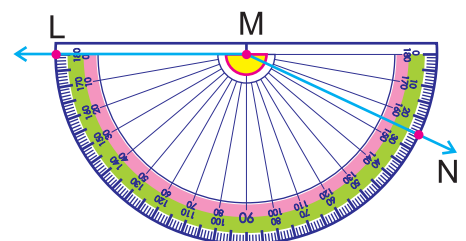
Steps of construction:

Step I: Draw a ray $\overrightarrow{ML}$ using a ruler.

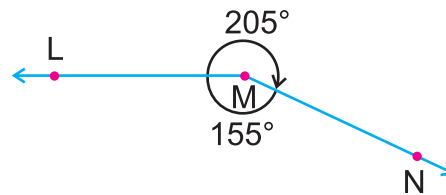
Step II: Place the protector upside down on $\overrightarrow{ML}$ so that the center point of the protector is exactly on point M and the baseline of the protector is aligned with $\overrightarrow{ML}$.



Step III: Read the scale on the protector and mark a point N at 155° .



Step IV: Remove the protector and join M to N.
 $\angle LMN = 205^\circ$ is the required angle.



(e) 230°

Solution:

Suppose the name of this angle is $\angle PQR$.

So $\angle PQR = 230^\circ$

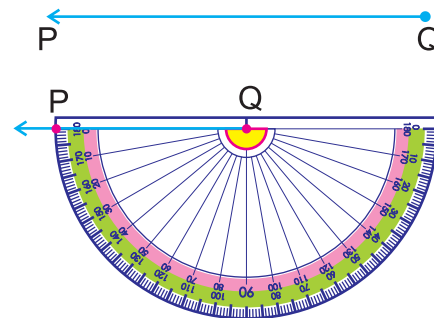
230° is a reflex angle. To construct a reflex angle, we subtract its value from 360° and then draw the resulting angle.

$$360^\circ - 230^\circ = 130^\circ$$

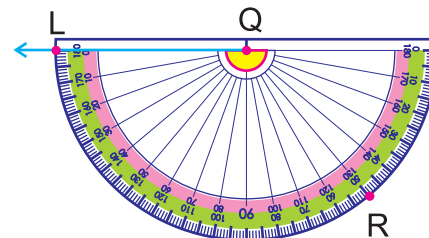
Steps of construction:

Step I: Draw a ray $\overrightarrow{QP}$ using a ruler.

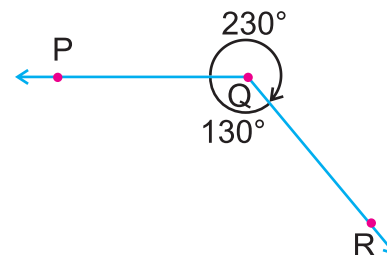
Step II: Place the protector upside down on $\overrightarrow{QP}$ so that the center point of the protector is exactly on point Q and the baseline of the protector is aligned with $\overrightarrow{QP}$.



Step III: Read the scale on the protector and mark a point R at 130° .



Step IV: Remove the protector and join Q to R.
 $\angle PQR = 230^\circ$ is the required angle.



(e) 280°

Solution:

Suppose the name of this angle is $\angle DEF$.

So $\angle DEF = 280^\circ$

280° is a reflex angle. To construct a reflex angle, we subtract its value

from 360° and then draw the resulting angle.

$$360^\circ - 280^\circ = 80^\circ$$

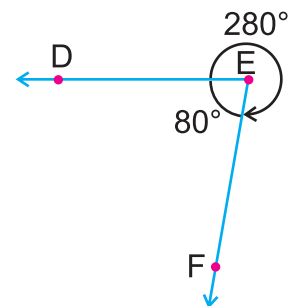
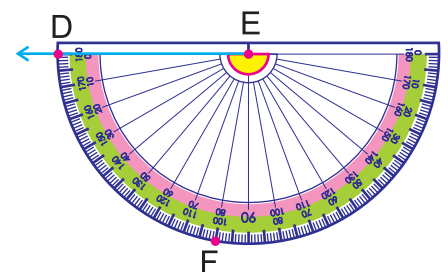
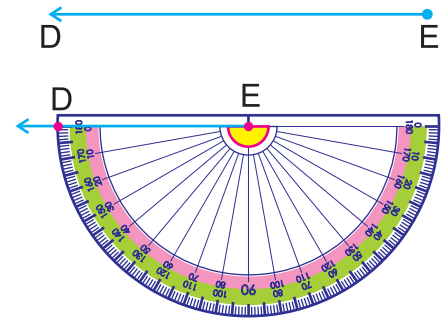
Steps of construction:

Step I: Draw a ray $\overrightarrow{ED}$ using a ruler.

Step II: Place the protector upside down on $\overrightarrow{ED}$ so that the center point of the protector is exactly on point E and the baseline of the protector is aligned with $\overrightarrow{ED}$.

Step III: Read the scale on the protector and mark a point F at 80° .

Step IV: Remove the protector and join E to F.
 $\angle DEF = 280^\circ$ is the required angle.



(e) 300°

Solution:

Suppose the name of this angle is $\angle RST$.

So $\angle RST = 300^\circ$

300° is a reflex angle. To construct a reflex angle, we subtract its value from 360° and then draw the resulting angle.

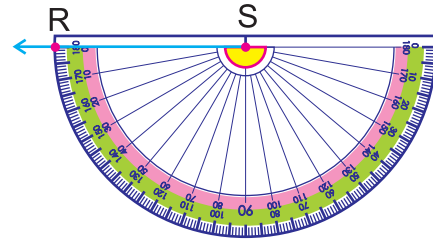
$$360^\circ - 300^\circ = 60^\circ$$

Steps of construction:

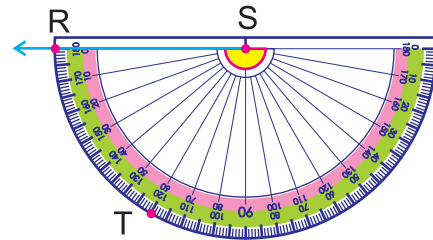
Step I: Draw a ray $\overrightarrow{SR}$ using a ruler.



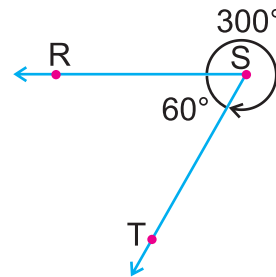
Step II: Place the protector upside down on $\overrightarrow{SR}$ so that the center point of the protector is exactly on point S and the baseline of the protector is aligned with $\overrightarrow{SR}$.



Step III: Read the scale on the protector and mark a point T at 60° .



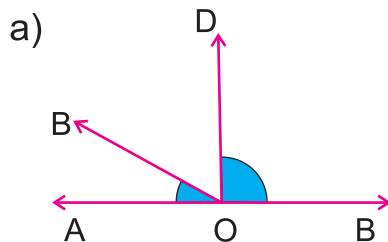
Step IV: Remove the protector and join S to T.
 $\angle RST = 300^\circ$ is the required angle.



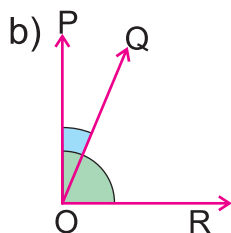
Learning Check 7.2

1. Identify the pairs of angles which are adjacent.

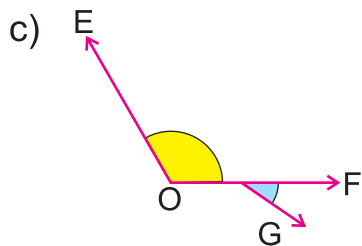
Solution:



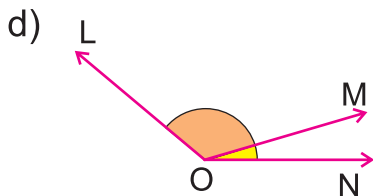
Answer: $\angle AOB$ and $\angle DOB$ have common vertex but have no common arm. So they are not adjacent.



Answer: $\angle POQ$ and $\angle POR$ are not adjacent angles as the $\angle POR$ overlap $\angle POQ$. Although they have a common arm $\overrightarrow{PO}$ and common vertex O.

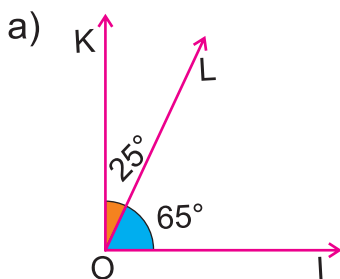


Answer: $\angle EOF$ and $\angle FOG$ are not adjacent angles as both have no common vertex, although they share a common arm $\overrightarrow{OF}$.



Answer: $\angle LOM$ and $\angle MON$ are adjacent angles as they have common vertex O, and common arm $\overrightarrow{OM}$.

2. Identify and tick (✓) the pairs of complementary angles.

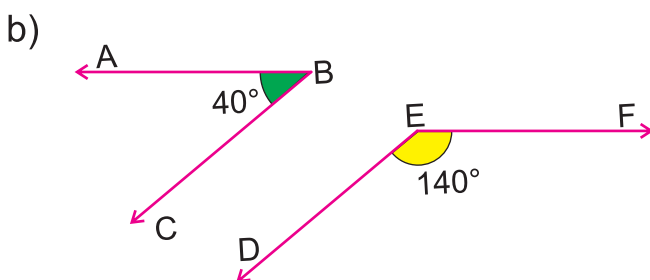


Answer: For two angles to be complementary, their sum should be equal to 90° . So, we add them: $\angle KOL + \angle LOI$.

$$= 25^\circ + 65^\circ$$

$$= 90^\circ$$

Hence they are complementary angles. (✓)



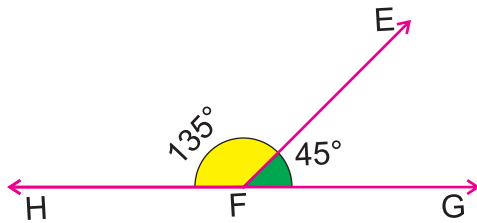
Answer: For two angles to be complementary, their sum should be equal to 90° . So, we add them: $\angle ABC + \angle DEF$.

$$= 40^\circ + 140^\circ$$

$$= 180^\circ$$

Hence they are not complementary angles. (×)

c)



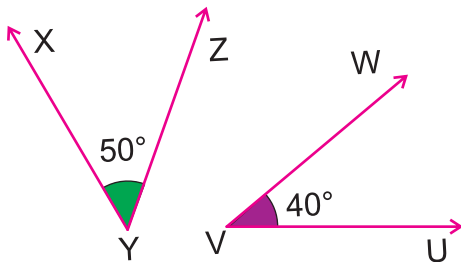
Answer: For two angles to be complementary, their sum should be equal to 90° . So, we add them: $\angle HFE + \angle EFG$.

$$= 135^\circ + 45^\circ$$

$$= 180^\circ$$

Hence they are not complementary angles.

d)



Answer: For two angles to be complementary, their sum should be equal to 90° . So, we add them: $\angle XYZ + \angle UVW$.

$$= 50^\circ + 40^\circ$$

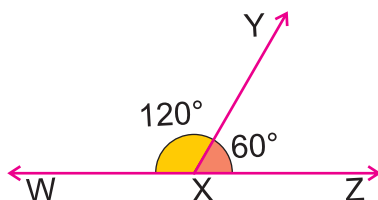
$$= 90^\circ$$

Hence they are complementary angles. (✓)

3. Identify and tick (✓) the pairs of supplementary angles.

Solution:

a)

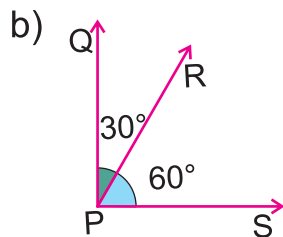


Answer: For two angles to be supplementary, their sum should be equal to 180° . So, we add them: $\angle WXY + \angle YXZ$.

$$= 120^\circ + 60^\circ$$

$$= 180^\circ$$

Hence these two angles are supplementary angles.



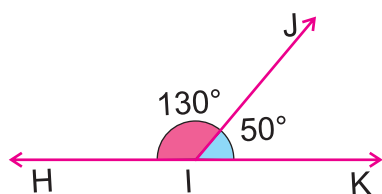
Answer: For two angles to be supplementary, their sum should be equal to 180° . So, we add them: $\angle QPR + \angle RPS$.

$$= 30^\circ + 60^\circ$$

$$= 90^\circ$$

Hence these two angles are not supplementary angles.

c)



Answer: For two angles to be supplementary, their sum should be equal to 180° . So, we add them: $\angle HIJ + \angle JIK$.

$$= 130^\circ + 50^\circ$$

$$= 180^\circ$$

Hence these two angles are supplementary angles. (✓)

4. Write the measures of the complementary angles for the given angles.

Solution:

(Note: As sum of the measure of complementary angles is equal to a right angle (90°). So if the measure of one complementary angle is known, the measure of the unknown complementary angle is found subtracting the known angle from 90°)

a) 25°

Solution:

$$\begin{aligned} \text{Complementary angle for } 25^\circ &= 90^\circ - 25^\circ \\ &= 65^\circ \end{aligned}$$

Complementary angle for 25° is 65°

b) 72°

Solution:

$$\begin{aligned}\text{Complementary angle for } 72^\circ &= 90^\circ - 72^\circ \\ &= 18^\circ\end{aligned}$$

So 18° is the complementary angle for 72°

c) 10°

Solution:

$$\begin{aligned}\text{Complementary angle for } 10^\circ &= 90^\circ - 10^\circ \\ &= 80^\circ\end{aligned}$$

So 80° is the complementary angle for 10°

d) 90°

Solution:

$$\begin{aligned}\text{Complementary angle for } 90^\circ &= 90^\circ - 9^\circ \\ &= 81^\circ\end{aligned}$$

So 81° is the complementary angle for 90°

e) 88°

Solution:

$$\begin{aligned}\text{Complementary angle for } 88^\circ &= 90^\circ - 88^\circ \\ &= 2^\circ\end{aligned}$$

So 2° is the complementary angle for 88°

5. Write the measures of the supplementary angles for the given angles.

Solution:

(Note: As sum of the measure of supplementary angles is equal to a straight angle i.e, 180° . So if the measure of one supplementary angle is known, the measure of second unknown supplementary angle can be known by subtracting the known supplementary angle from 180°)

a) 100°

Solution:

$$\begin{aligned}\text{Supplementary angle for } 100^\circ &= 180^\circ - 100^\circ \\ &= 80^\circ\end{aligned}$$

So 80° is the supplementary angle for 100°

b) 1°

Solution:

$$\begin{aligned}\text{Supplementary angle for } 1^\circ &= 180^\circ - 1^\circ \\ &= 179^\circ\end{aligned}$$

So 179° is the supplementary angle for 1°

c) 144°

Solution:

$$\begin{aligned}\text{Supplementary angle for } 144^\circ &= 180^\circ - 144^\circ \\ &= 36^\circ\end{aligned}$$

So 36° is the supplementary angle for 144°

d) 90°

Solution:

$$\begin{aligned}\text{Supplementary angle for } 90^\circ &= 180^\circ - 90^\circ \\ &= 90^\circ\end{aligned}$$

So 90° is the supplementary angle for 90° is 90°

e) 177°

Solution:

$$\begin{aligned}\text{Supplementary angle for } 177^\circ &= 180^\circ - 177^\circ \\ &= 3^\circ\end{aligned}$$

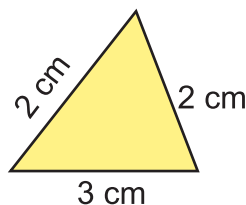
So 3° is the supplementary angle for 90° is 177°

Learning Check 7.3

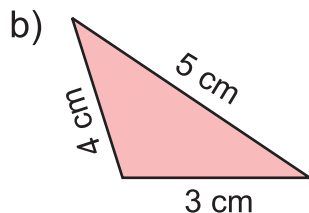
1. Identify the types of the following triangles with respect to their sides.

Solution:

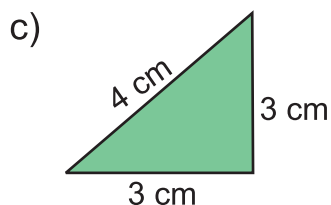
a)



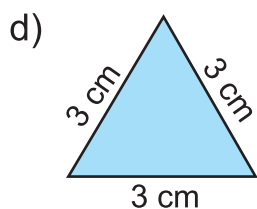
Answer: It is an Isosceles triangle as the length of its two sides is equal (2 cm).



Answer: It is a Scalene triangle as the lengths of all its three sides are different in measure.



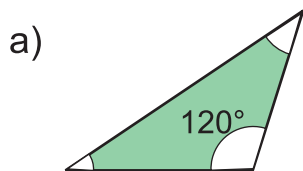
Answer: It is an Isosceles triangle as the lengths of its two sides are equal.



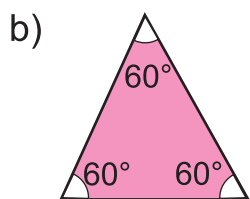
Answer: It is an equilateral triangle as the lengths of all its sides are equal in measure.

2. Identify the types of the following triangles with respect to their angles.

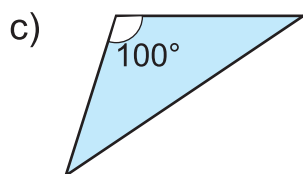
Solution:



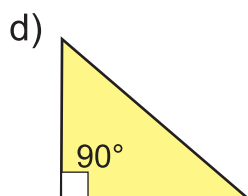
Answer: As the measure of one of its angle (120°) is greater than 90° , i.e. its is an obtuse angle, so this triangle is an obtuse-angled triangle.



Answer: As the measure of all the angles of this triangle are less than 90° i.e. all its angles are acute angles. so is an obtuse angle, so it is an acute-angled triangle.



Answer: As one of its angle is an obtuse angle, i.e. greater than 90° , so it is an obtuse-angled triangle.



Answer: As one of the angles of this triangle is a right angle i.e. 90° , so it is a right-angled triangle.

3. Identify and name the triangles on the basis of their sides as equilateral, isosceles or scalene triangles.

Solution:

a) 7 cm, 7 cm, 2 cm

It is an Isosceles triangle as the measure of its two sides are equal.

b) 5 cm, 3 cm, 6 cm

It is an Scalene triangle as the measure of all of its sides are different.

c) 2 cm, 2 cm, 2 cm

It is an equilateral triangle as the measure of all of its sides are equal.

d) 4 cm, 4 cm, 7 cm

It is an isosceles triangle as the measure of its two sides are equal.

e) 5 cm, 4 cm, 5 cm

It is an isosceles triangle as the measure of its two sides are equal.

f) 7 cm, 7.7 cm, 7.7 cm

It is an isosceles triangle as the measure of two of its sides are equal.

4. Identify and name the triangles on the basis of their angles as acute, obtuse or right-angled triangles.

a) 90° , 45° , 45°

As one of its angle is 90° . So, it is a right-angled triangle.

b) 30° , 60° , 90°

It is a right-angled triangle as one of its angles is a right-angle i.e. (90°)

c) 60° , 60° , 60°

It is an acute-angled triangle as all of its angles are smaller than 90° i.e. all are acute-angles.

d) 110° , 30° , 40°

It is an obtuse-angled triangle as the measure of one of its angles is greater than 90° (i.e. it is an obtuse-angle)

e) 30° , 50° , 100°

It is an obtuse-angled triangle as the measure of one of its angles is greater than 90° .

f) 105° , 65° , 10°

It is an obtuse-angled triangle as one of its angles is an obtuse angle (i.e. is greater than 90°)

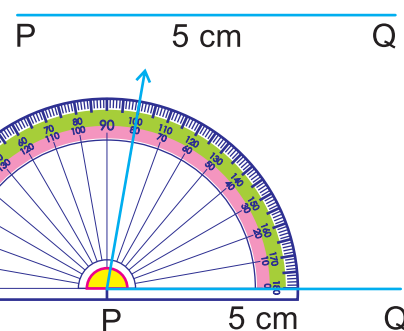
Learning Check 7.4

1. Draw a triangle PQR in which $m\angle P = 80^\circ$, $m\overline{PQ} = 5$ cm and $m\angle Q = 40^\circ$. Also measure the remaining angle and sides.

Solution:

Steps of construction:

Step I: Draw a line segment $\overline{PQ} = 5$ cm using a ruler.



Step II: Using a protractor, draw an angle of 80° at point P.

Step III: Similarly, using a protractor, draw an angle of 40° at point Q. The two drawn rays intersect at R.

Diagram of triangle PQR. Angle P is 80° , angle Q is 40° . Side PQ is 5 cm.

Note (The sum of the three angles of a triangle is equal to 180° , so we can find the third angle by subtracting the sum of the two given angles from 180° .)

so $m\angle R = 60^\circ$

Using a ruler we find the length of the remaining sides.

$$m\overline{QR} = \underline{\hspace{2cm}} \text{ cm}$$

$$\overline{mPQ} = 5 \text{ cm}, m\angle P = 80^\circ, m\angle Q = 40^\circ, m\angle R = 60^\circ$$

- $$m\angle A = 75^\circ, \overline{AB} = 6 \text{ cm}, m\angle B = 35^\circ$$

Step I: Draw a line segment $\overline{mAB} = 6$ cm using a ruler.

A semi-circular protractor is shown with its center at point A. A ray is drawn from the center at an angle of 75° from the horizontal baseline. The protractor has degree markings from 0 to 180. The horizontal baseline is labeled A on the left and B on the right. The arc of the protractor is divided into three colored regions: green from 0 to 45, pink from 45 to 135, and green from 135 to 180.

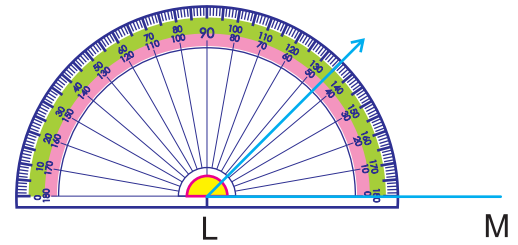
$$\begin{aligned}\angle A &= 75^\circ \quad \angle B = 35^\circ \\ \angle C &= 180^\circ - (75^\circ + 35^\circ) \\ &= 180^\circ - 110^\circ \\ &= 70^\circ\end{aligned}$$

so, $m\overline{AC} = \underline{\hspace{1cm}}$ cm
 $m\overline{BC} = \underline{\hspace{1cm}}$ cm

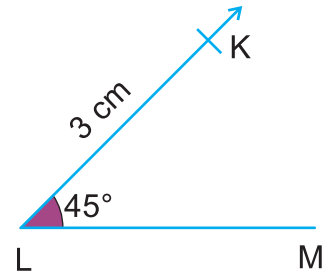
$$\overline{mAB} = 6 \text{ cm}, \angle A = 75^\circ, m\angle B = 35^\circ, m\angle C = 70^\circ$$



Step II: Using a protractor, draw an angle of 80° at point P.

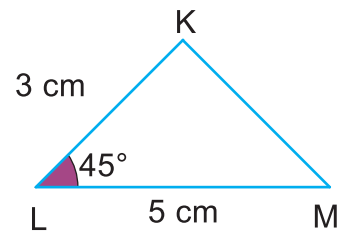


Step III: Using a ruler, mark a point K on the arm of 45° so that $\overline{KL} = 3 \text{ cm}$.



Join K to M.

$\triangle KLM$ is the required triangle.



- 4 Draw a triangle GHI in which $\overline{HI} = 4.9 \text{ cm}$, $\overline{GH} = 5.5 \text{ cm}$ and $\angle H = 65^\circ$.**

Solution:

Given:

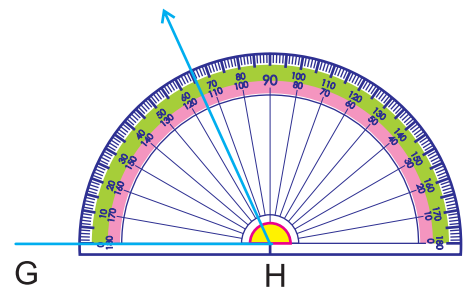
$$\overline{HI} = 4.9 \text{ cm}, \overline{HG} = 5.5 \text{ cm}, m\angle H = 65^\circ$$

Steps of construction:

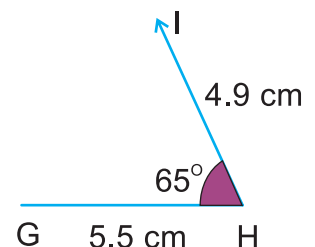
Step I: Draw a line segment $\overline{GH} = 5.5 \text{ cm}$ using a ruler.



Step II: Using a protractor, draw an angle of 65° at point H.

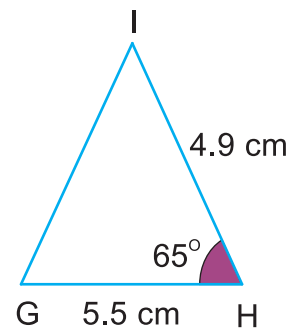


Step III: Using a ruler, mark a point I on the arm of 65° so that $\overline{HI} = 4.9 \text{ cm}$.



Step IV: Join H to I and G to I.

$\triangle GHI$ is the required triangle.

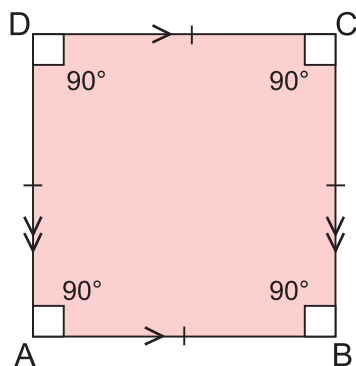


Learning Check 7.5

1. Draw these quadrilaterals. Then describe the properties of each.

Solution:

Square



Properties of square:

- 1) A square has four equal sides and four vertices.

$$m\overline{AB} = m\overline{BC} = m\overline{CD} = m\overline{DA}$$

- 2) Both pairs of opposite sides are parallel to each other.

$$AD \parallel BC$$

$$DC \parallel AB$$

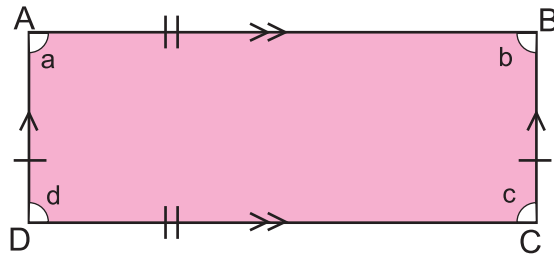
- 3) In a square all pairs adjacent sides are perpendicular to each other.

- 4) All angles in a square are right angles.

$$\angle A = \angle B = \angle C = \angle D = 90^\circ.$$

- 5) The sum of each pair of angles between any two parallel sides is equal to 180° .

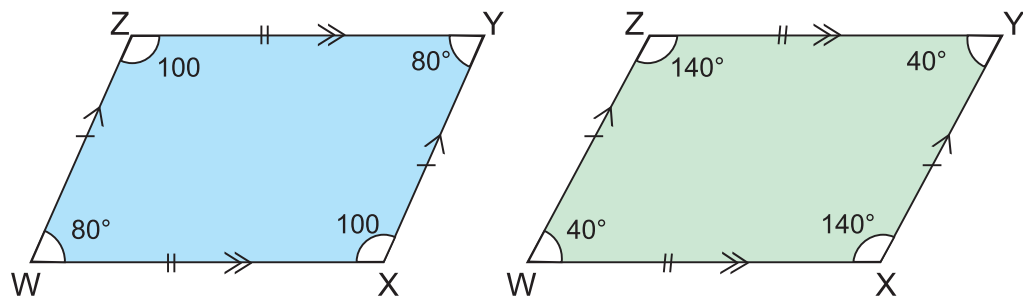
Rectangle



Properties of rectangle:

- 1) A rectangle has four sides and four vertices.
- 2) Both pairs of opposite sides are parallel to each other. i.e
 $AD \parallel BC, DC \parallel AB$
- 3) Both pairs of opposite sides are equal in length.
 $m\overline{AD} = m\overline{BC}, m\overline{AB} = m\overline{DC}$
- 4) All pairs of adjacent sides are perpendicular to each other and all angles are right angles.
 $\angle A = \angle B = \angle C = \angle D = 90^\circ$
- 5) The sum of each pair of angles between any two parallel sides is equal to 180° .

Parallelogram

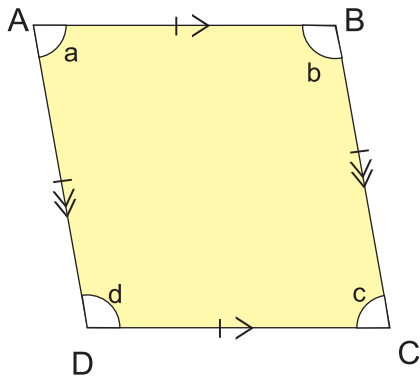


Properties of parallelogram:

- 1) It has four sides and four vertices.
- 2) Both pairs of opposite sides are parallel in each.
other i.e. $\overline{WX} \parallel \overline{ZY}, \overline{WZ} \parallel \overline{XY}$
- 3) Both pairs of opposite sides are equal in length.
 $m\overline{WX} = m\overline{ZY}, m\overline{WZ} = m\overline{XY}$
- 4) Both pairs of opposite angles are equal in length.
 $\angle W = \angle Y, \angle Z = \angle X$

- 5) The sum of each pair of angles between any two parallel sides is equal to 180° .

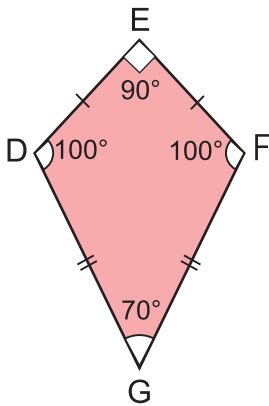
Rhombus



Properties of rectangle:

- 1) It has four sides and four vertices.
- 2) Both pairs of opposite sides are parallel in each.
- 3) All sides are equal in length.
- 4) Both pairs of opposite angles are equal in measure.
- 5) The sum of each pair of angles between any two parallel sides is equal to 180° .

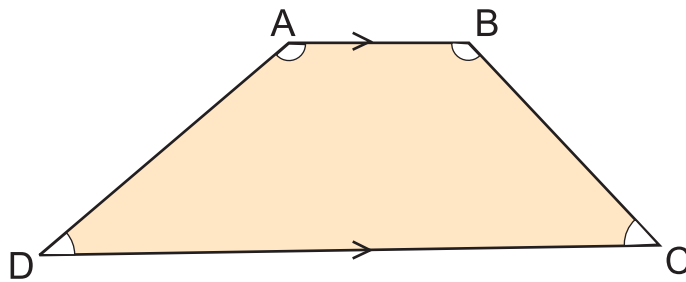
Kite



Properties of rectangle:

- 1) It has four sides and four vertices.
- 2) Both pairs of distinct adjacent sides are equal in length.
 $m\overline{AB} = m\overline{BC}$, $m\overline{AD} = m\overline{CD}$
- 3) Opposite sides are not equal in length.
- 4) Only one pair of opposite angles is equal.

Trapezium



Properties of rectangle:

- 1) It has four sides and four vertices.
- 2) Only one pair of opposite sides is parallel.

$$AB \parallel DC$$

- 3) The sum of each pair of angles between two parallel sides is equal to 180° .

Learning Check 7.6

1. Construct squares of the following lengths and write the steps of construction.

a) 4.2 cm

Solution:

Given:

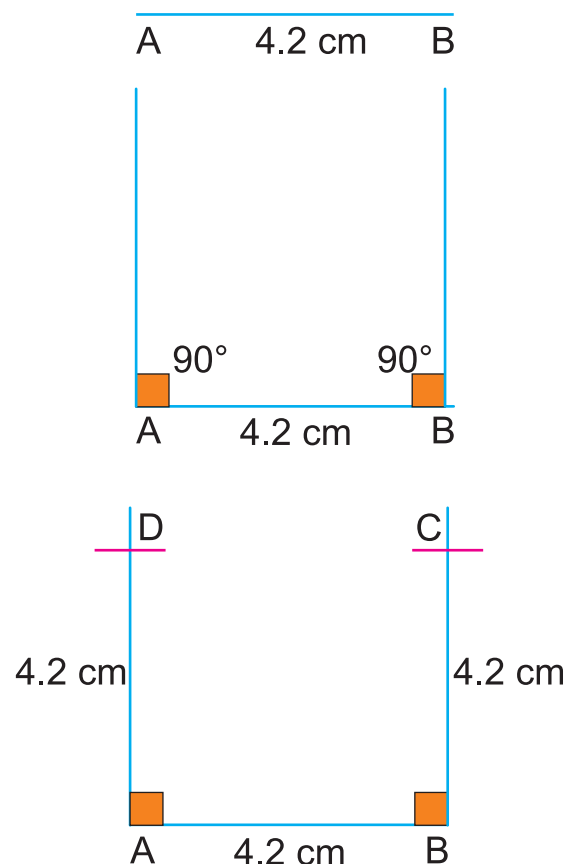
length of a side = 4.2 cm

Steps of construction:

Step I: Using a ruler draw line segment $\overline{mAB} = 4.2$ cm.

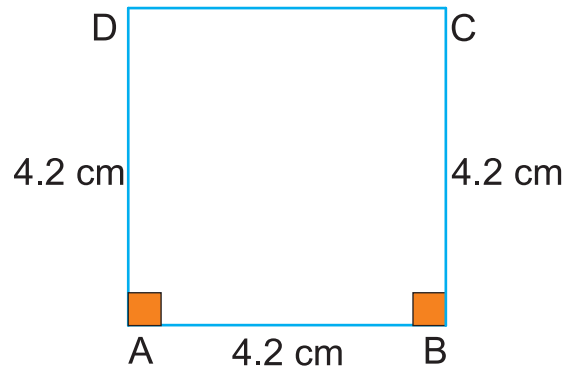
Step II: Using a protractor draw right angles at points A and B.

Step III: Mark points D and C on each of the arms of the two right angles respectively so that, $\overline{mAB} = \overline{mBC} = 4.2$ cm



Step IV: Joint D to C

ABCD is the required square.



b) 5.1 cm

Solution:

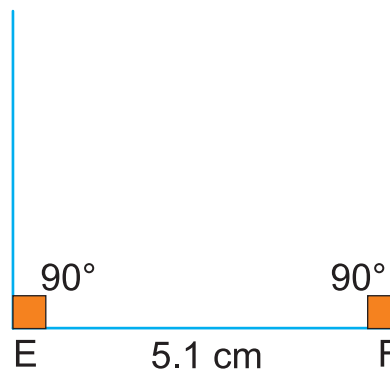
Given:

length of a side = 5.1 cm

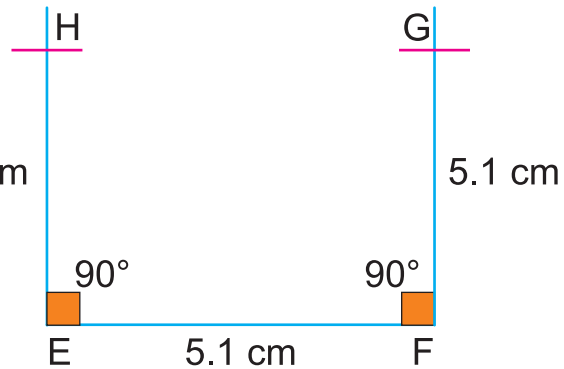
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{EF} = 5.1$ cm.

Step II: Using a protractor draw right angles at points E and F.

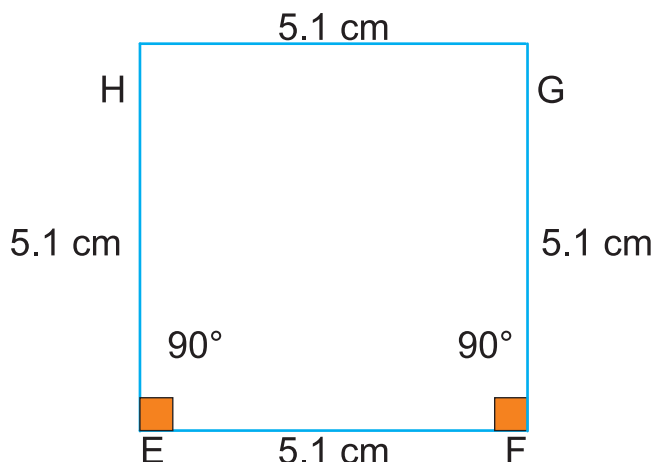


Step III: Mark points H and G on each of the arms of the two right angles respectively so that, 5.1 cm $\overline{EH} = \overline{FG} = 5.1$ cm



Step IV: Joint G to H

EFGH is the required square.



c) 6 cm

Solution:

Given:

length of a side = 6 cm

Steps of construction:

Step I: Using a ruler draw a line segment $\overline{PQ} = 6$ cm.

Step II: Using a protractor draw right angles at points P and Q.

Step III: Mark points S and R on each of the arms of the two right angles respectively so that, $\overline{PS} = \overline{QR} = 6$ cm

Step IV: Joint R to S
PQRS is the required square.

d) 3 cm

Solution:

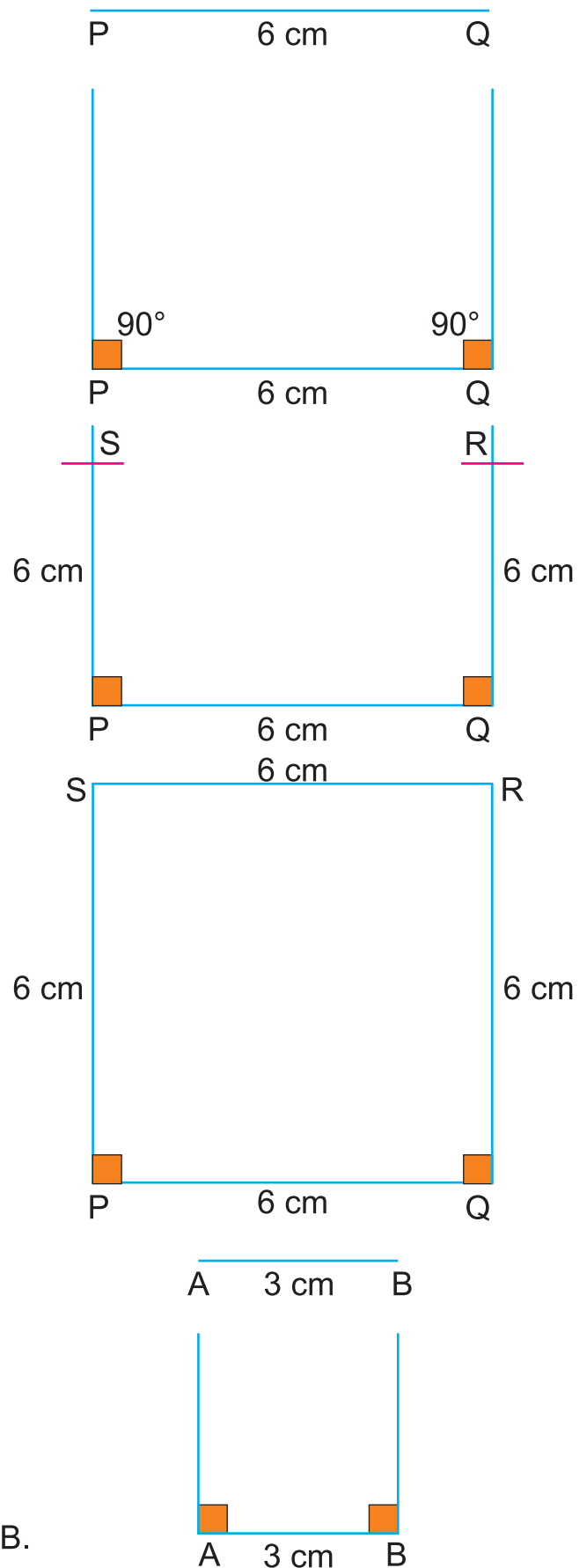
Given:

length of one side = 3 cm

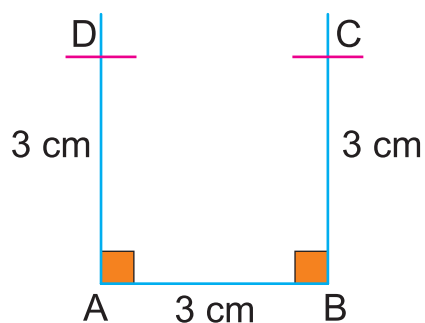
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{AB} = 3$ cm.

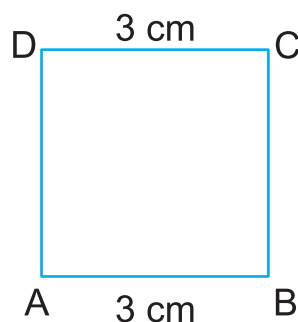
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points D and C on each of the arms of the two right angles respectively so that, $m\overline{AD} = m\overline{BC} = 3\text{ cm}$



Step IV: Joint D to C
ABCD is the required square.



e) 8 cm

Solution:

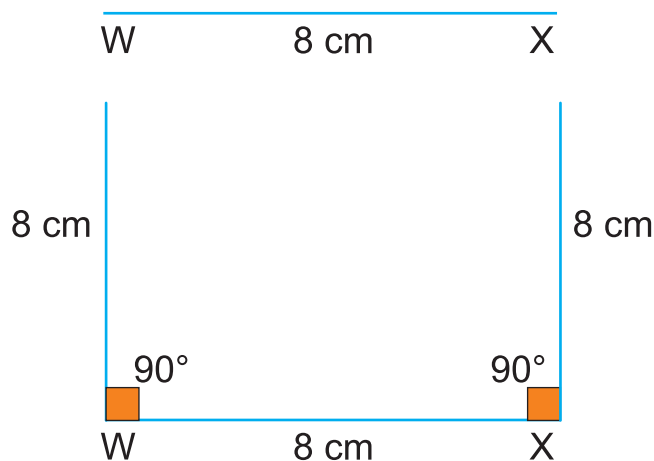
Given:

length of a side = 8 cm

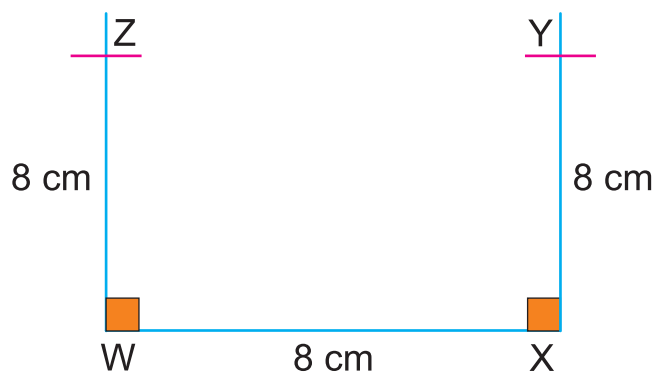
Steps of construction:

Step I: Using a ruler draw a line segment $m\overline{WX} = 8\text{ cm}$.

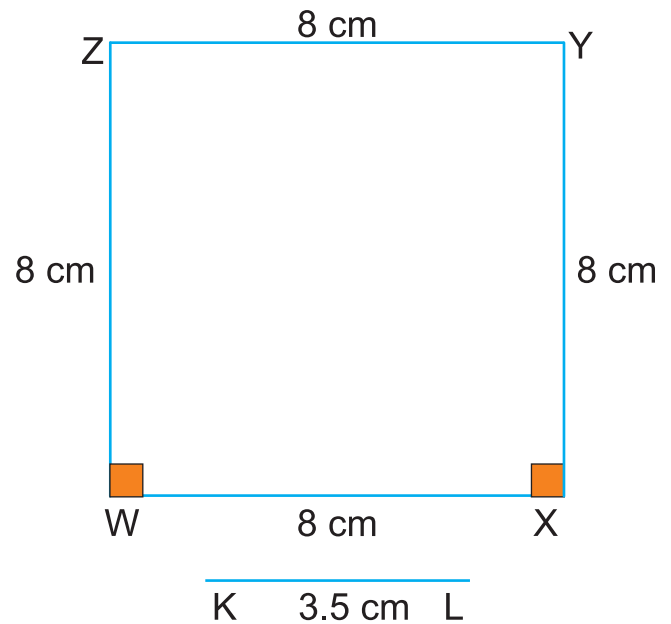
Step II: Using a protractor draw right angles at points W and X.



Step III: Mark points Z and Y on each of the arms of the two right angles respectively so that, $m\overline{WZ} = m\overline{XY} = 8\text{ cm}$



Step IV: Joint Y to Z
WXYZ is the required square.



f) 3.5 cm

Solution:

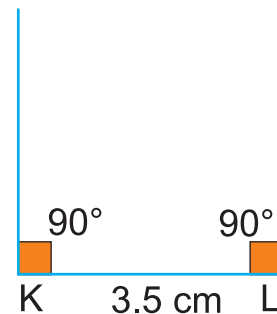
Given:

length of one side = 3.5 cm

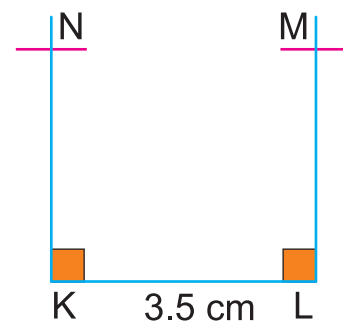
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{KL} = 3.5$ cm.

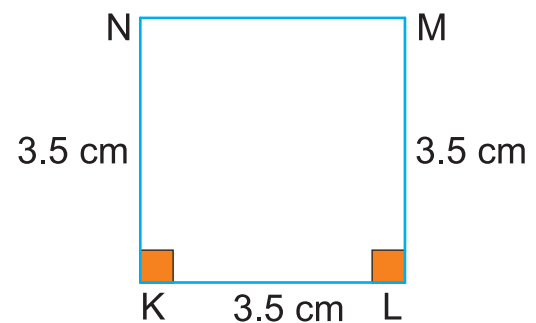
Step II: Using a protractor draw right angles at points K and L.



Step III: Mark points N and M on each of the arms of the two right angles respectively so that, $\overline{KN} = \overline{LM} = 3.5$ cm



Step IV: Joint M to N
KLMN is the required square.



g) 7.4 cm

Solution:

Given:

length of a side = 7.4 cm

Steps of construction:

Step I: Using a ruler draw a line segment $\overline{mAB} = 7.4$ cm.

Step II: Using a protractor draw right angles at points A and B.

Step III: Mark points D and C on each of the arms of the two right angles respectively so that, $\overline{mAD} = \overline{mBC} = 7.4$ cm

Step IV: Joint C to D
ABCD is the required square.

h) 6.5 cm

Solution:

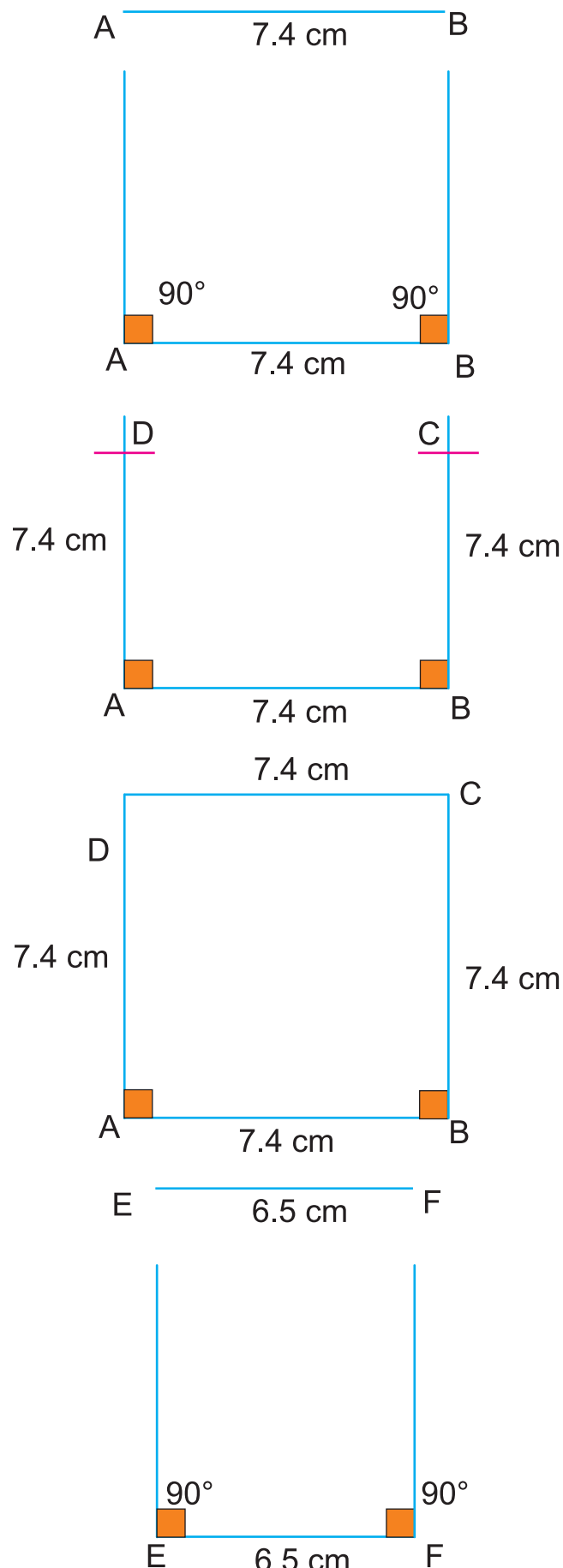
Given:

length of a side = 6.5 cm

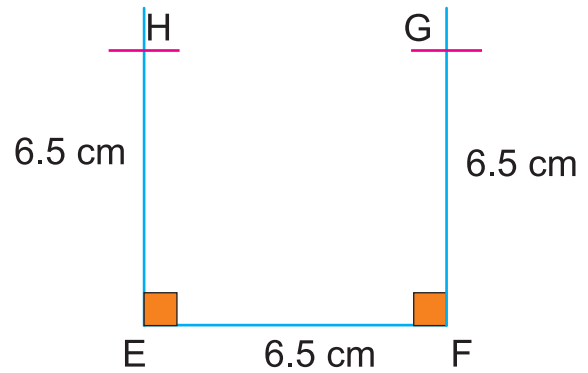
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{mEF} = 6.5$ cm.

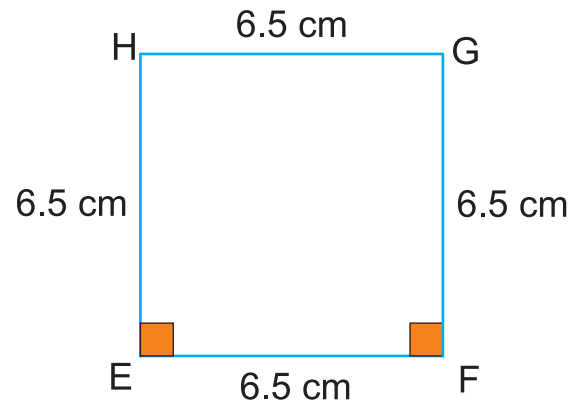
Step II: Using a protractor draw right angles at points E and F.



Step III: Mark points H and G on each of the arms of the two right angles respectively so that, $m\overline{EH} = m\overline{FG} = 6.5 \text{ cm}$



Step IV: Joint H to G. EFGH is the required square.



2. Construct rectangles of the following measurements and write the steps of construction.

a) Length = 6 cm and width = 4 cm

Solution:

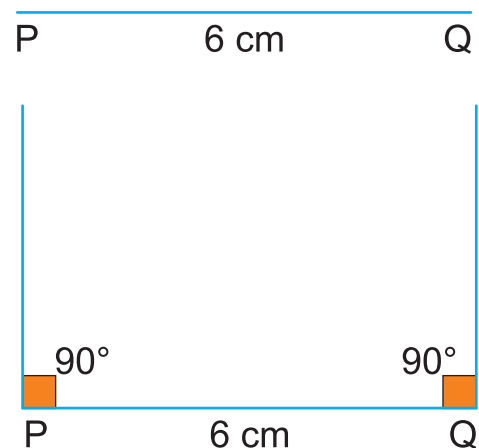
Given:

Length = 6 cm, width = 4 cm

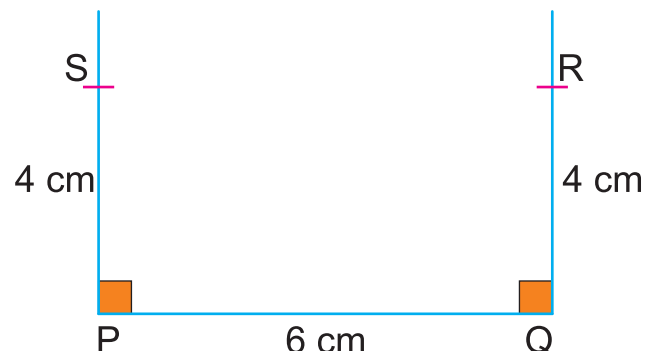
Steps of construction:

Step I: Using a ruler draw a line segment $m\overline{PQ} = 6 \text{ cm}$.

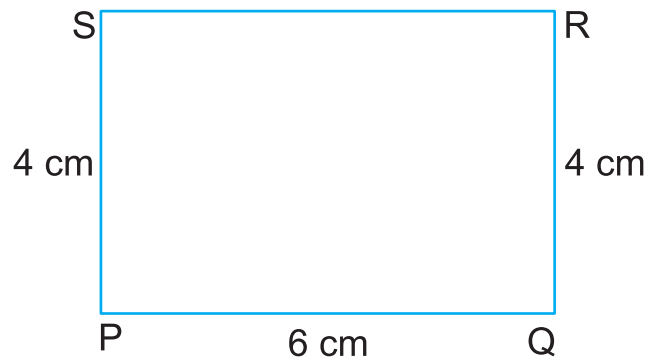
Step II: Using a protractor draw right angles at points P and Q.



Step III: Mark points S and R on each of the arms of the two right angles respectively so that, $m\overline{RQ} = m\overline{PS} = 4 \text{ cm}$



Step IV: Joint R to S
PQRS is the required rectangle.



b) Length = 5 cm and width = 3.5 cm

Solution:

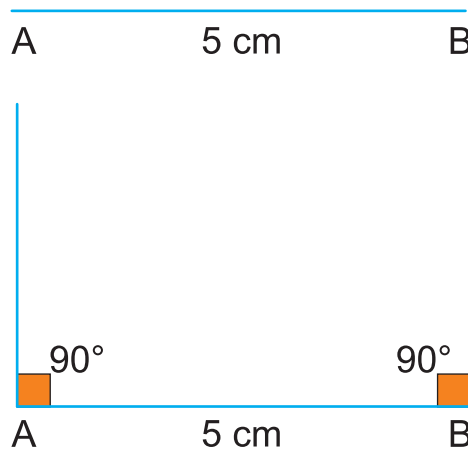
Given:

Length = 5 cm, width = 3.5 cm

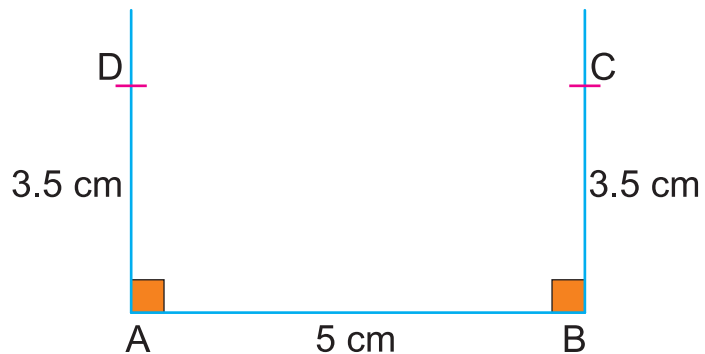
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{AB} = 5$ cm.

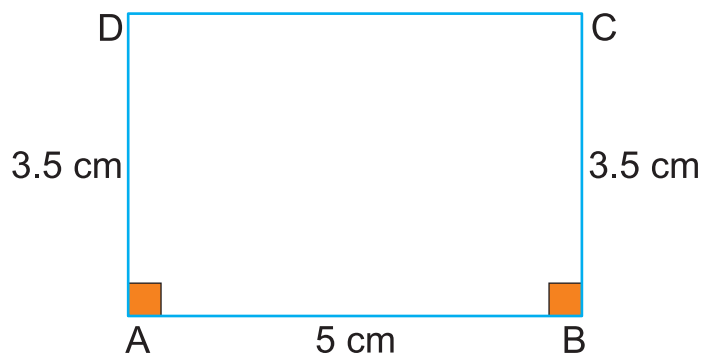
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $\overline{BC} = \overline{AD} = 3.5$ cm



Step IV: Joint C to D
ABCD is the required rectangle.



c) Length = 5.2 cm and width = 4.2 cm

Solution:

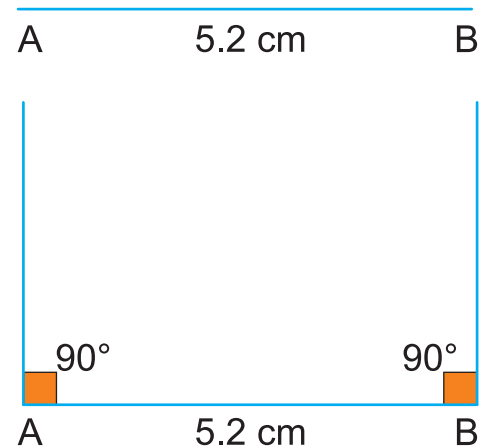
Given:

Length = 5.2 cm, width = 4.2 cm

Steps of construction:

Step I: Using a ruler draw a line segment $\overline{mAB} = 5.2$ cm.

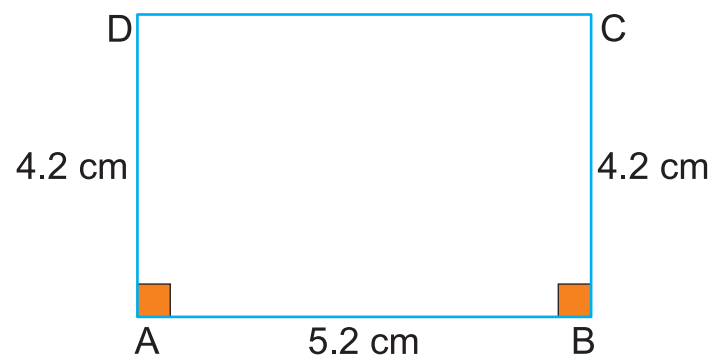
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $\overline{mBC} = \overline{mAD} = 4.2$ cm



Step IV: Joint C to D. ABCD is the required rectangle.



d) Length = 6.8 cm and width = 3 cm

Solution:

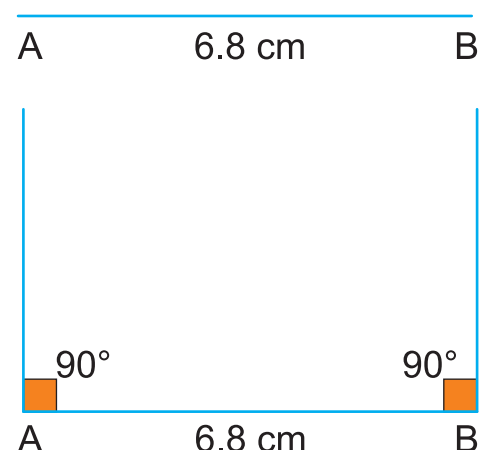
Given:

Length = 6.8 cm, width = 3 cm

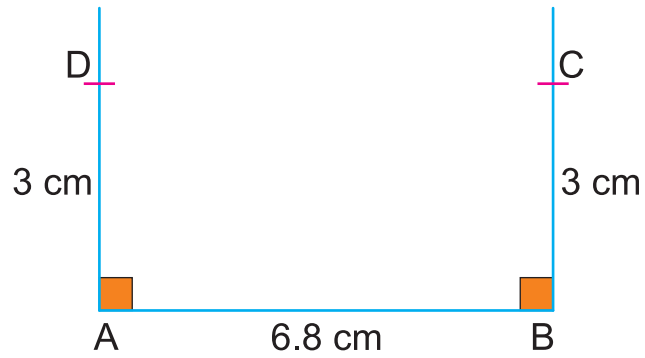
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{mAB} = 6.8$ cm.

Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $m\overline{BC} = m\overline{AD} = 3\text{ cm}$



Step IV: Joint C to D. ABCD is the required rectangle.



e) Length = 7 cm and width = 4 cm

Solution:

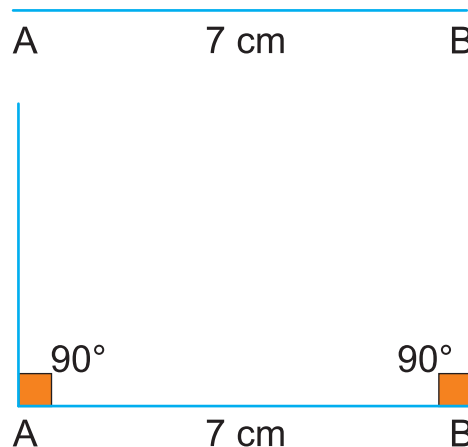
Given:

Length = 7 cm, width = 4 cm

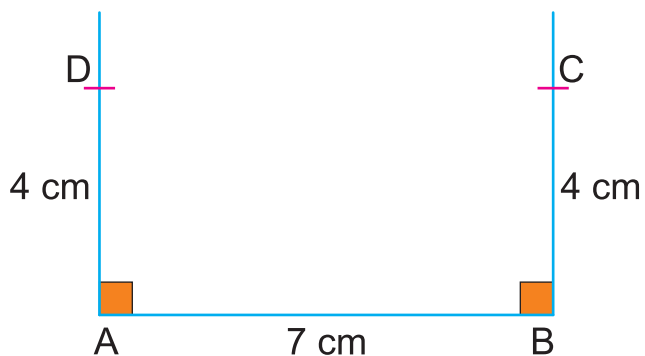
Steps of construction:

Step I: Using a ruler draw a line segment $m\overline{AB} = 7\text{ cm}$.

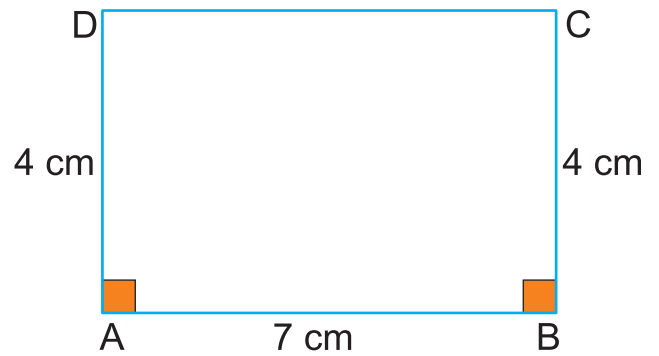
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $m\overline{BC} = m\overline{AD} = 4\text{ cm}$



Step IV: Joint D to C
ABCD is the required rectangle.



f) Length = 5 cm and width = 3 cm

Solution:

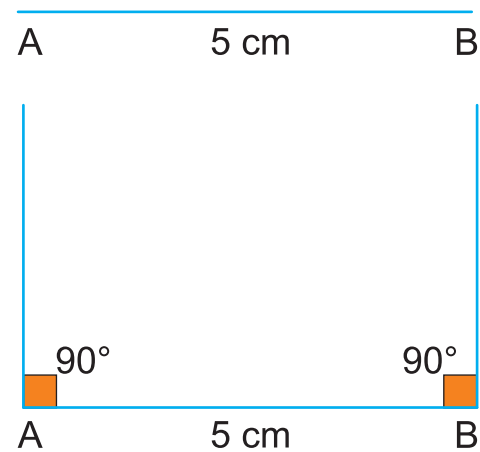
Given:

Length = 5 cm, width = 3 cm

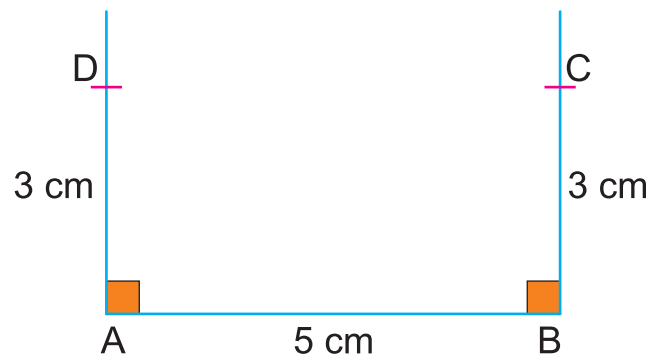
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{mAB} = 5$ cm.

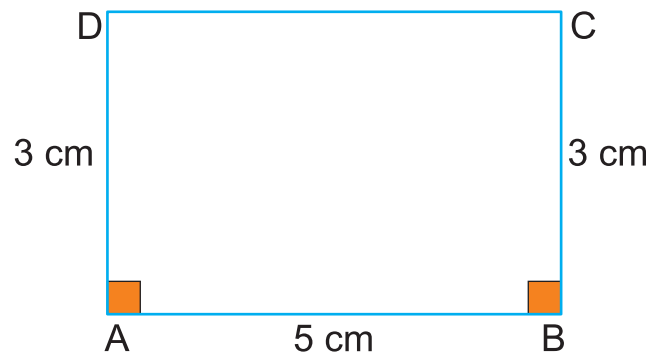
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $\overline{mBC} = \overline{mAD} = 3$ cm



Step IV: Joint D to C
ABCD is the required rectangle.



g) Length = 6 cm and width = 4 cm

Solution:

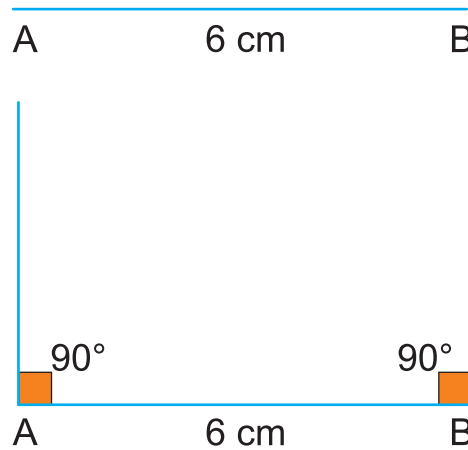
Given:

Length = 6 cm, width = 4 cm

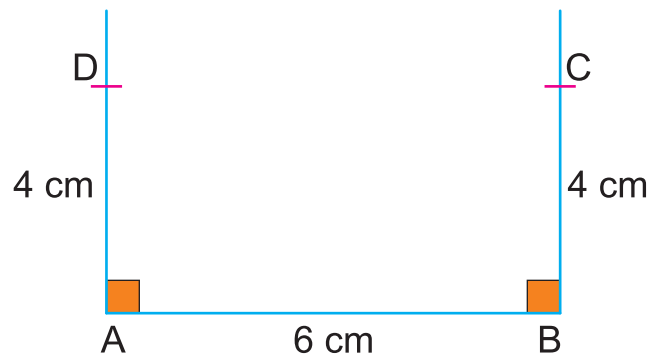
Steps of construction:

Step I: Using a ruler draw a line segment $\overline{AB} = 6$ cm.

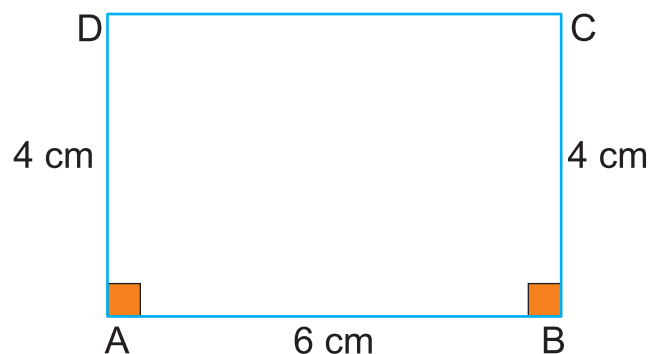
Step II: Using a protractor draw right angles at points A and B.



Step III: Mark points C and D on each of the arms of the two right angles respectively so that, $\overline{BC} = \overline{AD} = 4$ cm

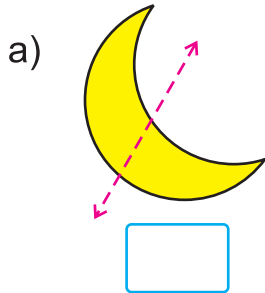


Step IV: Join D to C
ABCD is the required rectangle.

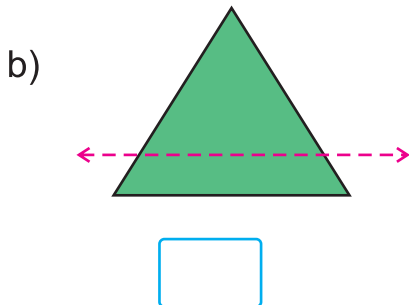


Learning Check 7.7

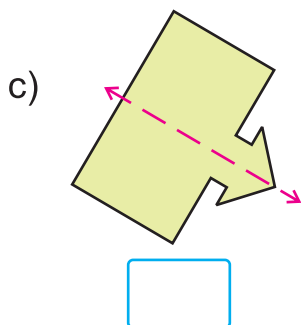
1. Tick (✓) the shape if the line dividing it is the line of symmetry.



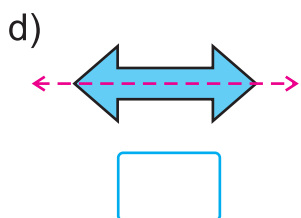
This line is not the line of symmetry as it does not divide this shape exactly in half, when folded.



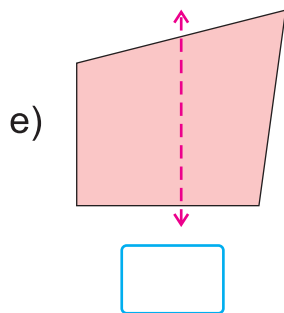
This line is not the line of symmetry as it does not divide this shape exactly in half, when folded.



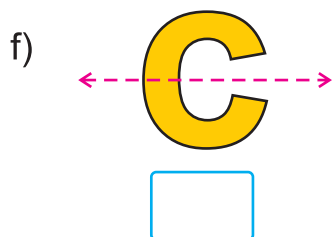
This line is the line of symmetry as it divides this shape exactly in half when folded along the line.



This line is the line of symmetry as it divides this shape exactly in half when folded along the line.

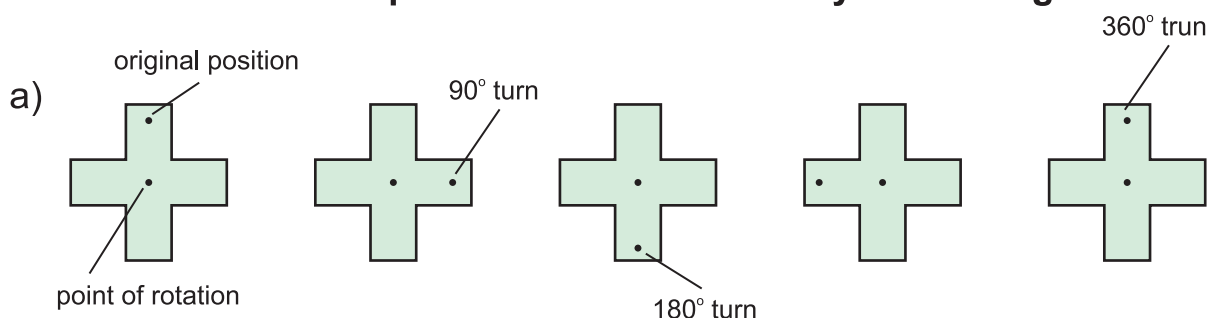


This line is not the line of symmetry as does not divide this shape exactly in half, when folded along the line.



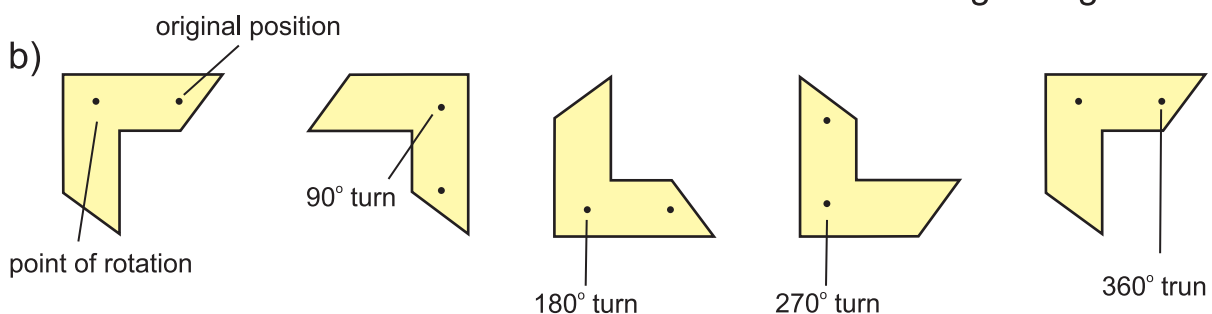
This line is the line of symmetry as it divides this shape exactly in half, when folded along the line.

2. Tick (✓) the figures that have rotational symmetry. Write the order of rotation and mark the point of rotation for the symmetric figures.

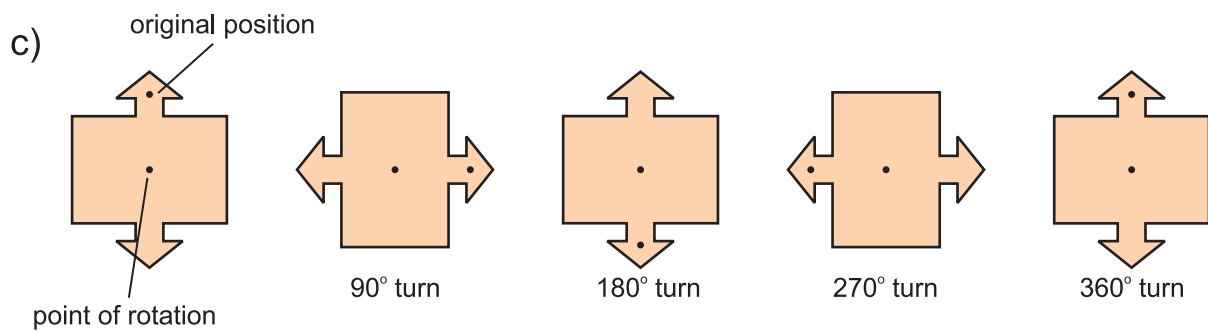


As this figure looks same as the original figure 4 times in full rotation, so it has rotational symmetry and the order of rotation is 4.

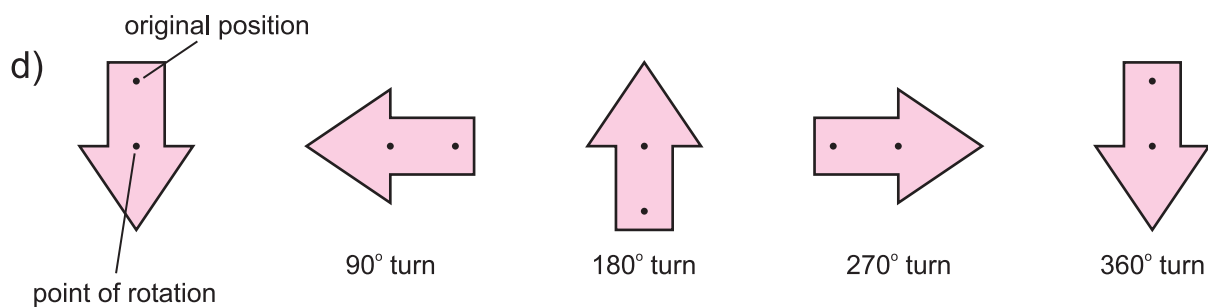
Note: For ease we can put a dot at a specific place of the figure. Then we rotate the object and see how many time in its rotation, does it look same as original figure.



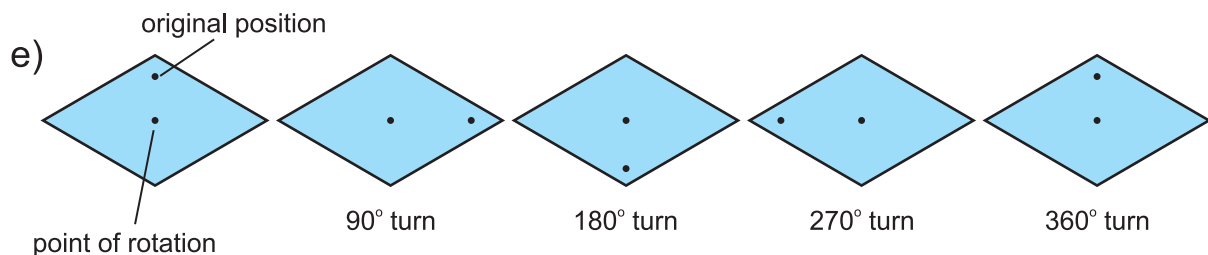
As this figure looks exactly same as the original figure only 1 time in full rotation, so it does not have rotational symmetry.



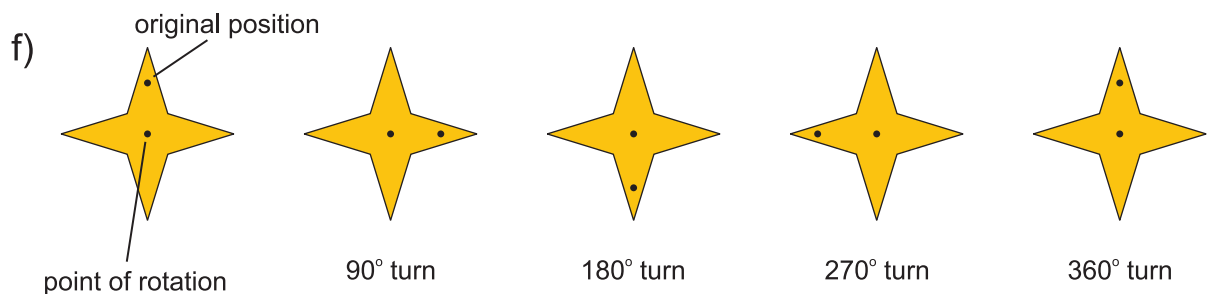
As this figure looks exactly same 2 times during a full rotation, so it has rotational symmetry and the order of rotation is 2.



As this figure looks exactly same only one time in full rotation, so it does not have rotational symmetry.



As this figure looks exactly same as the original figure 2 times in full rotation, so it has rotational symmetry and the order of rotation is 2.

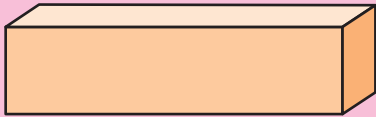


As the figure looks exactly same as original figure 4 times in a full rotation, so it has rotational symmetry and the order of rotation is 4.

Learning Check 7.8

1. Write the names, number of faces and shapes of faces of the following.

a)

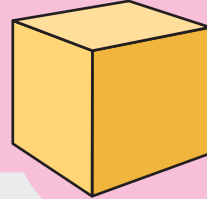


Name: cuboid

Number of faces: 6

Shapes of faces: rectangular

b)

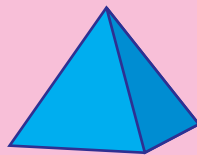


Name: cube

Number of faces: 6

Shapes of faces: square

c)

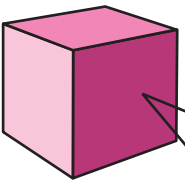


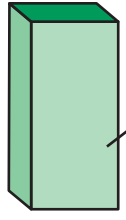
Name: square pyramid

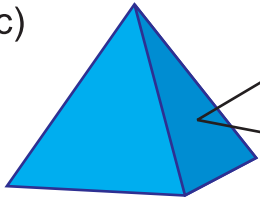
Number of faces: 5

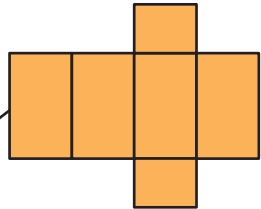
Shapes of faces: 1 square and 4 triangular

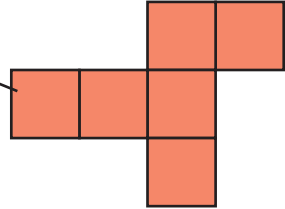
3. Write the names of these solids and then match them with their nets.

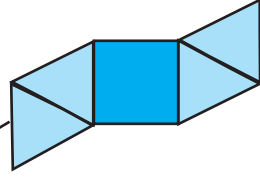
a)  cube

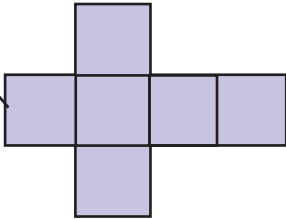
b)  cuboid

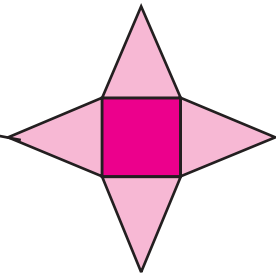
c)  square pyramid

 (cuboid)

 (cube)

 (square pyramid)

 (cube)

 (square pyramid)

Unit Check 7

1. Encircle the correct options.

a) (ii) angle

b) (ii) reflex

c) (ii) 90°

d) (iii) 4

e) (iv) 4

3. Construct the given angles of the following measures using a protractor.

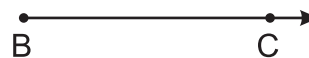
a) 90°

Solution: Suppose the name of the angle is $\angle ABC$.

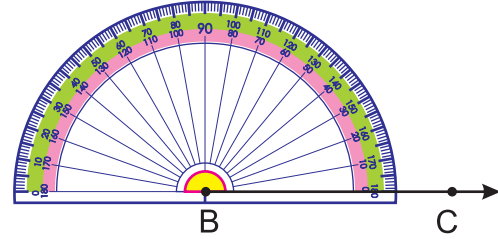
So, $\angle ABC = 90^\circ$

Steps of construction:

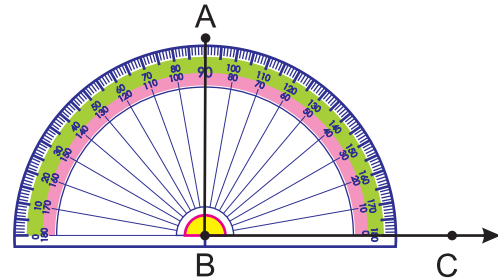
Step i: Draw a ray $\overrightarrow{BC}$ using a ruler.



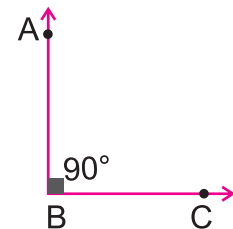
Step ii: Place the protractor on $\overrightarrow{BC}$ such that the center point of the protractor is exactly at point B and the baseline of the protractor is aligned with $\overrightarrow{BC}$.



Step iii: Read the scale on the protractor and mark a point A at 90° .



Step iv: Remove the protractor and join A to B, $m\angle ABC = 90^\circ$ is the required right angle.

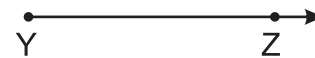


b) 180°

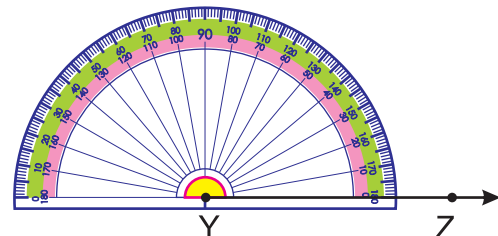
Suppose the name of the angle is $\angle XYZ$, so $\angle XYZ = 180^\circ$

Steps of construction:

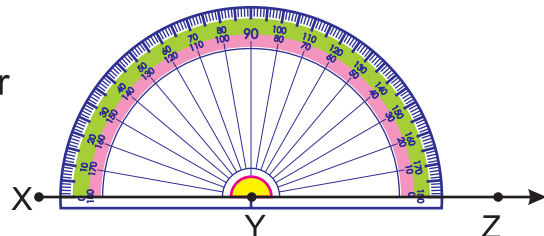
Step i: Draw a ray $\overrightarrow{YZ}$ using a ruler.



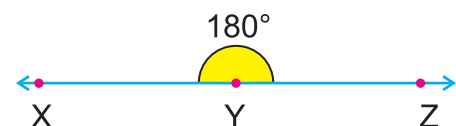
Step ii: Place the protractor on $\overrightarrow{YZ}$ such that the center point of the protractor is exactly at point Y and the base line of the protractor is aligned with $\overrightarrow{YZ}$.



Step iii: Read the scale on the protractor and mark a point X at 180° .



Step iv: Remove the protractor and join X to Y. $m\angle XYZ = 180^\circ$ is the required angle.



c) 200°

Solution: Suppose the name of the angle is $\angle RST$.

So, $\angle RST = 200^\circ$

200° is a reflex angle. To construct a reflex angle, first we subtract its value from 360° and then draw the resulting angle.

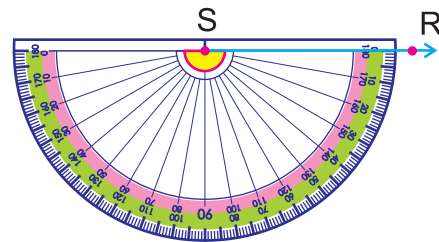
$$360^\circ - 200^\circ = 160^\circ$$

Steps of construction:

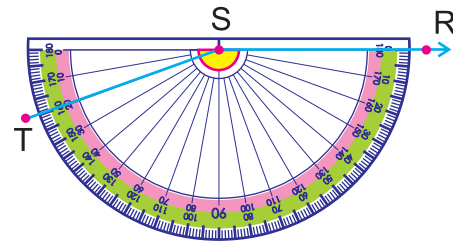
Step i: Draw a ray $\overrightarrow{SR}$ using a ruler.



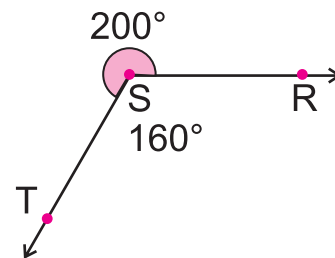
Step ii: Place the protractor upside down on SR so that the center of the protractor is exactly on point S and the baseline of the protractor is aligned with SR.



Step iii: Read the scale on the protractor and mark a point T at 160° .



Step iv: Remove the protractor and join S to T. $\angle RST = 200^\circ$ is the required angle.



d) 315°

Solution: Suppose the name of the angle is $\angle DEF$.

So, $\angle DEF = 315^\circ$, 315° is a reflex angle. To construct a reflex angle, first we subtract its value from 360° and then draw the resulting angle.

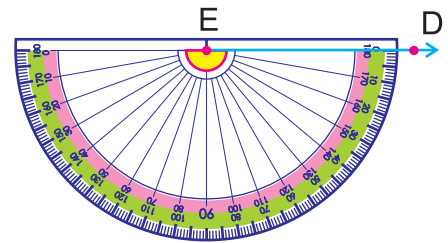
$$360^\circ - 315^\circ = 45^\circ$$

Steps of construction:

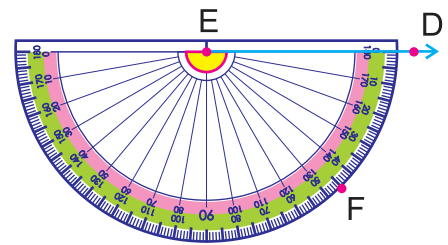
Step i: Draw a ray ED using a ruler.



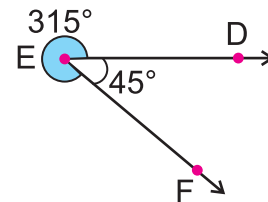
Step ii: Place the protractor upside down on $\overrightarrow{ED}$ so that the center point of the protractor is exactly on point E and the baseline of the protractor is aligned with $\overrightarrow{ED}$.



Step iii: Read the scale on the protractor and mark a point F at 45° .



Step iv: Remove the protractor and join E to F. $\angle DEF = 315^\circ$ is the required angle.



e) 195°

Solution: Suppose the name of the angle is $\angle JKL$.

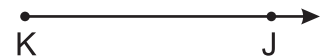
So, $\angle JKL = 195^\circ$

195° is a reflex angle. To construct a reflex angle, we subtract its value from 360° and then draw the resulting angle.

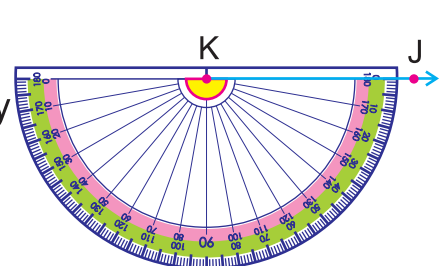
$$360^\circ - 195^\circ = 165^\circ$$

Steps of construction:

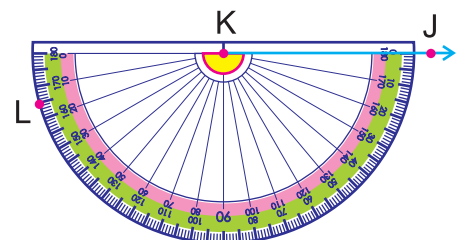
Step i: Draw a ray KJ using a ruler.



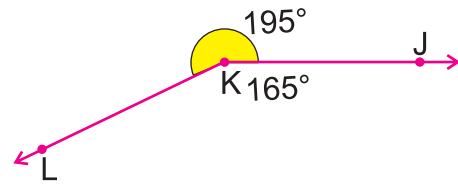
Step ii: Place the protractor upside down on $\overrightarrow{KJ}$ so that the center point of the protractor is exactly on point K and the baseline of the protractor is aligned with $\overrightarrow{JK}$.



Step iii: Read the scale on the protractor and mark a point L at 165° .



Step iv: Remove the protractor and join K to L.
 $\angle JKL = 195^\circ$ is the required angle.



3. Write the measure of the complementary angles for the given angles.

a) 15°

Solution: Complementary angle for $15^\circ = 90^\circ - 15^\circ = 75^\circ$
 so, 75° is the complementary angle for 15° .

b) 32°

Solution: Complementary angle for $32^\circ = 90^\circ - 32^\circ$
 $= 58^\circ$.

so, 58° is the complementary angle for 32° .

c) 40°

Solution: complementary angle for $40^\circ = 90^\circ - 40^\circ$
 $= 50^\circ$.

so, 50° is the complementary angle for 40° .

4. Write the measure of the supplementary angles for the given angles.

a) 105°

Solution: Supplementary angle for $105^\circ = 180^\circ - 105^\circ$
 $= 75^\circ$.

so, 75° is the supplementary angle for 105° .

b) 70°

Solution: Supplementary angle for $70^\circ = 180^\circ - 70^\circ$
 $= 110^\circ$.

so, 110° is the supplementary angle for 70° .

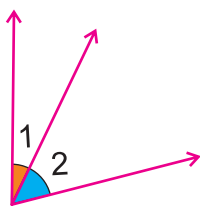
c) 55°

Solution: Supplementary angle for $55^\circ = 180^\circ - 55^\circ$
 $= 125^\circ$.

so, 125° is the supplementary angle for 55° .

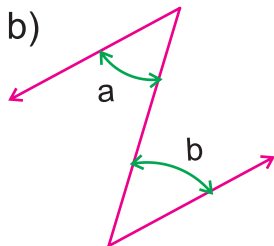
5. Identify and tick (✓) the adjacent angles.

a)



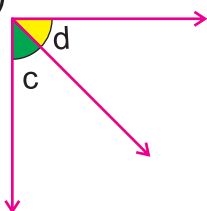
Answer: (✓) Angle 1 and 2 adjacent angles as they have both a common vertex and a common arm.

b)



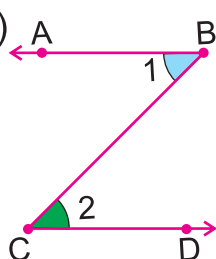
Answer: (×) Angle a and b are not adjacent angles as they have a common arm but do not have a common vertex.

c)



Answer: (✓) Angle c and d are adjacent angles as they have both common arm and common vertex.

d)



Answer: (×) Angle 1 and 2 are not adjacent angles as they have a common arm but don't have a common vertex.

6. Construct a triangle BCD where $\angle BCD = 40^\circ$, $\angle CDB = 70^\circ$ and $m\overline{CD} = 8$ cm.

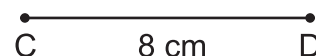
Solution:

Given:

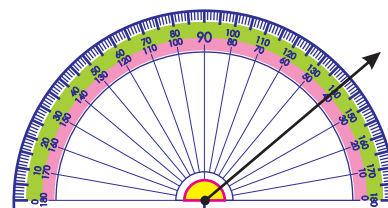
$$\angle BCD = 40^\circ, \angle CDB = 70^\circ, m\overline{CD} = 8\text{ cm}$$

Steps of construction:

Step i: Draw a line segment $m\overline{CD} = 8$ cm using a ruler.

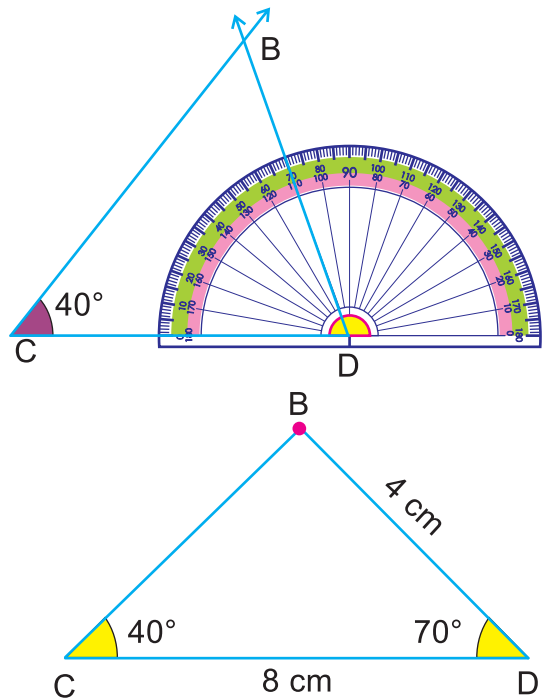


Step ii: Using a protractor draw an angle of 40° at point C.



Step iii: Similarly using a protractor draw an angle of 70° at point D. The two drawn intersect each other at point B.

$\triangle BCD$ is the required triangle.



7. Construct a triangle PQR where $\angle PQR = 72^\circ$, $PR = 6$ cm and $m\overline{QR} = 5$ cm.

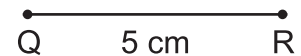
Solution:

Given:

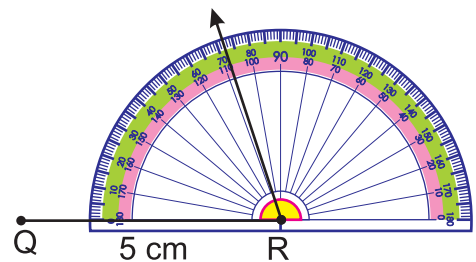
$\angle PQR = 72^\circ$, $PR = 6$ cm and $m\overline{QR} = 5$ cm

Steps of construction:

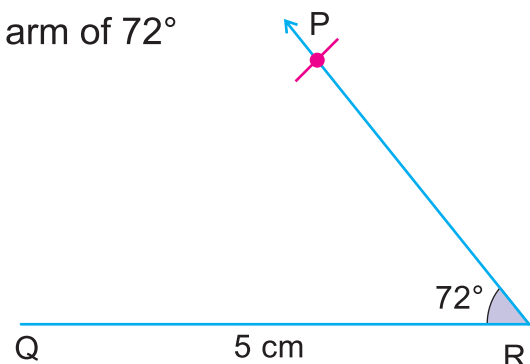
Step i: Draw a line segment $\overline{QR} = 5$ cm using a ruler.



Step ii: Using a protractor draw an angle of 72° at point R.

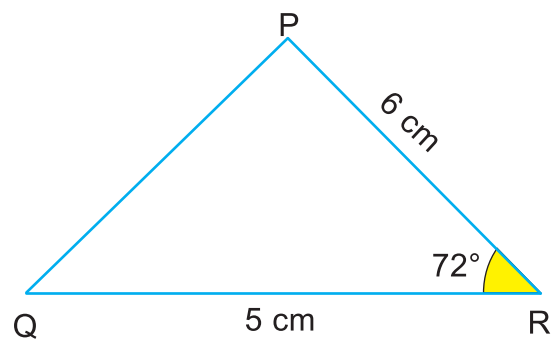


Step iii: Using a ruler mark a point P on the arm of 72° so that $m\overline{PR} = 6$ cm.



Step iv: Join P to Q and P to R.

$\triangle PQR$ is the required triangle.



8. Tick (✓) the boxes for the correct properties of each quadrilateral.

Quadrilateral	One pair of parallel sides	Two pairs of parallel sides	No pair of parallel sides	One pair of equal sides	Two pairs of equal sides	No pair of equal sides	All sides equal
a) Square 		✓					✓
b) Rectangle 		✓			✓		
c) Parallelogram 		✓			✓		
d) Rhombus 		✓					✓
e) Trapezium 	✓					✓	
f) Kite 			✓		✓		

9. Construct the squares of the following lengths and write the steps of construction.

a) 2 cm

Solution:

Given:

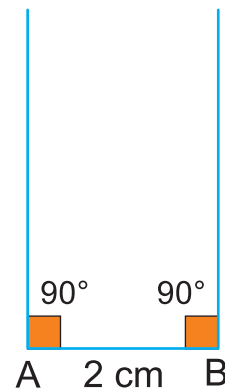
Length of a side = 2 cm

Steps of construction:

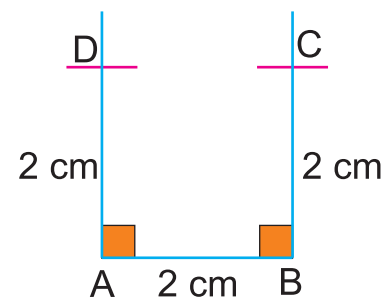
Step i: Draw a line segment $\overline{AB} = 2$ cm using a ruler.

A 2 cm B

Step ii: Using a protractor draw an angle of 90° on points A and B.

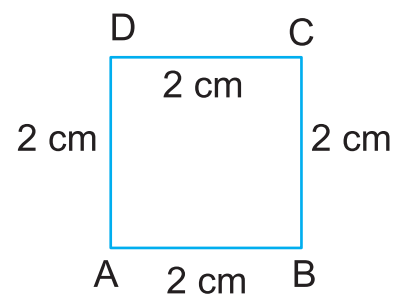


Step iii: Mark points C and D on the arms of both the angles so that $m\overline{BC} = m\overline{AD} = 2$ cm



Step iv: Join point D to C.

ABCD is the required square.



b) 5.1 cm

Solution:

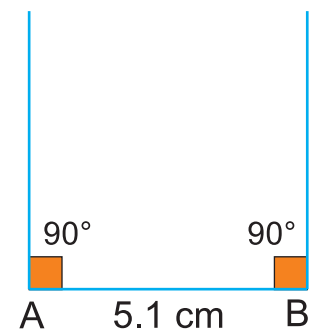
Given:

Length of a side = 5.1 cm

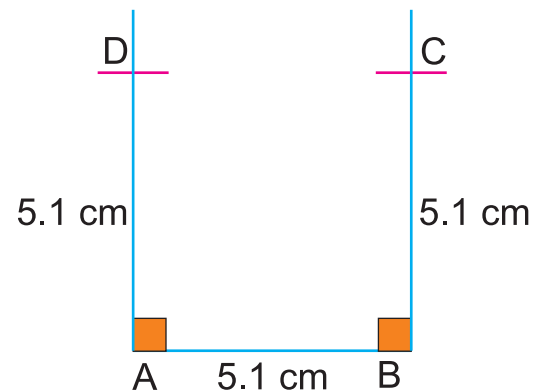
Steps of construction:

Step i: Draw a line segment $m\overline{AB} = 5.1$ cm using a ruler. A 5.1 cm B

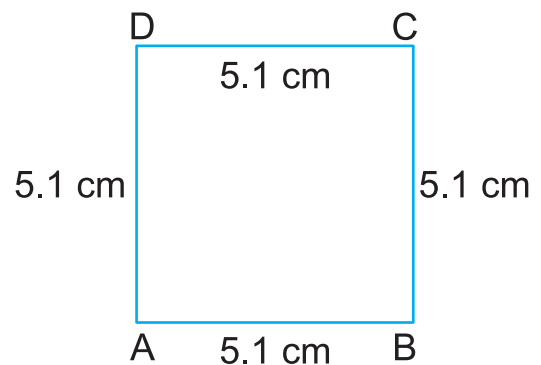
Step ii: Using a protractor draw an angle of 90° on points A and B.



Step iii: Mark points C and D on the arms of both the angles respectively, so that $m\overline{BC} = m\overline{AD} = 5.1$ cm



Step iv: Join point C to D.
ABCD is the required square.



c) 8 cm

Solution:

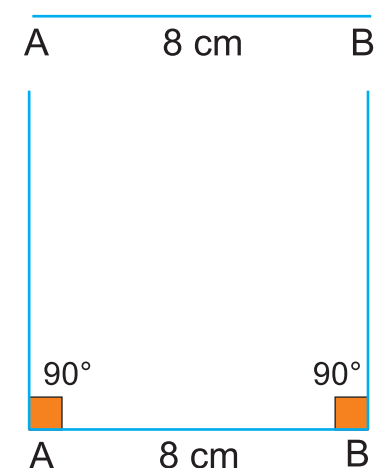
Given:

Length of a side = 8 cm

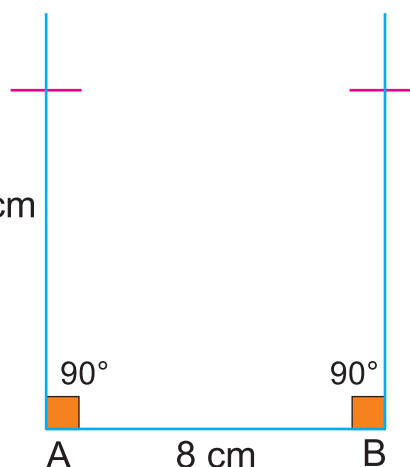
Steps of construction:

Step i: Draw a line segment $\overline{AB} = 8$ cm using a ruler.

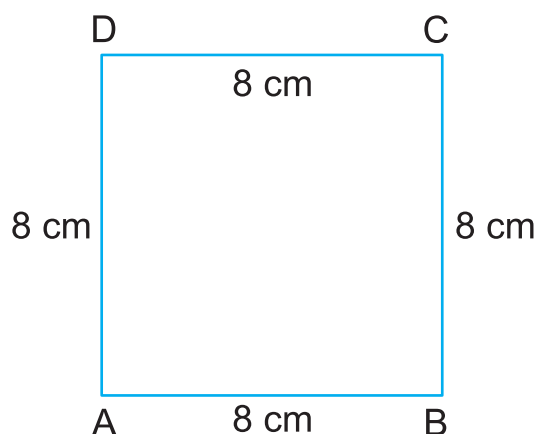
Step ii: Using a protractor draw an angle of 90° on points A and B.



Step iii: Mark points C and D on the arms of both the angles respectively, so that $m\overline{BC} = m\overline{AD} = 2\text{cm}$



Step iv: Join point C to D.
ABCD is the required square.



10. Construct the rectangles of the following measurements and write the steps of construction.

i) Length = 6 cm and width = 3 cm

Solution:

Given:

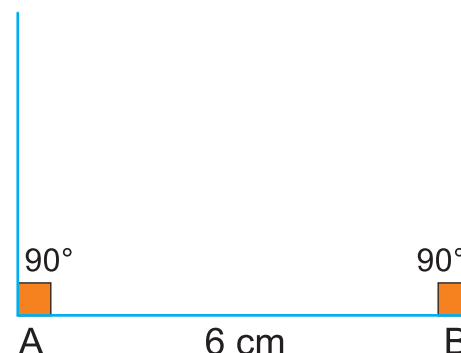
Length = 6 cm, width = 3 cm

Steps of construction:

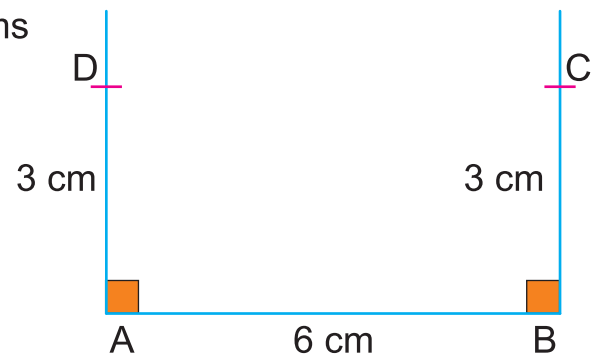
Step i: Draw a line segment $AB = 6\text{ cm}$ using a ruler.



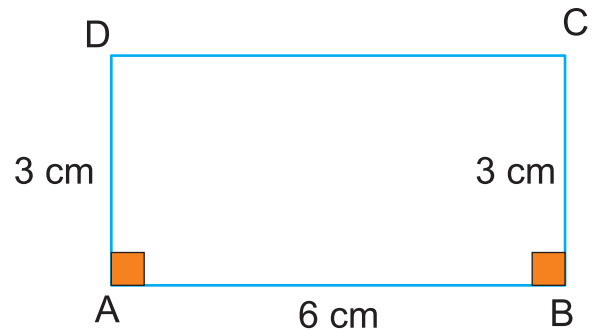
Step ii: Using a protractor draw angles of 90° on points A and B.



Step iii: Mark points C and D on the arms of both the angles respectively, so that $m\overline{BC} = m\overline{AD} = 3\text{ cm}$



Step iv: Join point C to D.
ABCD is the required square.



ii) Length = 9.4 cm and width = 5 cm

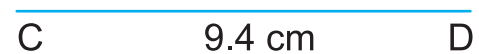
Solution:

Given:

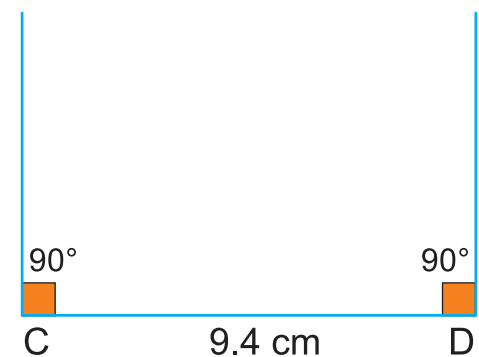
Length = 9.4 cm, width = 5 cm

Steps of construction:

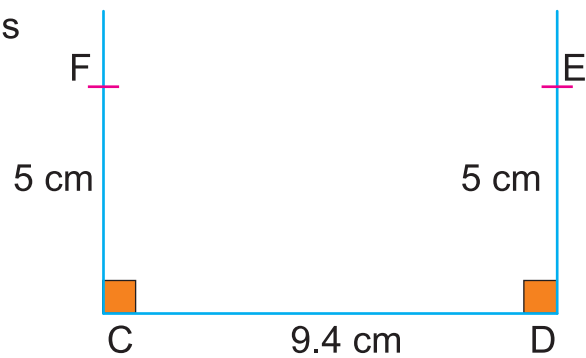
Step i: Draw a line segment CD = 9.4 cm using a ruler.



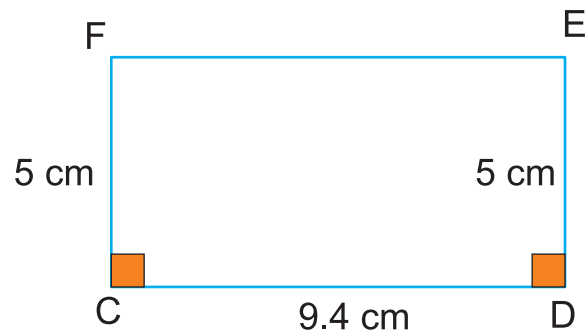
Step ii: Using a protractor draw angles of 90° on points C and D.



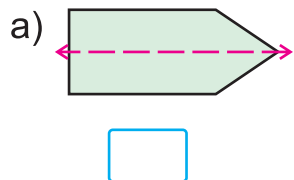
Step iii: Mark points E and F on the arms of both the angles respectively, so that $m\overline{DE} = m\overline{CF} = 5\text{ cm}$



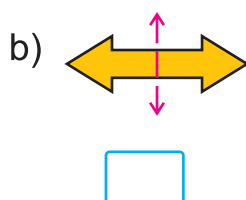
Step iv: Join point E to F.
CDEF is the required square.



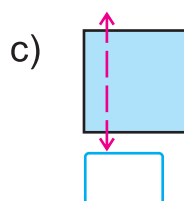
11. Tick (✓) the shapes if the line dividing it is the line of symmetry.



It is the line of symmetry as it divides the figure exactly into two same halves, when folded along the line.

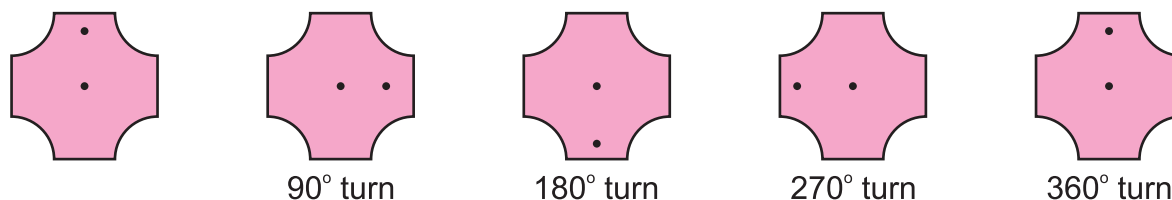
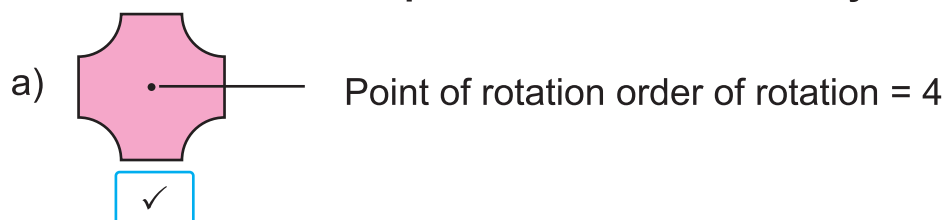


It is the line of symmetry as it divide the figure exactly into two equal halves, when folded along the line.

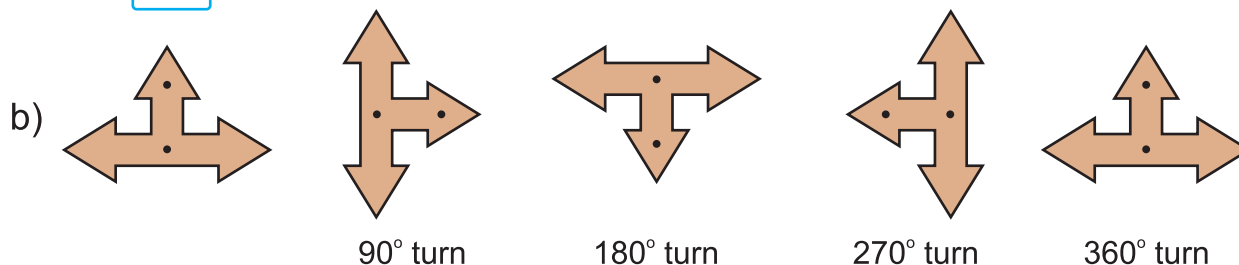
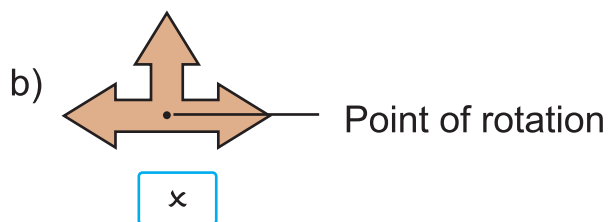


It is not the line of symmetry as it does not divide this shape exactly in half, when folded along the line.

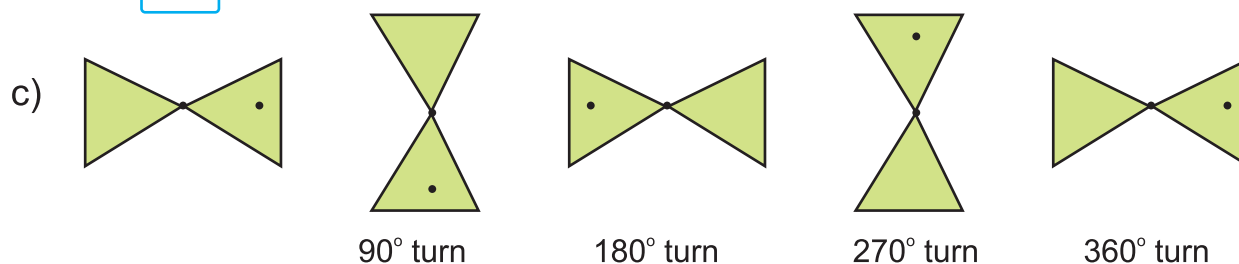
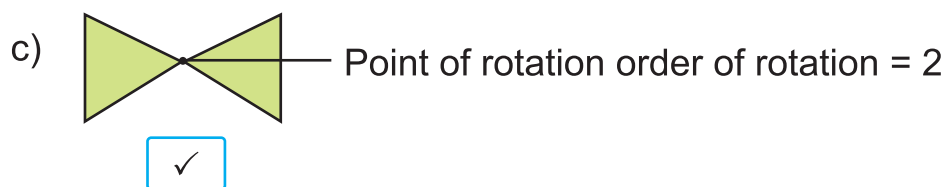
12. Tick (✓) the figures that have rotational symmetry. Write the order of rotation and mark the point of rotation for the symmetric figures.



As this figure when rotated along its center point, looks exactly same as original 4 times, so it has rotational symmetry and the order of rotation is 4.

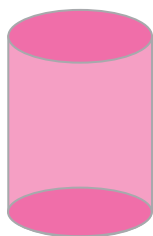


As this figure looks exactly same only once during a full rotation so it does not have a rotational symmetry.

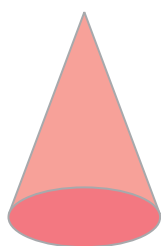


As this figure looks exactly same two (2) time during a full rotation around its axis, so it has rotational symmetry and the order of rotation is 2.

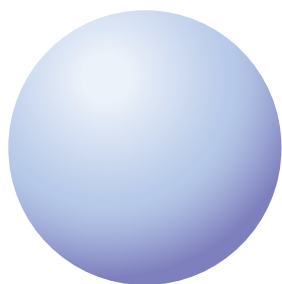
13. Draw a cylinder, a cone and a sphere and then write the number and shape of their faces.



Number of faces = 2
Shapes of faces = circle

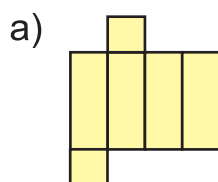


Number of faces = 1
Shapes of faces = circle

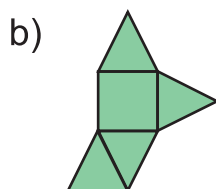


Number of faces = 0

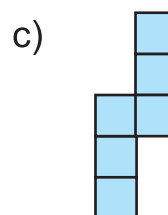
14. Write the name of the 3-D solids for these nets.



Cuboid



Square pyramid

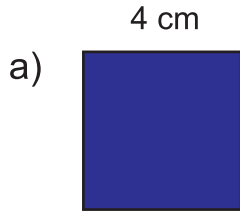


Cube

Unit 8: Perimeter and Area

Learning Check 8.1

1. Find the perimeter of these squares by using the formula.



Solution:

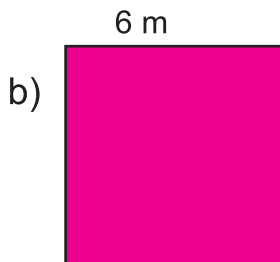
Given:

Length of a side = $L = 4$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 4 \text{ cm} \\ &= 16 \text{ cm}\end{aligned}$$

So the perimeter of the square is 16 cm.



Solution:

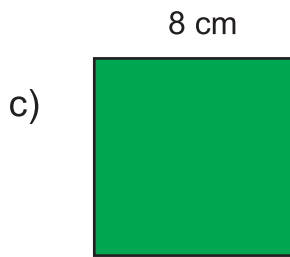
Given:

Length of a side = $L = 6$ m

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 6 \text{ m} \\ &= 24 \text{ m}\end{aligned}$$

So the perimeter of the square is 24 m.



Solution:

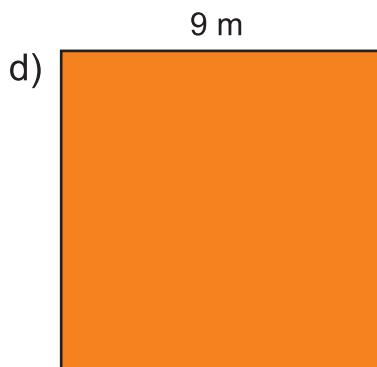
Given:

Length of a side = $L = 8 \text{ cm}$

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 8 \text{ cm} \\ &= 32 \text{ cm}\end{aligned}$$

So the perimeter of the square is 32 cm.



Solution:

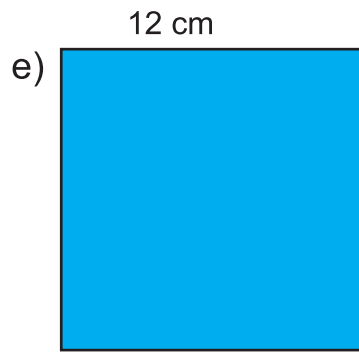
Given:

Length of a side = $L = 9 \text{ m}$

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 9 \text{ m} \\ &= 36 \text{ m}\end{aligned}$$

So the perimeter of the square is 36 m.



Solution:

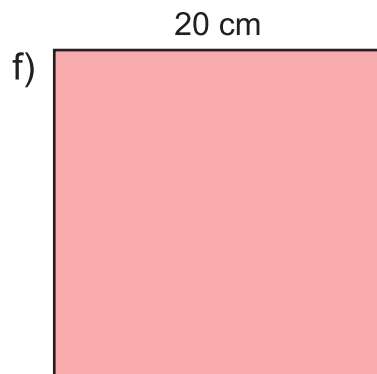
Given:

Length of a side = $L = 12 \text{ cm}$

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 12 \text{ cm} \\ &= 48 \text{ cm}\end{aligned}$$

So the perimeter of the square is 48 cm.



Solution:

Given:

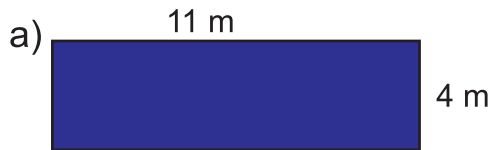
Length of a side = $L = 20 \text{ cm}$

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length of a side} \\ &= 4 \times L \\ &= 4 \times 20 \text{ cm} \\ &= 80 \text{ cm}\end{aligned}$$

So the perimeter of the square is 80 cm.

2. Find the perimeter of these rectangles by using the formula.



Solution:

Given:

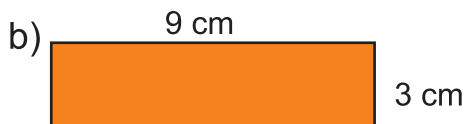
Length of the rectangle = $L = 11\text{ m}$

Width of the rectangle = $W = 4\text{ m}$

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (11 + 4) \\ &= 2 \times 15\text{ m} \\ &= 30\text{ m}\end{aligned}$$

So the perimeter of the rectangle is 30 m.



Solution:

Given:

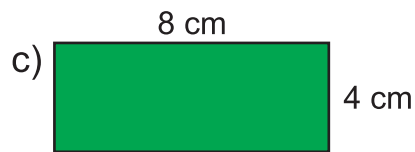
Length of the rectangle = $L = 9\text{ cm}$

Width of the rectangle = $W = 3\text{ cm}$

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (9 + 3) \\ &= 2 \times 12\text{ cm} \\ &= 24\text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 24 cm.



Solution:

Given:

Length of the rectangle = $L = 8$ cm

Width of the rectangle = $W = 4$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (8 + 4) \\ &= 2 \times 12 \text{ cm} \\ &= 24 \text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 24 cm.



Solution:

Given:

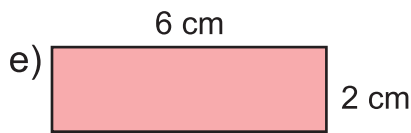
Length of the rectangle = $L = 10$ cm

Width of the rectangle = $W = 6$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (10 + 6) \\ &= 2 \times 16 \text{ cm} \\ &= 32 \text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 32 cm.



Solution:

Given:

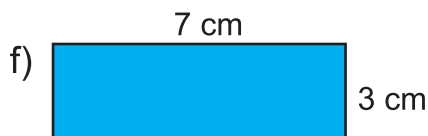
Length of the rectangle = $L = 6$ cm

Width of the rectangle = $W = 2$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (6 + 2) \\ &= 2 \times 8 \text{ cm} \\ &= 16 \text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 16 cm.



Solution:

Given:

Length of the rectangle = $L = 7$ cm

Width of the rectangle = $W = 3$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (7 + 3) \\ &= 2 \times 10 \text{ cm} \\ &= 20 \text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 20 cm.

3. Find the perimeter of the squares having the following length by using the formula.

a) 5 cm

Solution:

Given:

Length of a side = $L = 5$ cm

Using formula:

Perimeter of a square = $4 \times \text{length}$

$$= 4 \times L$$

$$= 4 \times 5 \text{ cm}$$

$$= 20 \text{ cm}$$

So the perimeter of the square is 20 cm.

b) 2.8 cm

Solution:

Given:

Length of a side = $L = 2.8$ cm

Using formula:

Perimeter of a square = $4 \times \text{length}$

$$= 4 \times L$$

$$= 4 \times 2.8 \text{ cm}$$

$$= 11.2 \text{ cm}$$

So the perimeter of the square is 11.2 cm.

c) 9.1 m

Solution:

Given:

Length of a side = $L = 9.1$ cm

Using formula:

Perimeter of a square = $4 \times \text{length}$

$$= 4 \times L$$

$$= 4 \times 9.1 \text{ cm}$$

$$= 36.4 \text{ cm}$$

So the perimeter of the square is 36.4 cm.

d) 7 cm

Solution:

Given:

Length of a side = $L = 7$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{length} \\ &= 4 \times L \\ &= 4 \times 7 \text{ cm} \\ &= 28 \text{ cm}\end{aligned}$$

So the perimeter of the square is 28 cm.

4. Find the perimeter of the rectangles having the following length and width by using the formula.

a) $L = 4$ cm , $W = 2$ cm

Solution:

Given:

Length of the rectangle = $L = 4$ cm

Width of the rectangle = $W = 2$ cm

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\ &= 2 \times (L + W) \\ &= 2 \times (4 + 2) \\ &= 2 \times 6 \text{ cm} \\ &= 12 \text{ cm}\end{aligned}$$

So the perimeter of the rectangle is 12 cm.

b) $L = 6$ m , $W = 4$ m

Solution:

Given:

Length of the rectangle = $L = 6$ m

Width of the rectangle = $W = 4$ m

Using formula:

$$\begin{aligned}
 \text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\
 &= 2 \times (L + W) \\
 &= 2 \times (6 + 4) \\
 &= 2 \times 10 \text{ m} \\
 &= 20 \text{ m}
 \end{aligned}$$

So the perimeter of the rectangle is 20 m.

c) $L = 5 \text{ m}$, $W = 3 \text{ m}$

Solution:

Given:

Length of the rectangle = $L = 5 \text{ m}$

Width of the rectangle = $W = 3 \text{ m}$

Using formula:

$$\begin{aligned}
 \text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\
 &= 2 \times (L + W) \\
 &= 2 \times (5 + 3) \\
 &= 2 \times 8 \text{ m} \\
 &= 16 \text{ m}
 \end{aligned}$$

So the perimeter of the rectangle is 16 m.

d) $L = 8 \text{ cm}$, $W = 5 \text{ cm}$

Solution:

Given:

Length of the rectangle = $L = 8 \text{ cm}$

Width of the rectangle = $W = 5 \text{ cm}$

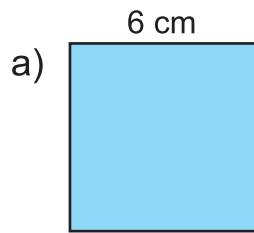
Using formula:

$$\begin{aligned}
 \text{Perimeter of a rectangle} &= 2 \times (\text{length} + \text{width}) \\
 &= 2 \times (L + W) \\
 &= 2 \times (8 + 5) \\
 &= 2 \times 13 \text{ cm} \\
 &= 26 \text{ cm}
 \end{aligned}$$

So the perimeter of the rectangle is 26 cm.

Learning Check 8.2

1. Find the area of these squares by using the formula.



Solution:

Given:

Length of a square = $L = 6 \text{ cm}$

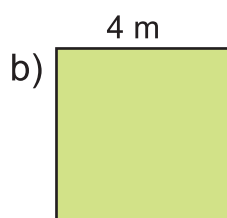
Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $6 \text{ cm} \times 6 \text{ cm}$

Area of the square = 36 cm^2 (36 square centimeters)

So area of the given square is 36 cm^2 .



Solution:

Given:

Length of a square = $L = 4 \text{ m}$

Using formula:

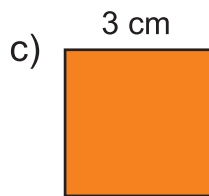
Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $4 \text{ m} \times 4 \text{ m}$

$= 16 \text{ m}^2$ (16 square meters)

So the area of the given square is 16 m^2 .



Solution:

Given:

Length of a square = $L = 3 \text{ cm}$

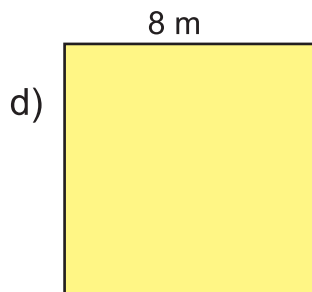
Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $3\text{cm} \times 3\text{cm}$
 $= 9 \text{ cm}^2$ (9 square centimeters)

So the area of the given square is 9 cm^2 .



Solution:

Given:

Length of a square = $L = 8 \text{ m}$

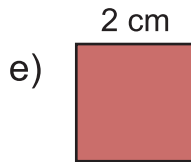
Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $8 \text{ m} \times 8 \text{ m}$
 $= 64 \text{ m}^2$ (64 square metres)

So area of the given square is 64 cm^2 .



Solution:

Given:

Length of a square = $L = 2 \text{ cm}$

Using formula:

Area of a square = length of a side $\times$ length of side

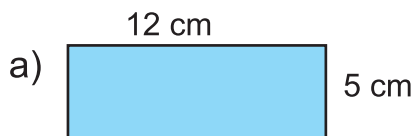
Area of a square = $L \times L$

Area of the square = $2 \text{ cm} \times 2 \text{ cm}$

$= 4 \text{ cm}^2$ (4 square centimetres)

So the area of the given square is 4 cm^2 .

2. Find the area of these rectangles by using the formula.



Solution:

Given:

Length of the rectangle = $L = 12 \text{ cm}$

Width of the rectangle = $W = 5 \text{ cm}$

Using formula:

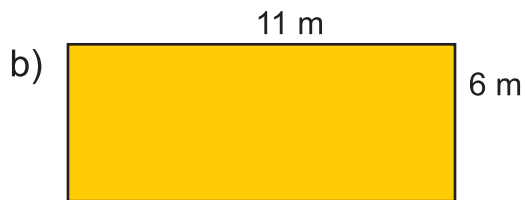
Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $12 \text{ cm} \times 5 \text{ cm}$

$= 60 \text{ cm}^2$ (60 square centimeters)

So, the area of the given rectangle is 60 cm^2 .



Solution:

Given:

Length of the rectangle = $L = 11\text{ m}$

Width of the rectangle = $W = 6\text{ m}$

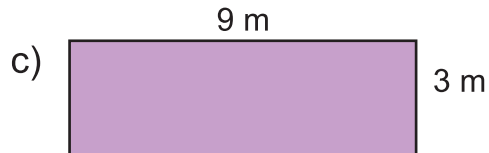
Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $11\text{ m} \times 6\text{ m}$
 $= 66\text{ m}^2$ (66 square meters)

So, the area of the given rectangle is 66 m^2 .



Solution:

Given:

Length of the rectangle = $L = 9\text{ m}$

Width of the rectangle = $W = 3\text{ m}$

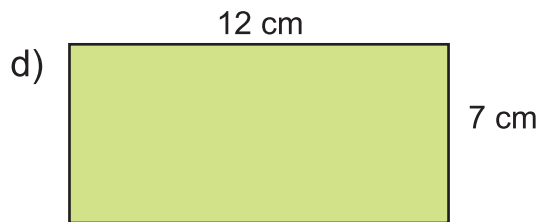
Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $9\text{ m} \times 3\text{ m}$
 $= 27\text{ m}^2$ (27 square meters)

So, the area of the given rectangle is 27 m^2 .



Solution:

Given:

Length of the rectangle = $L = 12\text{ cm}$

Width of the rectangle = $W = 7\text{ cm}$

Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $12\text{ cm} \times 7\text{ cm}$
 $= 84\text{ cm}^2$ (84 square centimeters)

So, the area of the given rectangle is 84 cm^2 .

3. Find the area of the squares having the following length by using the formula.

a) 2 cm

Solution:

Given:

Length of a square = $L = 2\text{ cm}$

Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $2\text{ cm} \times 2\text{ cm}$
 $= 4\text{ cm}^2$ (4 square centimeters)

So the area of the given square is 4 cm^2 .

b) 8 m

Solution:

Given:

Length of a square = $L = 8 \text{ m}$

Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $8 \text{ m} \times 8 \text{ m}$

$$= 64 \text{ m}^2 \text{ (64 square meters)}$$

So the area of the given square is 64 m^2 .

c) 4 cm

Solution:

Given:

Length of a square = $L = 4 \text{ cm}$

Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $4 \text{ cm} \times 4 \text{ cm}$

$$= 16 \text{ cm}^2 \text{ (16 square centimeters)}$$

So the area of the given square is 16 cm^2 .

d) 12 m

Solution:

Given:

Length of a square = $L = 12 \text{ m}$

Using formula:

Area of a square = length of a side $\times$ length of side

Area of a square = $L \times L$

Area of the square = $12 \text{ m} \times 12 \text{ m}$

$= 144 \text{ m}^2$ (144 square meters)

So the area of the given square is 144 m^2 .

4. Find the area of the rectangles having the following length and width by using the formula.

a) $L = 5 \text{ cm}$, $W = 1 \text{ cm}$

Solution:

Given:

Length of the rectangle = $L = 5 \text{ cm}$

Width of the rectangle = $W = 1 \text{ cm}$

Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $5 \text{ cm} \times 1 \text{ cm}$

$= 5 \text{ cm}^2$ (5 square centimeters)

So, the area of the given rectangle is 5 cm^2 .

b) $L = 9 \text{ m}$, $W = 2 \text{ m}$

Solution:

Given:

Length of the rectangle = $L = 9 \text{ m}$

Width of the rectangle = $W = 2 \text{ m}$

Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $9 \text{ m} \times 2 \text{ m}$

$$= 18 \text{ m}^2 \text{ (18 square meters)}$$

So, the area of the given rectangle is 18 m^2 .

c) $L = 7 \text{ m}$, $W = 4 \text{ m}$

Solution:

Given:

Length of the rectangle = $L = 7 \text{ m}$

Width of the rectangle = $W = 4 \text{ m}$

Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $7 \text{ m} \times 4 \text{ m}$

$$= 28 \text{ m}^2 \text{ (28 square meters)}$$

So, the area of the given rectangle is 28 m^2 .

d) $L = 11 \text{ cm}$, $W = 6 \text{ cm}$

Solution:

Given:

Length of the rectangle = $L = 11 \text{ cm}$

Width of the rectangle = $W = 6 \text{ cm}$

Using formula:

Area of a rectangle = (length $\times$ width)

Area of a rectangle = $(L \times W)$

Area of a rectangle = $11 \text{ cm} \times 6 \text{ cm}$

$$= 66 \text{ cm}^2 \text{ (66 square centimeters)}$$

So, the area of the given rectangle is 66 cm^2 .

Learning Check 8.3

1. The length of a square-shaped hall is 28 meters. Find the perimeter and area of the hall.

Solution:

Given:

Length of the hall = $L = 28$ m

Perimeter of the hall = $4 \times$ length of a side

$$= 4 \times 28$$

$$= 112 \text{ m}$$

Area of square shaped hall = Length $\times$ Length of side

$$= L \times L$$

$$= 28 \text{ m} \times 28 \text{ m}$$

$$= 784 \text{ m}^2$$

So, the perimeter of the hall is 112 m and the area of the hall is 784 m^2 .

2. The perimeter of a square-shaped room is 40 meters. What is the length of each side of the room? Also find its area.

Solution:

Given:

Perimeter of the square shaped room = 40 meters

Length of each side of room = ?

Area of the room = ?

Using formula:

Perimeter of a square = $4 \times$ length of a side

$$40 \text{ m} = 4 \times L$$

dividing both sides by 4

$$\frac{40}{4} = \frac{4 \times L}{4}$$

$$10 \text{ m} = L$$

$$\text{or } L = 10 \text{ m}$$

So, the length of each side of the room is 10 m to find area, we use the formula.

$$\begin{aligned}\text{Area of the square = shaped room} &= \text{Length side of} \times \text{Length of side} \\ &= L \times L \\ &= 10 \text{ m} \times 10 \text{ m} \\ &= 100 \text{ m}^2\end{aligned}$$

So, the area of the room is 100 m^2 .

3. The perimeter of a rectangular ground is 32 meters. What is the length of the ground if its width is 6 m?

Solution:

Given:

Perimeter of a rectangular ground = 32 m

Width of the ground = $W = 6 \text{ m}$

Length of the ground = $L = ?$

Using formula:

Perimeter of a rectangular shaped area = $4 \times (\text{length} + \text{width})$

Perimeter of a rectangular shaped area = $2 \times (L + W)$

$$32 \text{ m} = 2 \times (L + W)$$

dividing both sides by 2

$$\frac{32\text{m}}{2} = \frac{\cancel{2} \times (L + 6\text{m})}{\cancel{2}}$$

$$16 \text{ m} = L + 6 \text{ m}$$

$$\text{or } L = 16 \text{ m} - 6 \text{ m}$$

$$L = 10 \text{ m}$$

So, the length of the ground is 10 m.

4. The length of a rectangular masjid is 40 meters and its width is 22 meters. What is the cost of tiling the masjid if the rate of tiling is Rs 630 per square meter?

Solution:

Given:

Length of rectangular masjid = $L = 40\text{ m}$

Width of rectangular masjid = $W = 22\text{ m}$

Rate of tiling per square meter = Rs 630

Cost of tiling the masjid = ?

To find the cost of tiling the masjid we have to find its area (as tiles cover all the area in a given place)

Using formula:

Area of rectangular masjid = Length $\times$ Width

$$\begin{aligned}\text{Area of rectangular masjid} &= (L \times W) \\ &= 40\text{ m} \times 22\text{ m} \\ &= 880\text{ m}^2\end{aligned}$$

Now:

Cost of tiling per square meter area = Rs. 630

Cost of tiling 880 square meter area = $\text{Rs. } 630 \times 880 = \text{Rs } 554,400$

So, the cost of tiling the masjid is Rs. 554,400.

5. The length of a square-shaped field is 21 meters.

a)

Cost of fencing around the field = ?

Cost of fencing per meter = Rs. 280

To find the cost of fencing, we need to find

the perimeter of the field (fencing is done on the border (perimeter) of a place)

Using formula:

$$\begin{aligned}\text{Perimeter of square} &= 4 \times \text{Length of a side} \\ &= 4 \times L \\ &= 4 \times 21\text{ m} \\ &= 84\text{ m}\end{aligned}$$

Now,

Rate of fencing = Rs. 280 per meter

Cost of fencing 84 m = Rs. 280×84 m
= Rs. 23,520

b)

Cost of cementing per square meter = Rs. 325

Cost of cementing the square field = ?

To find the cost of cementing we need to find

the area of the square field (cementing covers all the area of the given place)

Using formula:

Area of square = Length of side $\times$ length of side
= $L \times L$
= $21 \text{ m} \times 21 \text{ m}$
= 441 m^2

Now,

Cost of cementing per square meter = Rs 325

Cost of fencing 84 m = Rs 325×441 = Rs 143,325

So, the cost of fencing the field is Rs 23,520 and the cost of cementing the field is Rs 143,325.

Unit Check 8

1. Encircle the correct options.

a) (ii) sum b) (iiii) area c) (iii) perimeter d) (iv) area e) (ii) $L \times W$

2. Differentiate between the area and perimeter of a shape.

Answer:

Differentiate between the area and perimeter of a shape.

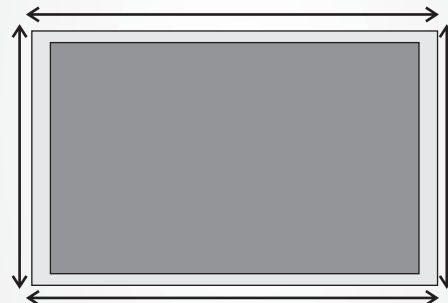
Area	Perimeter
Area is the space occupied by the surface of any 2-D shape.	The sum of all the sides of a closed shape is called its perimeter.

- Area is always measured in squared units (square centimeters cm^2 , square meters m^2 , etc.).
- We often find the area of the floor of a room to find the size of the carpet.



- The space occupied by this rectangle is its area.

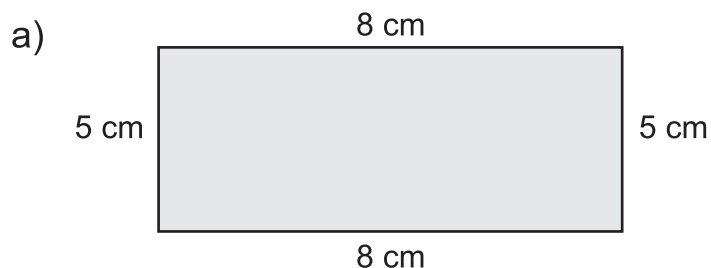
- Perimeter is always measured in single units (centimeters cm , meters m , etc.).
- We often find the perimeter when fencing around the garden.



Perimeter

- The total length of the boundary of this rectangle is its perimeter.

3. Find the perimeter and area of these shapes by using the formula.



Solution:

Given:

Length of the rectangle = $L = 8 \text{ cm}$

Width of the rectangle = $W = 5 \text{ cm}$

For Perimeter:

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{Length} + \text{Width}) \\ &= 2 \times (L + W) \\ &= 2 \times (8 \text{ cm} + 5 \text{ cm}) \\ &= 2 \times 13 \text{ cm} \\ &= 26 \text{ cm}\end{aligned}$$

For Area:

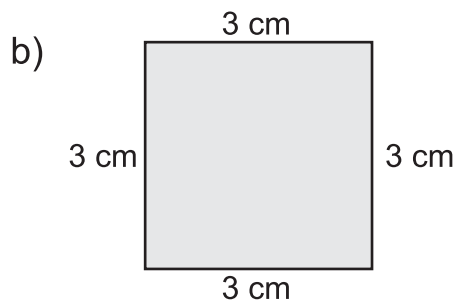
Using formula:

$$\text{Area of a rectangle} = \text{Length} \times \text{Width}$$

$$\text{Area of a rectangle} = L \times W$$

$$\begin{aligned}\text{Area of a rectangle} &= 8 \text{ cm} \times 5 \text{ cm} \\ &= 40 \text{ cm}^2 \text{ (40 square centimeter)}\end{aligned}$$

So, the perimeter of the rectangle is 26 cm and the area of the rectangle is 40 cm^2 .

**Solution:****Given:**

$$\text{Length of a side} = L = 3 \text{ cm}$$

For Perimeter:

Using formula:

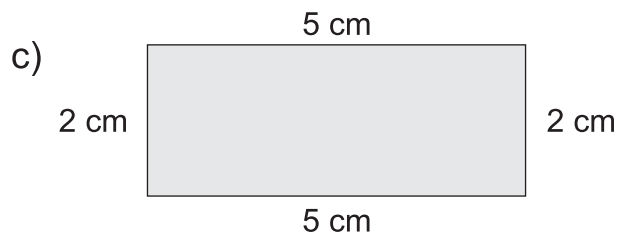
$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{Length of a side} \\ &= 4 \times L \\ &= 4 \times 3 \text{ cm} \\ &= 12 \text{ cm}\end{aligned}$$

For Area:

Using formula:

$$\begin{aligned}\text{Area of a square} &= \text{Length of side} \times \text{Length of side} \\ &= L \times L \\ &= 3 \text{ cm} \times 3 \text{ cm} \\ &= 9 \text{ cm}^2\end{aligned}$$

So, the perimeter of the given square is 12 cm and the area of the given square is 9 cm^2 .

**Solution:****Given:**

Length of the rectangle = $L = 5 \text{ cm}$

Width of the rectangle = $W = 2 \text{ cm}$

For Perimeter:

Using formula:

$$\begin{aligned}\text{Perimeter of a rectangle} &= 2 \times (\text{Length} + \text{Width}) \\ &= 2 \times (L + W) \\ &= 2 \times (5 \text{ cm} + 2 \text{ cm}) \\ &= 2 \times 7 \text{ cm} = 14 \text{ cm}\end{aligned}$$

For Area:

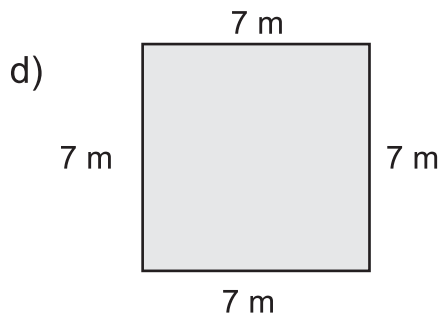
Using formula:

Area of a rectangle = Length $\times$ Width

Area of a rectangle = $L \times W$

$$\begin{aligned}\text{Area of a rectangle} &= 5 \text{ cm} \times 2 \text{ cm} \\ &= 10 \text{ cm}^2 \text{ (10 square centimeter)}\end{aligned}$$

So, the perimeter of the given rectangle is 14 cm and the area of the given rectangle is 10 cm^2 .



Solution:

Given:

Length of a side = $L = 7 \text{ m}$

For Perimeter:

Using formula:

$$\begin{aligned}\text{Perimeter of a square} &= 4 \times \text{Length of a side} \\ &= 4 \times L \\ &= 4 \times 7 \text{ m} \\ &= 28 \text{ m}\end{aligned}$$

For Area:

Using formula:

$$\begin{aligned}\text{Area of a square} &= \text{Length of side} \times \text{Length of side} \\ &= L \times L \\ &= 7 \text{ m} \times 7 \text{ m} \\ &= 49 \text{ m}^2\end{aligned}$$

So, the perimeter of the given square is 28 m and the area of the given square is 49 m^2 .

4. A rectangular-shaped shop is 18 m long and 12 m wide.

Find the perimeter and area of the shop.

Solution:

Given:

Length of the rectangle = $L = 18 \text{ cm}$

Width of the rectangle = $W = 12 \text{ cm}$

For Perimeter:

Using formula:

$$\begin{aligned}
 \text{Perimeter of a rectangle} &= 2 \times (\text{Length} + \text{Width}) \\
 &= 2 \times (L + W) \\
 &= 2 \times (18 \text{ m} + 12 \text{ m}) \\
 &= 2 \times 30 \text{ m} = 60 \text{ m}
 \end{aligned}$$

For Area:

Using formula:

$$\text{Area of a rectangle} = \text{Length} \times \text{Width}$$

$$\text{Area of a rectangle} = L \times W$$

$$\begin{aligned}
 \text{Area of a rectangle} &= 18 \text{ m} \times 12 \text{ m} \\
 &= 216 \text{ m}^2
 \end{aligned}$$

So, the perimeter of the shop is 60 m and the area of the shop is 216 m².

5. The perimeter of a square-shaped farm is 92 m. Find the area of the farm.

Solution:**Given:**

$$\text{Perimeter of a square-shaped farm} = 92 \text{ m}$$

$$\text{Area of farm} = ?$$

(To find the area of square-shaped farm, we first need to find the length of a side of the square shaped farm)

Using formula:

$$\text{Perimeter of a square-shaped farm} = 4 \times \text{Length of farm}$$

$$92 \text{ m} = 4 \times L$$

$$\begin{array}{rcl}
 \overset{23}{\cancel{92} \text{ m}} & = & \overset{1}{\cancel{4}} \times L \\
 \hline
 \cancel{1} \cancel{4} & = & \cancel{4}_1
 \end{array}$$

dividing both sides by 4

$$23 \text{ m} = L$$

$$\text{or} \quad L = 23 \text{ m}$$

Now, using the formula for the area.

$$\begin{aligned}
 \text{Area of a square} &= \text{Length of side} \times \text{Length of side} \\
 &= L \times L \\
 &= 23 \text{ m} \times 23 \text{ m} \\
 &= 529 \text{ m}^2
 \end{aligned}$$

So, the area of the square-shaped farm is 529 m^2 .

6. The length of a garden is 13 m and its width is 10 m.

- a) What will be the cost of planting grass in the garden at the rate of Rs 110 per meter square?
- b) What will be the cost of fencing the garden if the rate of fencing is Rs 215 per meter?

Solution:

Given:

Length of the rectangle = $L = 13 \text{ m}$

Width of the rectangle = $W = 10 \text{ m}$

a)

Rate of planting grass = Rs 110 per meter square

Cost of planting grass in the rectangle-garden = ?

(Here we find the area of the garden, as the planted grass will cover the entire area of the garden)

Using formula:

Area of a rectangle = Length $\times$ Width

Area of a rectangle = $L \times W$

Area of a rectangular garden = $13 \text{ m} \times 10 \text{ m}$

$$= 130 \text{ m}^2$$

Now,

Cost of planting grass per m^2 area = Rs 110

Cost of planting grass 130 m^2 area = $\text{Rs } 110 \times 130$

$$= \text{Rs } 14,300$$

So, the cost of planting grass in the garden is Rs 14,300.

b)

Rate of fencing the garden = Rs 215 per meter square

Cost of fencing the garden = ?

(To find the cost of fencing, we find the perimeter of the rectangular garden first, as the fence covers the perimeter of the garden)

Using formula:

Perimeter of a rectangle = $2 \times (\text{Length} + \text{Width})$

$$= 2 \times (L + W)$$

Perimeter of a rectangular garden = $2 \times (13 \text{ m} + 10 \text{ m})$

$$= 2 \times 23 \text{ m} = 46 \text{ m}$$

Now,

Cost of fencing per meter = Rs 215

Cost of fencing 46 meter = $\text{Rs } 215 \times 46$

$$= \text{Rs } 9890$$

So, the cost of fencing the garden is Rs 9890.

Unit 9: Data Handling

Learning Check 9.1

1. Find the average of the following.

a) 12, 13, 14, 16, 21

Solution:

$$\text{Average} = \frac{\text{Sum of quantities}}{\text{number of quantities}}$$

$$\text{Arerage} = \frac{12+13+14+16+21}{5}$$

$$= \frac{76}{5}$$

$$= 15.2 \text{ Answer}$$

b) 21, 35, 45, 56, 62

Solution:

$$\text{Average} = \frac{\text{Sum of quantities}}{\text{number of quantities}}$$

$$\text{Arerage} = \frac{21+35+45+56+62}{5}$$

$$= \frac{219}{5}$$

$$= 43.8 \text{ Answer}$$

c) 23.6 m, 26.5 m, 28.9 m, 30.1 m, 36.2 m

Solution:

$$\text{Average} = \frac{\text{Sum of quantities}}{\text{number of quantities}}$$

$$\text{Arerage} = \frac{23.6 \text{ m}+26.5 \text{ m}+28.9 \text{ m}+30.1 \text{ m}+36.2 \text{ m}}{5}$$

$$= \frac{145.3\text{m}}{5} = 29.06 \text{ Answer}$$

d) 33 g, 34 g, 35 g, 36 g, 38 g

Solution:

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ \text{Average} &= \frac{33 \text{ g}, 34 \text{ g}, 35 \text{ g}, 36 \text{ g}, 38 \text{ g}}{5} \\ &= \frac{176}{5} \\ &= 35.2 \text{ Answer}\end{aligned}$$

e) 4 ml, 7 ml, 5 ml, 9 ml, 12 ml, 5 ml

Solution:

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ \text{Average} &= \frac{4 \text{ ml}, 7 \text{ ml}, 5 \text{ ml}, 9 \text{ ml}, 12 \text{ ml}, 5 \text{ ml}}{6} \\ &= \frac{42 \text{ ml}}{6} \\ &= 7 \text{ Answer}\end{aligned}$$

2. Find the average of:

a) first five 2-digit numbers

Solution:

First five 2-digit numbers are:

10, 11, 12, 13, 14

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ &= \frac{10+11+12+13+14}{5} \\ &= \frac{60}{5} = 12 \text{ Answer}\end{aligned}$$

b) first three composite numbers

Solution:

First 3 composite numbers:

4, 6, 8

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ &= \frac{4+6+8}{3} \\ &= \frac{18}{3} \\ &= 6 \quad \text{Answer}\end{aligned}$$

c) factors of 10

Solution:

Factors of 10:

1, 2, 5, 10

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ &= \frac{1+2+5+10}{4} \\ &= \frac{18}{4} = 4.5 \quad \text{Answer}\end{aligned}$$

d) first 6 multiples of 4

Solution:

First 6 multiples of 4:

4, 8, 12, 16, 20, 24

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ &= \frac{4+8+12+16+20+24}{6}\end{aligned}$$

$$= \frac{84}{6}$$

$$= 14 \text{ Answer}$$

3. Complete the table.

Average	Number of quantities	Sum of quantities
a) 23.5	5	117.5
b) 39 kg	6	234 kg
c) 84	8	672
d) 60 m	7	420 m
e) 40	9	360

Solution:

a) Average = 23.5

Number of quantities = 5

Sum of quantities = ?

Using formula:

$$\begin{aligned} \text{Sum of quantities} &= \text{Average} \times \text{number of quantities} \\ &= 23.5 \times 5 \\ &= 117.5 \end{aligned}$$

Solution:

b) Number of quantities = 6

Sum of quantities = 234 kg

Average = ?

Using formula:

$$\text{Average} = \frac{\text{Sum of quantities}}{\text{number of quantities}}$$

$$\begin{aligned} \text{Average} &= \frac{234 \text{ kg}}{6} \\ &= 39 \text{ kg} \end{aligned}$$

Solution:

$$\begin{aligned}\text{c) Average} &= 84 \\ \text{Number of quantities} &= 8 \\ \text{Sum of quantities} &= ?\end{aligned}$$

Using formula:

$$\begin{aligned}\text{Sum of quantities} &= \text{Average} \times \text{number of quantities} \\ &= 84 \times 8 \\ &= 872\end{aligned}$$

Solution:

$$\begin{aligned}\text{d) Average} &= 60 \text{ m} \\ \text{Number of quantities} &= ? \\ \text{sum of quantities} &= 420 \text{ m}\end{aligned}$$

Using formula:

$$\begin{aligned}\text{Number of quantities} &= \frac{\text{Sum of quantities}}{\text{Average}} \\ \\ \text{Average} &= \frac{420}{660} \\ &= 7 \text{ m}\end{aligned}$$

Solution:

$$\begin{aligned}\text{e) Average} &= ? \\ \text{Number of quantities} &= 9 \\ \text{sum of quantities} &= 360\end{aligned}$$

Using formula:

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of quantities}}{\text{number of quantities}} \\ \\ \text{Average} &= \frac{360}{9} \\ &= 40\end{aligned}$$

Learning Check 9.2

1. Pakistan scored 220, 225, 234 and 324 runs respectively in 4 innings of cricket matches. What was the average score of Pakistan in these 4 innings?

Solution:

Given:

Number of innings = 4

Sum of runs = 220+225+234+324

Using formula:

$$\begin{aligned}\text{Average score} &= \frac{\text{Sum of runs scored}}{\text{number of innings}} \\ &= \frac{1003}{4} = 250.75\end{aligned}$$

So, the average score of Pakistan in 4 innings was 250.75

2. The average capacity of 5 water tanks is 16.8 liters. Find their total capacity altogether.

Solution:

Given:

Number of tanks = 5

Average capacity of 5 tanks = 16.8 litres

Total capacities of tanks altogether = ?

(To find total capacity of all the tanks we have
to find the sum of their capacities)

Using formula:

$$\begin{aligned}\text{Total capacity of tanks} &= \text{Average capacity} \times \text{Number of tanks} \\ &= 16.8 \text{ liters} \times 5 \text{ of tanks} \\ &= 84 \text{ liters}\end{aligned}$$

So, the total capacity of tanks altogether is 84 liters.

3. Ali spent Rs 6700 in 8 days. Find the average amount he spent each day.

Solution:

Given:

Number of days = 8

Total amount spent by Ali = Rs. 6700

Average amount spent = ?

Using formula:

$$\begin{aligned}\text{Average amount spent} &= \frac{\text{Total amount spent}}{\text{number of days}} \\ &= \frac{\text{Rs. 6700}}{8} = 837.5\end{aligned}$$

So, the average amount spent by Ali on each day is RS. 837.5

4. The following table shows the number of admissions in Hifz class during the first 6 months of the year. Find the average number of admissions during 6 months.

Solution:

Given:

Number of months = 6

Sum of (total) number of admissions = Rs. 67+90+122+87+100+104

A = 570

Average amount of admissions = ?

Using formula:

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of values}}{\text{number of values}} \\ &= \frac{570}{6} \\ &= 95\end{aligned}$$

So, the average number of admissions during the first 6 months is 95.

**5. The following table shows the amount saved by Arham in 6 weeks.
Find the average amount he saved.**

Solution:

Given:

Number of weeks = 6

Total amount saved by Arham = $\frac{\text{Sum of amounts saved in 6 weeks}}{6}$
= $656+446+500+500+790+672$
= Rs. 3564

Average amount of admissions = ?

Using formula:

Average = $\frac{\text{Sum of values}}{\text{number of values}}$
= $\frac{\text{Rs. 3564}}{6}$
= Rs. 594

So, the average amount saved by arham is Rs. 594

Learning Check 9.3

1. The following data shows the number of different fruit trees in a farm.
Draw a vertical bar graph for this data using a suitable scale.

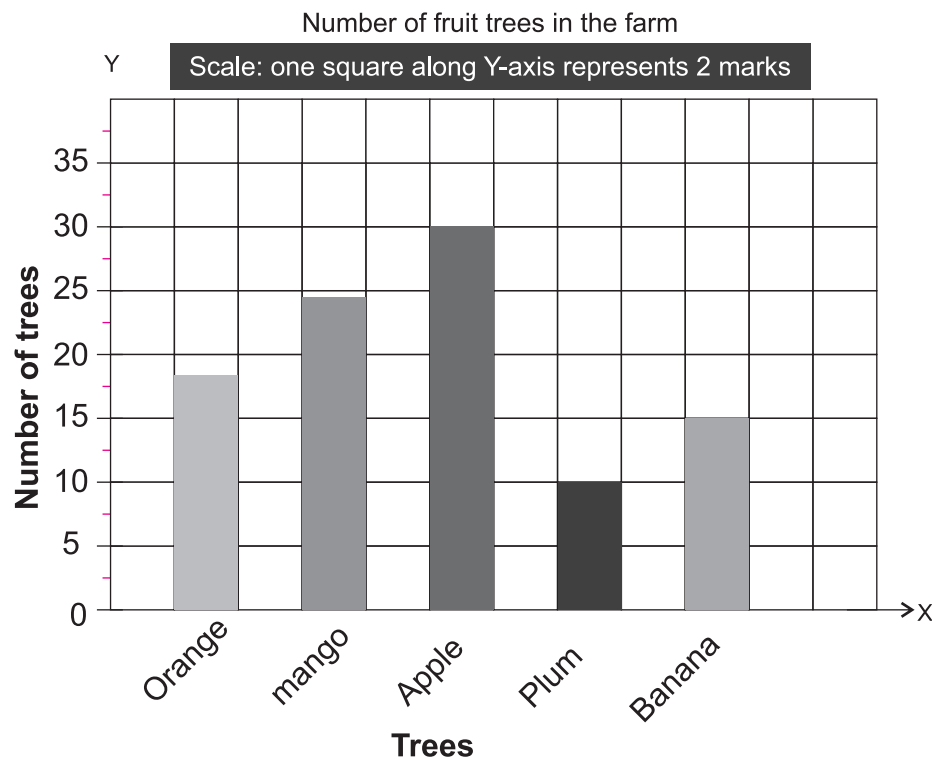
Trees	Orange	Mango	Apple	Plum	Banana
Number of Trees	18	24	30	10	15

Step I: Draw the x-axis and y-axis

Step II: Write the names of fruits along the x-axis and the number of trees of each fruit along y-axis on the graph.

Step III: Select a suitable scale. Here 1 square along the y-axis represent 2 trees.

Step IV: Colour the squares according the data values. These are 18 orange trees, so we colour the squares up to 18, similarly we do the same for all other trees.



2. The following data shows the favourite snacks of grade 5 students.
Draw a horizontal bar graph for this data using a suitable scale.

Snacks	Biscuit	Burger	Sandwich	Chips	Pizza
Number of Children	8	4	12	16	18

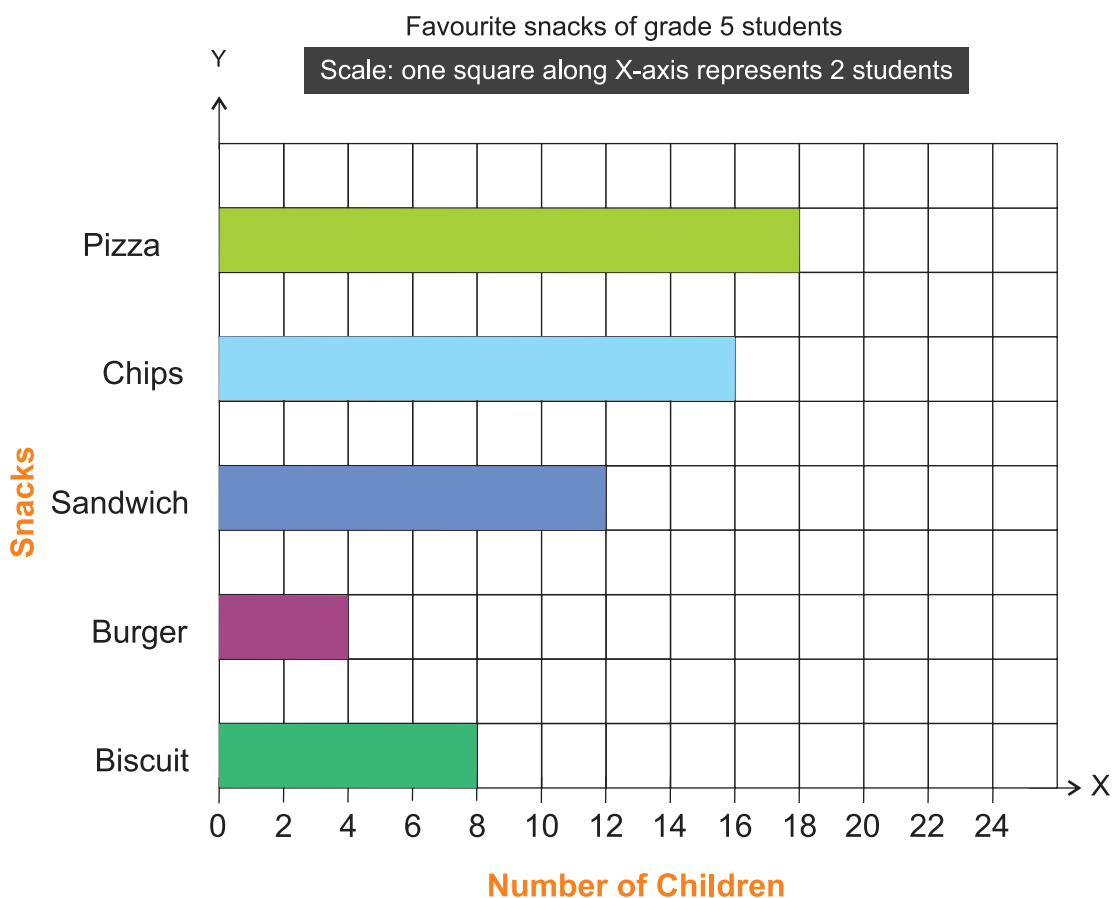
Step I: Draw the x-axis and y -axis

Step II: Write the names of snacks on y-axis and number of children on x-axis. Also name the graph.

Step III: Select a suitable scale according to the data. Here 1 square along the x-axis represents 2 children.

Step IV: Colour the squares according to the data values.

The favourite snack of 8 children is biscuit. So colour four square. Similarly colour the squares according to the given data.



3. The following data shows the flowers in a garden. Draw a vertical bar graph for this data using a suitable scale.

Flowers	Rose	Jasmine	Tulip	Lily	Daffodil
Number of Flowers	50	25	10	18	12

Step I: Draw the x-axis and y -axis

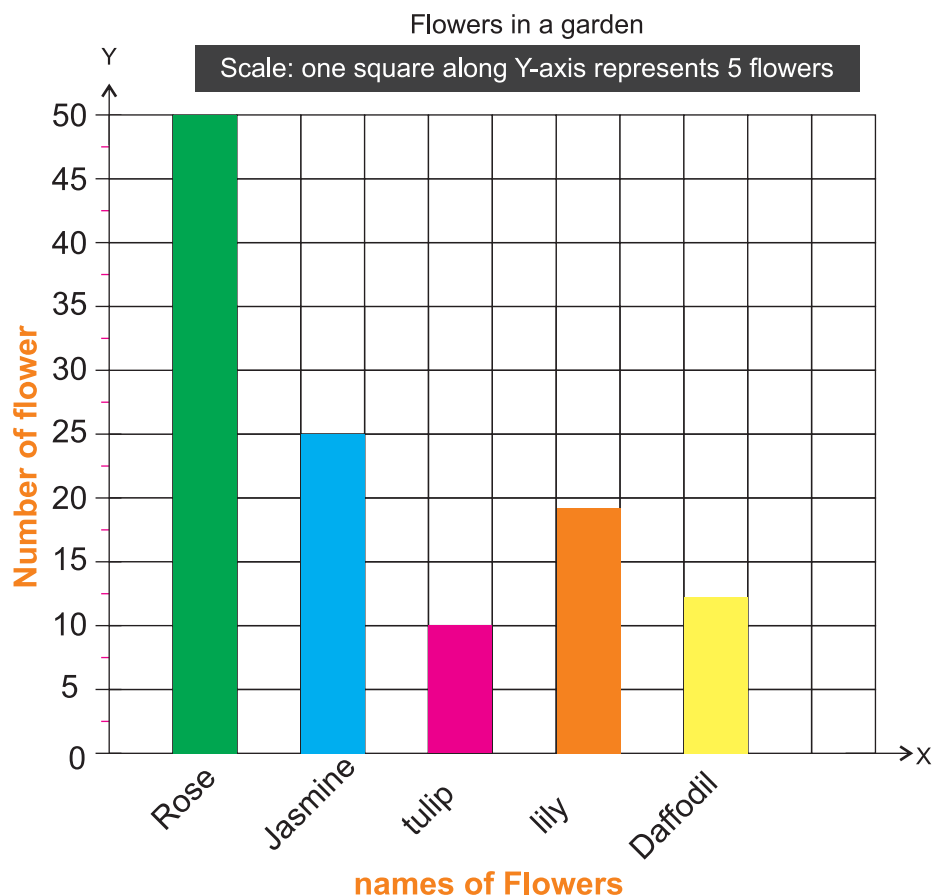
Step II: Write the names of flowers on y-axis and number of flowers on x-axis. Name the graph.

Step III: Select a suitable scale according to the given data. Here 1 square along y-axis represents 5 flowers.

Step IV: Colour the squares according to the data values.

There are 50 Rose. Flowers. So we colour ten squares along y-axis.

Similarly, colour the correct number of squares for all the subjects.



4. The following data shows the number of vocabulary words learnt by Ahad in 5 weeks. Draw a horizontal bar graph for this data using a suitable scale.

Weeks	Week 1	Week 2	Week 3	Week 4	Week 5
Number of Words	18	32	24	20	28

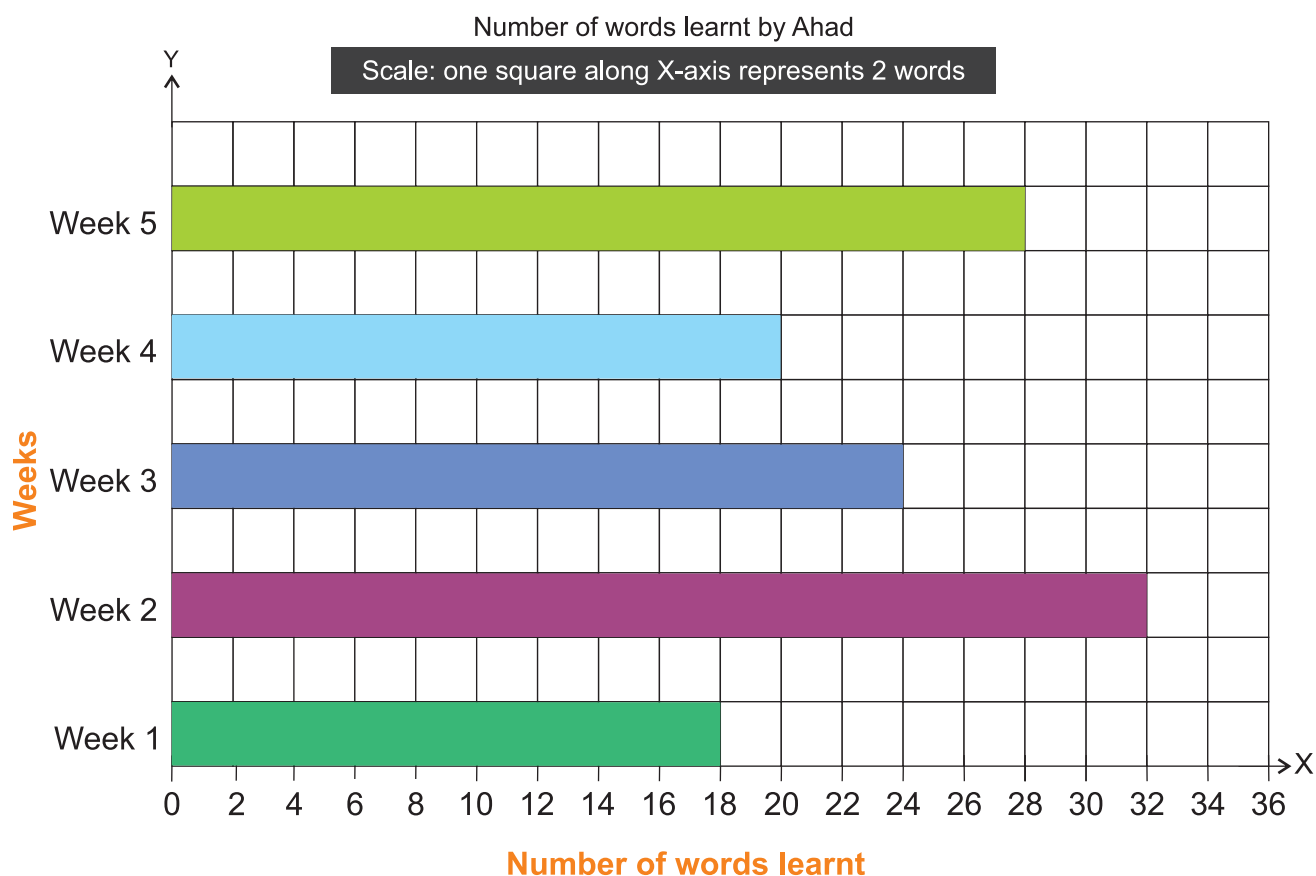
Step I: Draw the x-axis and y-axis

Step II: Write the names of words on x-axis and the names of weeks on y-axis. Also name the graph.

Step III: Select the scale according to the given data. Here 1 square along the x-axis represents 2 words.

Step IV: Colour the squares according to the data values.

As Ahad learnt 18 words in week 1 so colour nine squares. Similarly, colour the squares according to the given data values.



3. The following data shows the number of grade 5 students who took Hifz-e-Quran classes over a period of 5 years. Draw a vertical bar graph for this data using a suitable scale.

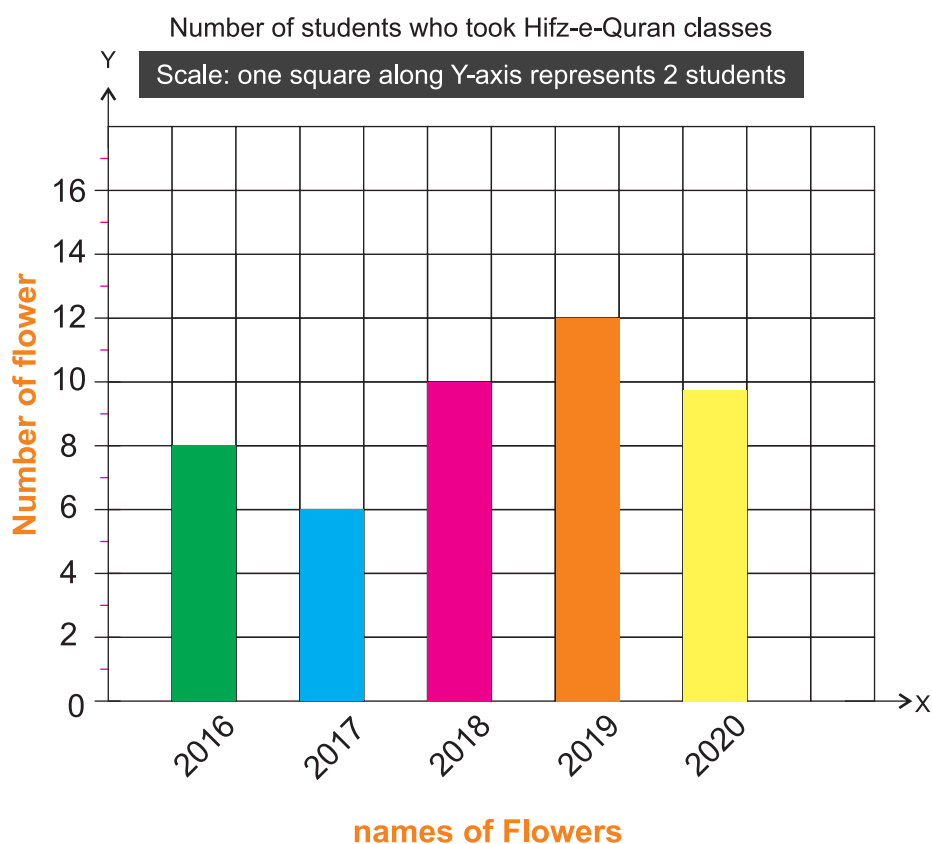
Years	2016	2017	2018	2019	2020
Number of Students	8	6	10	12	9

Step I: Draw the x-axis and y-axis

Step II: Write the names of students along y-axis and year along x-axis.
Also name the graph.

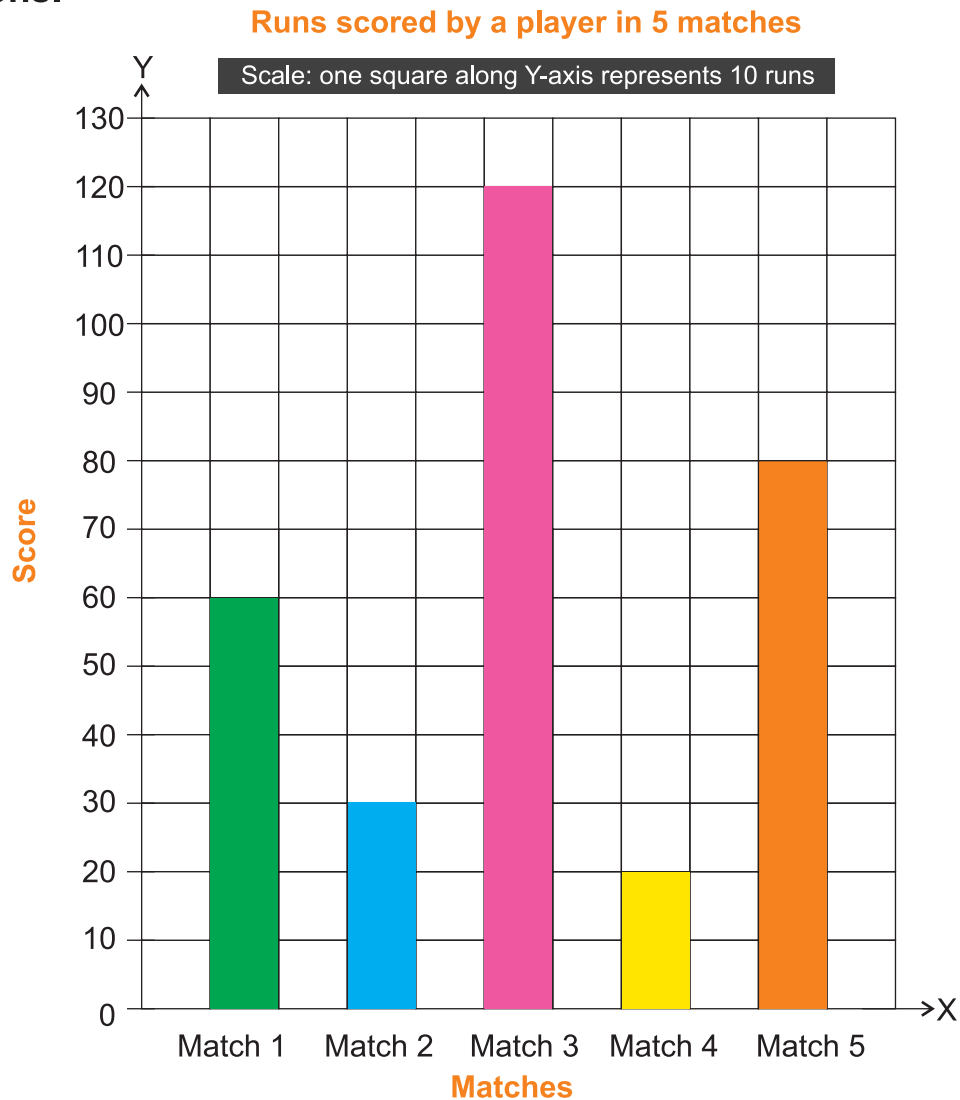
Step III: Select a scale according to the given data. Here 1 square along the y-axis represents 2 students.

Step IV: Colour the squares according to the data values. Here 8 students took Hifz-e-Quran classes in the year 2016, So we colour four squares. Similarly colour the correct number of squares for all data values.



Learning Check 9.4

1. The following bar graph represents the runs scored by a player during 5 matches. Read and interpret the bar graph. Then answer the questions.



- a) How many runs did he score in match 3?

Solution:

Answer: 120 runs

He scored 120 runs in match 3.

- b) How many more runs did he score in match 1 than match 2?

Solution:

Answer: 30

Runs scored in match 1 = 60

Runs scored in match 2 = 30

Difference = $60 - 30 = 30$

So, he scored 30 more runs in match 1, than in match 2.

c) In which match did he score the least runs?

Solution:

Answer: Match 4

He scored the least runs in match 4, i.e. 20 runs.

d) In which match did he score the most runs?

Solution:

Answer: Match 3

He scored the most runs in match 3, i.e. 120 runs.

e) How many more runs did he score in match 1 than match 2?

Solution:

Answer: 310

Runs scored in match 1 = 60

Runs scored in match 2 = 30

Runs scored in match 3 = 120

Runs scored in match 4 = 20

Runs scored in match 5 = 80

Total scored in 5 matches altogether = $60+30+120+20+80$
= 310

So, he scored 310 runs in matches altogether.

f) How many fewer runs did he score in match 5 than match 3?

Solution:

Answer: 40

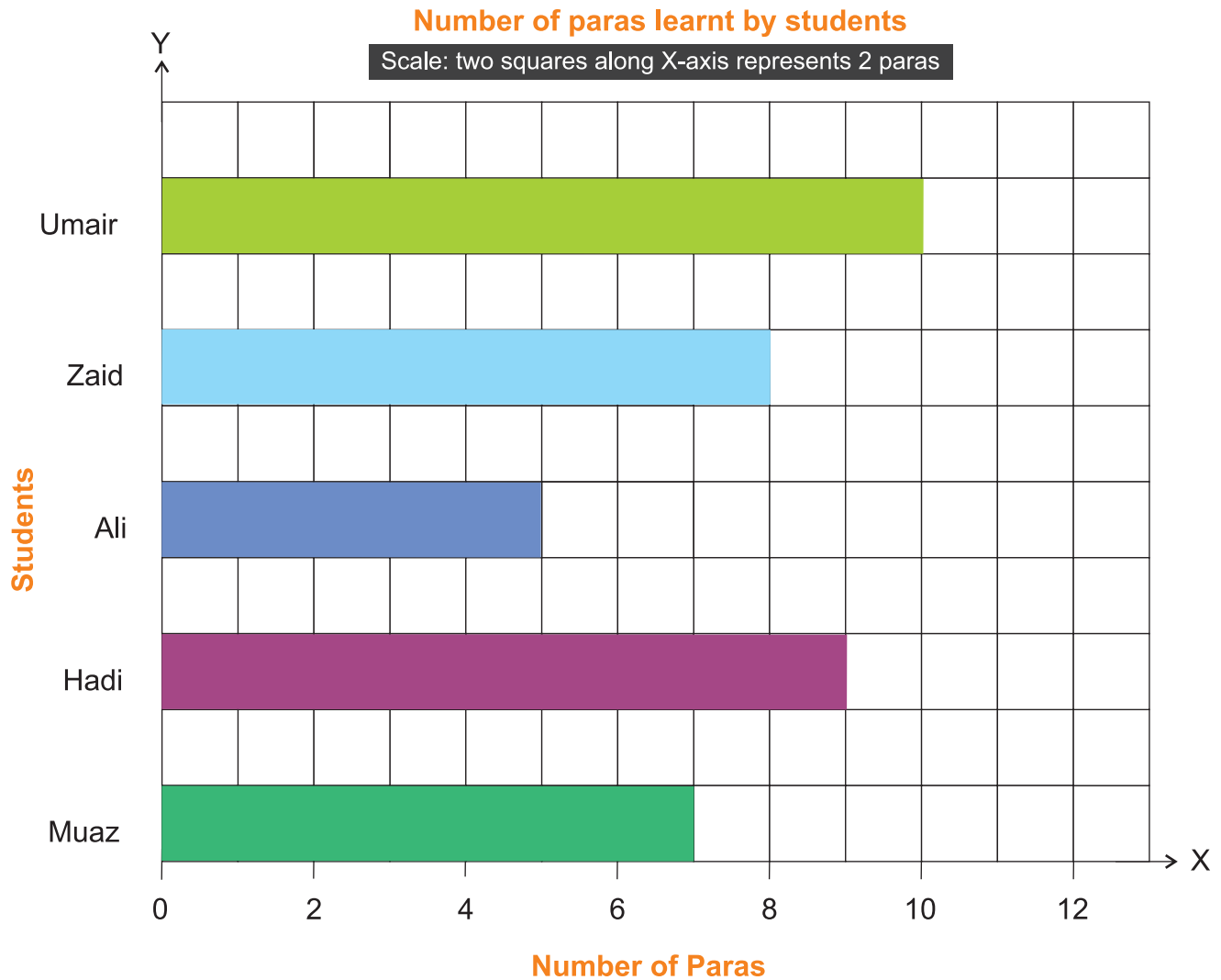
Runs scored in match 3 = 120

Runs scored in match 5 = 80

Difference = $120 - 80 = 40$

So, he scored 40 runs fewer in match 5, than in match 3.

2. The following graph shows the number of students who learnt (Hifz) different paras of the Holy Quran during 4 months.



a) Which student learnt the greatest number of paras?

Solution:

Answer: Umair

Umair learnt 10 paras

b) Which student learnt 8 paras?

Solution:

Answer: Zaid

Zaid learnt 8 paras, as 8 squares are coloured.

c) How many less paras were learnt by Ali than Muaz?

Solution:

Answer: 2

Paras learnt by Muaz = 7

Paras learnt by ali = 5

Difference in numbers of paras learnt = $7 - 5 = 2$

So 2 fewer paras were learnt by Ali than Muaz.

d) How many paras were learnt by Hadi?

Solution:

Answer: 9

As 9 squares are coloured so 9 paras were learnt by Hadi.

e) How many more paras were learnt by Umair than Zaid?

Solution:

Answer: 2

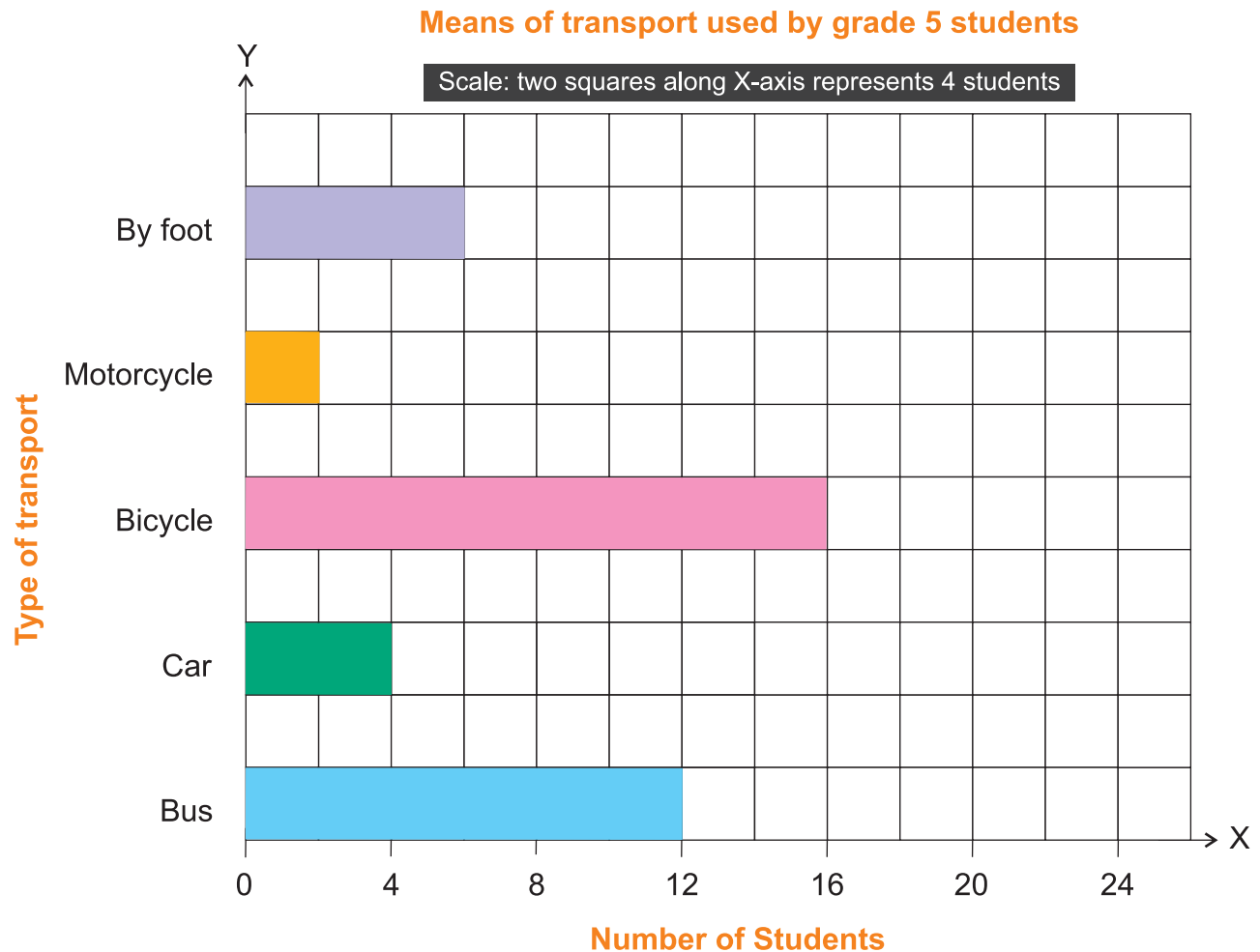
Paras learnt by Umair = 10

Paras learnt by Zaid = 8

Difference = $10 - 8 = 2$

So 2 more paras were learnt by Umair than Zaid.

3. The following bar graph shows the means of transport used by grade 5 students to come to school.



a) How many students use a car to come to school?

Solution:

Answer: 4

4 students use a car to come to school.

b) How many more students use a bicycle than a motorcycle?

Solution:

Answer: 14

Number of students who use a bicycle = 16

Number of students who use a motorcycle = 2

Difference = $16 - 2 = 14$

14 more students use a bicycle than motorcycle.

c) How many students use a bus?

Solution:

Answer: 12

As 6 squares are coloured, so it means 12 students use a bus.

d) Which means of transport is used by the least number of students?

Solution:

Answer: Motorcycle

Only 2 students use motorcycle.

e) Which means of transport is used by the most number of students?

Solution:

Answer: Bicycle

16 students use a bicycle.

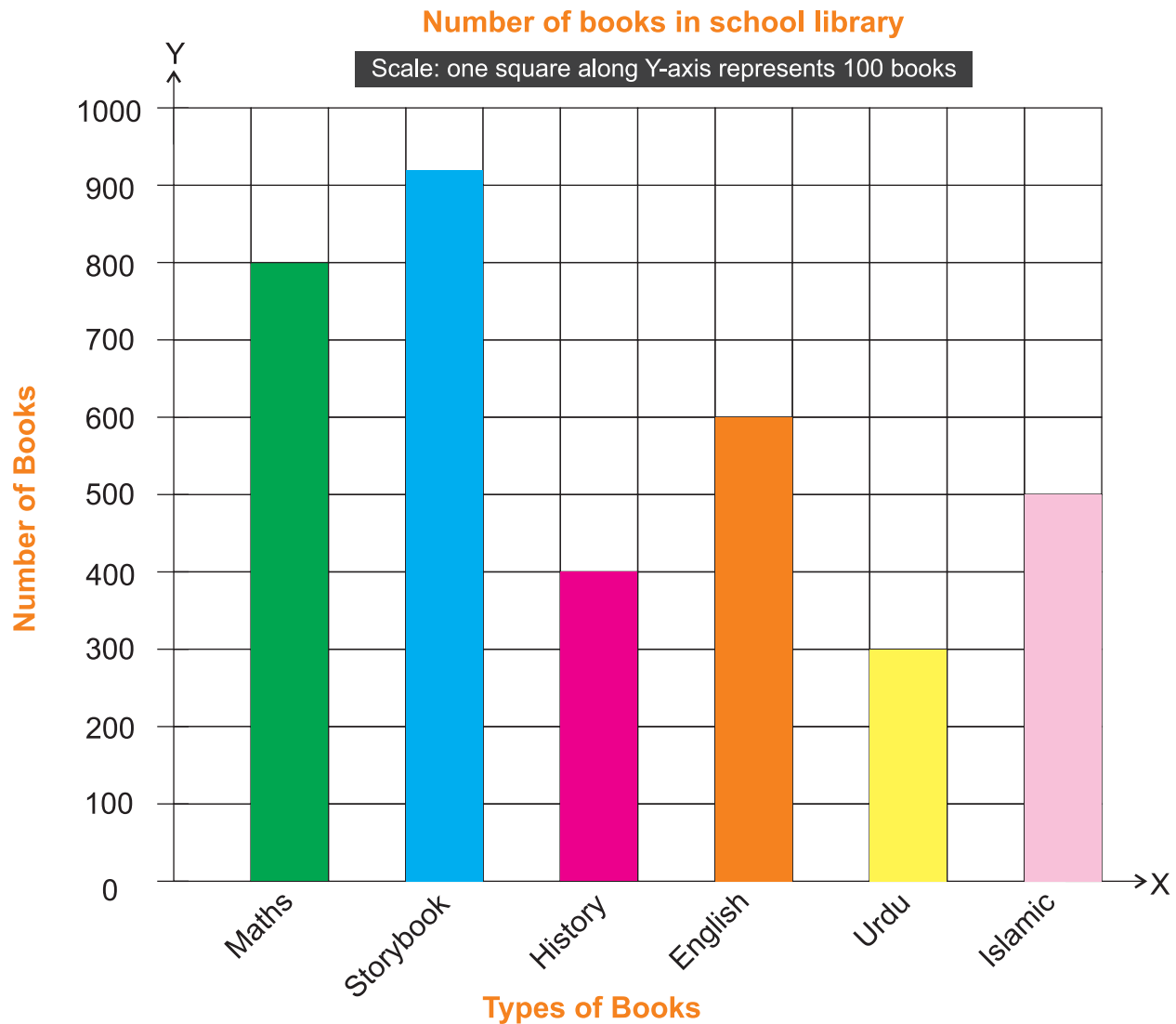
f) How many students come to school by foot?

Solution:

Answer: 6

As 3 squares are coloured, so it means 6 students come to school by foot.

3. The following graph shows the number of books in a school library.



a) How many maths books are in library?

Solution:

Answer: 800

b) How many less History books than storybooks are in the library?

Solution:

Answer: 520

Number of storybooks = 920

Number of history books = 400

Difference = $920 - 400 = 520$

So there are 520 fewer history books than storybooks in the library.

c) Which books are the least in number?

Solution:

Answer: Urdu

There are only 300 urdu books.

d) Which books are the most in number?

Solution:

Answer: Storybooks

There are 920 story books.

e) How many more books of English are there than Urdu?

Solution:

Answer: 300

Number of English books = 600

Number of Urdu books = 300

Difference = $600 - 300 = 300$

So there are 300 more English books than Urdu.

f) How many books are there altogether in the library?

Solution:

Answer: 3520

Number of Math books = 800

Number of Story books = 920

Number of History books = 400

Number of English books = 600

Number of Urdu books = 300

Number of Islmic books = 500

Number of books altogether = $800+920+400+600+300+500$

= 3520

So there are 3520 books altogether

Unit Check 9

1. Encircle the correct options.

a) (ii) 4

$$\text{Solution: } \left(\text{number of quantities } \frac{\text{Sum of quantities}}{\text{saved in 6 weeks}} = \frac{36}{9} = 4 \right)$$

b) (iv) 315

$$\text{Solution: } (\text{sum of values} = \text{number of values} \times \text{average} = 45 \times 7 = 315)$$

c) (i) (sum of quantities $\div$ number quantities)

d) (v) 85

$$\text{Solution: } \left(\text{average} = \frac{\text{Sum of values}}{\text{number of values}} = \frac{510}{6} = 85 \right)$$

e) (iv) (data)

2. Find the average of the first 7 even numbers.

Solution:

$$\text{First seven even number} = 2, 4, 6, 8, 10, 12, 14$$

$$\begin{aligned} \text{Sum of first 7 even number} &= 2 + 4 + 6 + 8 + 10 + 12 + 14 \\ &= 56 \end{aligned}$$

Using formula:

$$\begin{aligned} &= \frac{\text{Sum of values}}{\text{Do of values}} \\ &= \frac{56}{7} = 8 \end{aligned}$$

So the average of the first 7 even number is 8.

3. The sum of 8 numbers is 1608. Find the average of these numbers.

Solution:

Numbers = 8

Sum of 8 numbers = 1608

average of 8 number = ?

Using formula:

$$\begin{aligned}\text{Average} &= \frac{\text{Sum of values}}{\text{number of values}} \\ &= \frac{1608}{8} = 201\end{aligned}$$

So the average of these 8 numbers is 201.

4. The average mass of 8 students of grade 5 is 45 kg. What is the sum of their masses?

Solution:

Number of students = 8

average mass of 8 students = 45 kg

Sum of values = ?

Using formula:

Sum of values = Average $\times$ number of values

Sum of masses = 45 kg $\times$ 8

= 360 kg

So the sum of the masses of 8 students is 360 kg.

5. Find the missing quantities of the following.

	Average	Number of quantities	Sum of quantities
a)	35.5	7	248.5
b)	46	6	276
c)	25	8	200

Solution: a

Given:

$$\text{Average} = 35.5$$

$$\text{Sum of quantities} = 248.5$$

$$\text{Number of quantities} = ?$$

Using formula:

$$\begin{aligned}\text{number of quantities} &= \frac{\text{sum of quantities}}{\text{average}} \\ &= \frac{248.5}{35.5} = 7\end{aligned}$$

Solution: b

Given:

$$\text{Average} = 46$$

$$\text{Number of quantities} = 6$$

$$\text{Sum of quantities} = ?$$

Using formula:

$$\begin{aligned}\text{Sum of quantities} &= \text{Average} \times \text{number of quantities} \\ &= 46 \times 6 \\ &= 276\end{aligned}$$

Solution: c

Given:

$$\text{Average} = ?$$

$$\text{Number of quantities} = 8$$

$$\text{Sum of quantities} = 200$$

Using formula:

$$\begin{aligned}\text{Average} &= \frac{\text{sum of quantities}}{\text{number of quantities}} \\ &= \frac{200}{8} = 25\end{aligned}$$

6. The following table shows the number of students of grades 1-5 who attended the annual school function. Draw a vertical bar graph for this data.

Grades	1	2	3	4	5
Number of students	70	40	50	60	30

Solution:

Step I: Draw the x-axis and y-axis

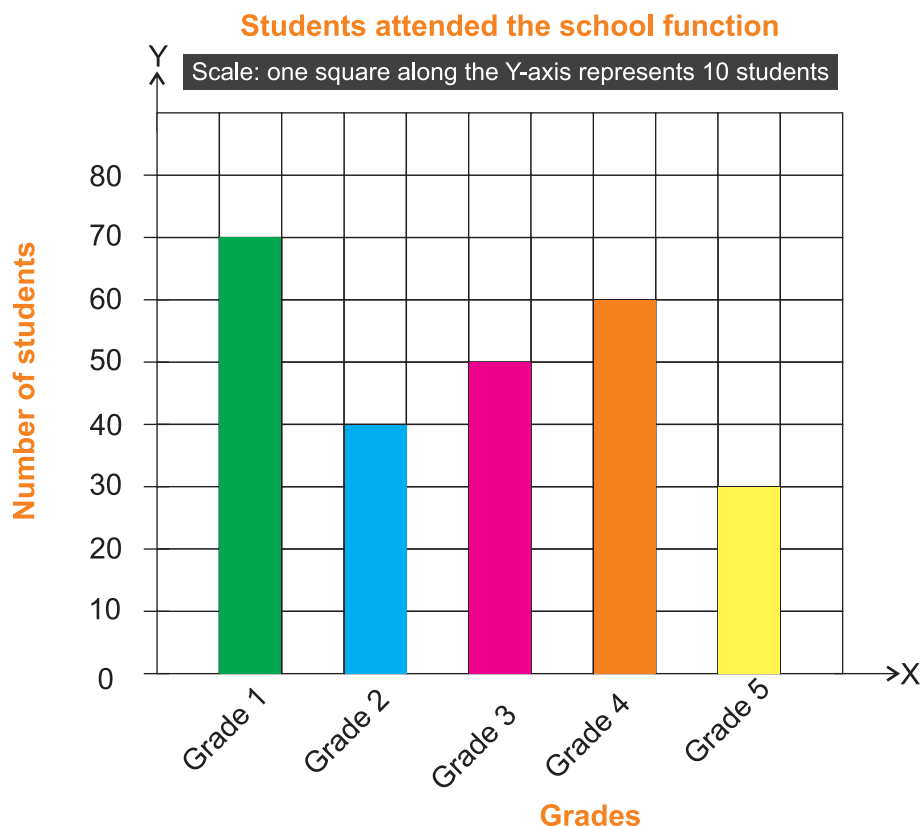
Step II: Write the grades along x-axis and number of students along y-axis.

Also name the graph.

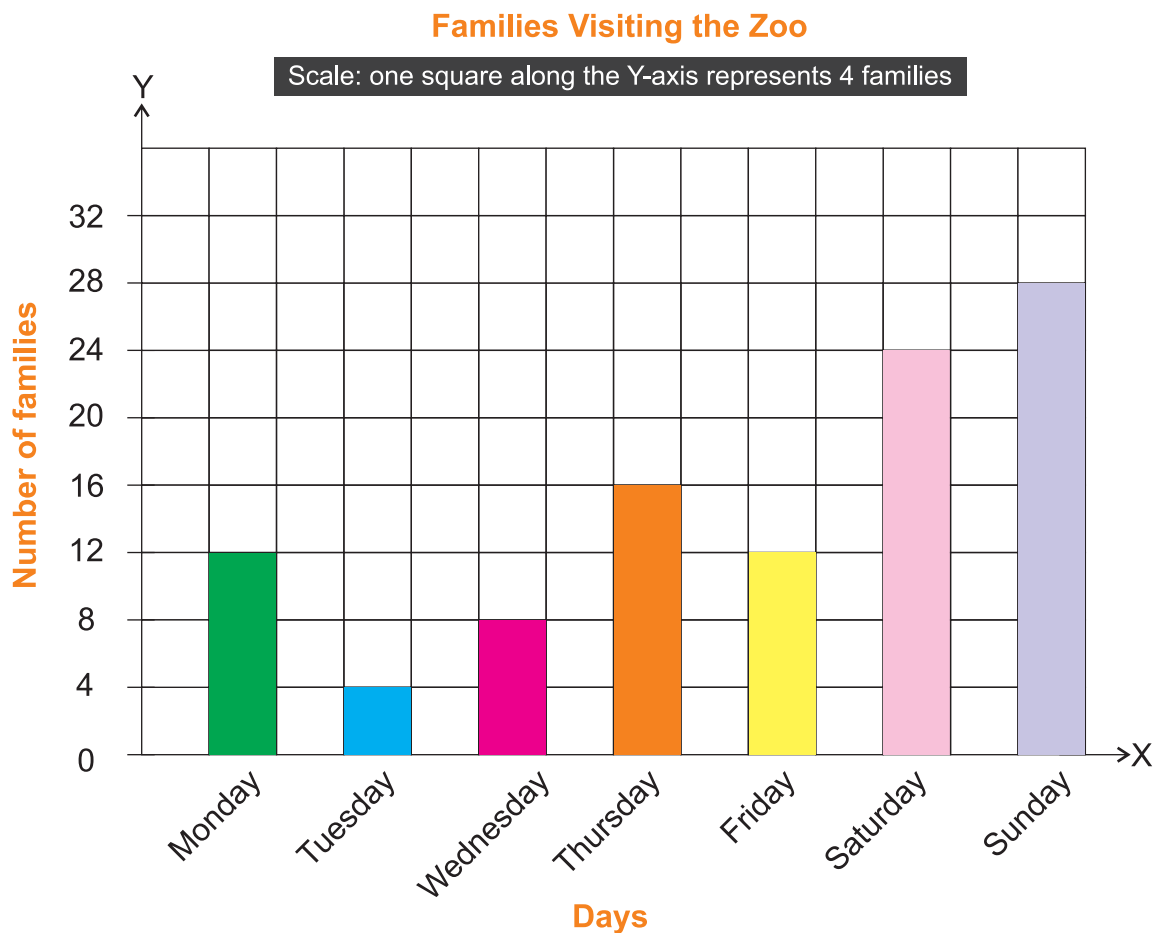
Step III: Select a suitable scale according to the given data. Here 1 square along y-axis represents 10 students.

Step IV: Colour the squares according to the data values.

70 students of grade 1 attended the annual school function, so we colour 7 squares in the graph. Similarly, colour the correct number of squares for other data values.



7. This bar graph shows the number of families who visited a zoo during a week.



Solution:

(a) answer: 28

(b) answer: Monday and Friday

12 families visited the zoo on Monday and on Friday.

(c) answer: Sunday

28 families visited on Sunday

(d) answer: 104

Number of families who visited on Monday = 12

Number of families who visited on Tuesday = 4

Number of families who visited on Wednesday = 8

Number of families who visited on Thursday = 16

Number of families who visited on Friday = 12
Number of families who visited on Saturday = 24
Number of families who visited on Sunday = 28
Number of families altogether = $12+4+8+16+12+24+28$
= 104

So 104 families visited the zoo altogether

(e) answer: 8

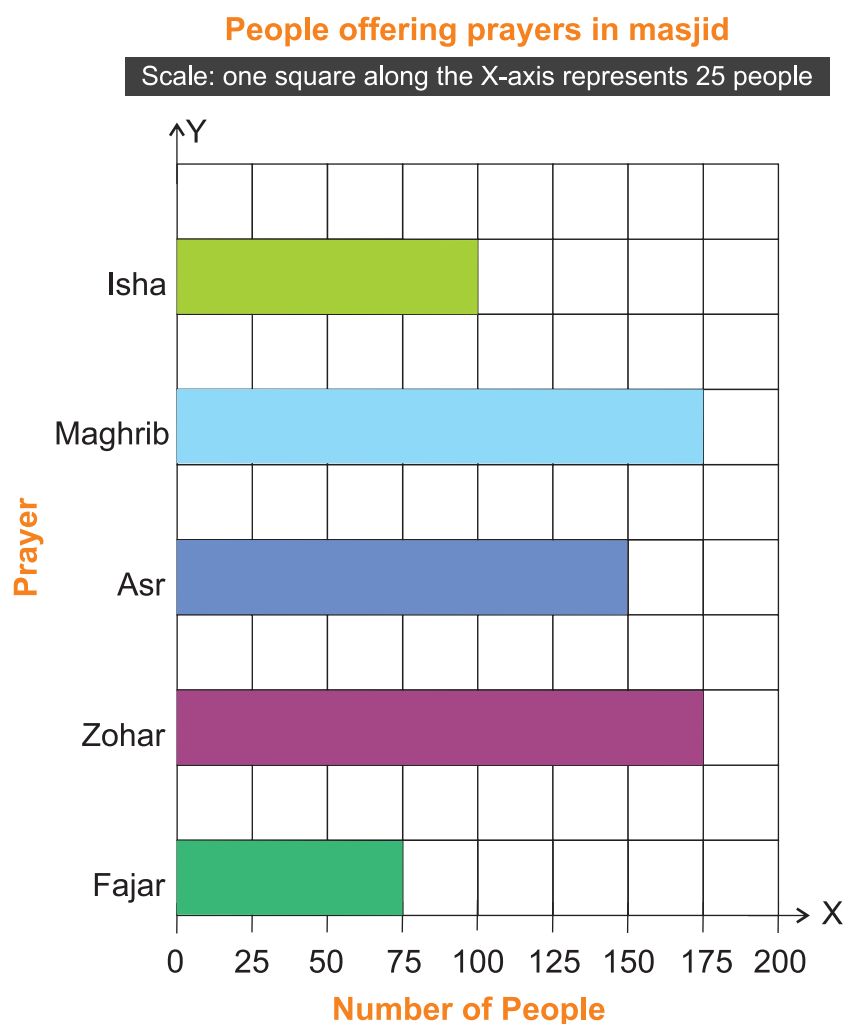
Number of families who visited on Saturday = 24
Number of families who visited on Thursday = 16
Difference = $24 - 16 = 8$

So 8 more families visited on Saturday than on thursday.

(f) answer: Tuesday

Only 4 families visited on tuesday.

8. Ali collected information about people who offer their prayers on a certain day in the local masjid during Ramadan. The following horizontal bar graph shows the data he collected. Observe it and then complete the given sentences.



Solution:

(a) answer: 75

(b) answer: Isha

c) answer: Zohar and Maghrib

175 people went to masjid for zohar and maghrib prayer.

d) answer: Fajar

Only 75 people went to the masjid for fajar prayer.

e) answer: 75

Number of people who went for maghrib prayer = 175

Number of people who went for Isha prayer = 100

Difference = $175 - 100 = 75$

So, 75 more people went in Maghrib prayer than Isha prayer.

f) answer: 675

Number of people in Fajar prayer = 75

Number of people in Zahar prayer = 175

Number of people in Asr prayer = 150

Number of people in Maghrib prayer = 175

Number of people in Isha prayer = 100

Total number of people = $75 + 175 + 150 + 175 + 100$

= 675

So, altogether 675 people went to the masjid on that day