Mathematics

(Chapter – 1) (Knowing Your Numbers)

(Class – VI)

Exercise 1.1

Question 1:

Fill in the blanks:

(a) 1 lakh = _____ ten thousand

(b) 1 million = _____ hundred thousand

(c) 1 crore = _____ ten lakh

(d) 1 crore = _____ million

(e) 1 million = _____ lakh

Answer 1:

(a) 10

(b) 10

(c) 10

(d) 10

(e) 10

Question 2:

Place commas correctly and write the numerals:

(a) Seventy-three lakh seventy-five thousand three hundred seven.

(b) Nine crore five lakh forty-one.

(c) Seven crore fifty-two lakh twenty-one thousand three hundred two.

(d) Fifty-eight million four hundred twenty-three thousand two hundred two.

(e) Twenty-three lakh thirty thousand ten.

Answer 2:

(a) 73,75,307

(b) 9,05,00,041

(c) 7,52,21,302

(d) 58,423,202

(e) 23,30,010

Question 3:

Insert commas suitable and write the names according to Indian system of numeration:

(a) 87595762

(b) 8546283

(c) 99900046

(d) 98432701

Answer 3:

(a) 8,75,95,762
Eight crore seventy-five lakh ninety-five thousand seven hundred sixty-two.

(b) 85,46,283
Eight-five lakh forty-six thousand two hundred eighty-three.

(c) 9,99,00,046
Nine crore ninety-nine lakh forty-six.

(d) 9,84,32,701
Nine crore eighty-four lakh thirty-two thousand seven hundred one.

Question 4:

Insert commas suitable and write the names according to International system of numeration:

(a) 78921092
(b) 7452283
(c) 99985102
(d) 48049831

Answer 4:

(a) 78,921,092
Seventy-eight million nine hundred twenty-one thousand ninety-two

(b) 7,452,483
Seven million four hundred fifty-two thousand two hundred eighty-three

(c) 99,985,102
Ninety-nine million nine hundred eighty-five thousand one hundred two

(d) 48,049,831
Forty-eight million forty-nine thousand eight hundred thirty-one

Exercise 1.2

Question 1:

A book exhibition was held for four days in a school. The number of tickets sold at the counter on the first, second, third and final day was respectively 1094, 1812, 2050 and 2751. Find the total number of tickets sold on all the four days.

Answer 1:

Number of tickets sold on first day	= 1,094
Number of tickets sold on second day	= 1,812
Number of tickets sold on third day	= 2,050
Number of tickets sold on fourth day	= + 2,751
Total tickets sold	= 7,707

Therefore, 7,707 tickets were sold on all the four days.

Question 2:

Shekhar is a famous cricket player. He has so far scored 6980 runs in test matches. He wishes to complete 10,000 runs. How many more runs does he need?

Answer 2:

Runs to achieve	= 10,000
Runs scored	= – 6,980
Runs required	= 3,020

Therefore, he needs 3,020 more runs.

Question 3:

In an election, the successful candidate registered 5,77,500 votes and his nearest rival secured 3,48,700 votes. By what margin did the successful candidate win the election?

Answer 3:

Number of votes secured by successful candidates	= 5,77,500
Number of votes secured by his nearest rival	= – 3,48,700
Margin between them	= 2,28,800

Therefore, the successful candidate won by a margin of 2,28,800 votes.

Question 4:

Kirti Bookstore sold books worth ₹2,85,891 in the first week of June and books worth ₹4,00,768 in the second week of the month. How much was the sale for the two weeks together? In which week was the sale greater and by how much?

Answer 4:

Books sold in first week	= 2,85,891
Books sold in second week	= + 4,00,768
Total books sold	= 6,86,659

Since, 4,00,768,> 2,85,891

Therefore sale of second week is greater than that of first week.

Books sold in second week	= 4,00,768
Books sold in first week	= – 2,85,891
More books sold in second week	= 1,14,877

Therefore, 1,14,877 more books were sold in second week.

Question 5:

Find the difference between the greatest and the least number that can be written using the digits 6, 2, 7, 4, 3 each only once.

Answer 5:

Greatest five-digit number using digits 6,2,7,4,3	= 76432
Smallest five-digit number using digits 6,2,7,4,3	= – 23467
Difference	= 52965

Therefore the difference is 52965.

Question 6:

A machine, on an average, manufactures 2,825 screws a day. How many screws did it produce in the month of January 2006?

Answer 6:

Number of screws manufactured in one day	= 2,825
Number of days in the month of January (31 days)	= 2,825 x 31
	= 87,575

Therefore, the machine produced 87,575 screws in the month of January.

Question 7:

A merchant had ₹78,592 with her. She placed an order for purchasing 40 radio sets at ₹1,200 each. How much money will remain with her after the purchase?

Answer 7:

Cost of one radio	= ₹ 1200
Cost of 40 radios = 1200 x 40	= ₹ 48,000

Now,

Total money with merchant	= ₹ 78,592
Money spent by her	= – ₹ 48,000
Money left with her	= ₹ 30,592

Therefore, ₹ 30,592 will remain with her after the purchase.

Question 8:

A student multiplied 7236 by 65 instead of multiplying by 56. By how much was his answer greater than the correct answer?

Answer 8:

Wrong answer = 7236 x 65

$$\begin{array}{r} 7236 \\ \times\ 65 \\ \hline 36180 \\ 43416\ \times \\ \hline 470340 \end{array}$$

Correct answer = 7236 x 56

$$\begin{array}{r} 7236 \\ \times\ 56 \\ \hline 43416 \\ 36180\ \times \\ \hline 405216 \end{array}$$

Difference in answers = 470340 – 405216

= 65,124

Question 9:

To stitch a shirt 2 m 15 cm cloth is needed. Out of 40 m cloth, how many shirts can be stitched and how much cloth will remain?

Answer 9:

Cloth required to stitch one shirt = 2 m 15 cm
= 2 x 100 cm + 15 cm
= 215 cm

Length of cloth = 40 m = 40 x 100 cm = 4000 cm

Number of shirts can be stitched = 4000 ÷ 215

$$
\begin{array}{r}
18 \\
215\overline{)\,4000} \\
-\;215 \\
\hline
1850 \\
-1720 \\
\hline
130
\end{array}
$$

Therefore, 18 shirts can be stitched and 130 cm (1 m 30 cm) cloth will remain.

Question 10:

Medicine is packed in boxes, each weighing 4 kg 500 g. How many such boxes can be loaded in a can which cannot carry beyond 800 kg?

Answer 10:

The weight of one box = 4 kg 500 g = 4 x 1000 g + 500 g = 4500 g

Maximum load can be loaded in van = 800 kg = 800 x 1000 g = 800000 g

Number of boxes = 800000 ÷ 4500

$$
\begin{array}{r}
177 \\
4500\overline{)\,800000} \\
-\;4500 \\
\hline
35000 \\
-31500 \\
\hline
35000 \\
-31500 \\
\hline
3500
\end{array}
$$

Therefore, 177 boxes can be loaded.

Question 11:

The distance between the school and the house of a student's house is 1 km 875 m. Every day she walks both ways. Find the total distance covered by her in six days.

Answer 11:

Distance between school and home	= 1.875 km
Distance between home and school	= + 1.875 km
Total distance covered in one day	= 3.750 km

Distance covered in six days = 3.750 x 6 = 22.500 km

Therefore, 22 km 500 m distance covered in six days.

Question 12:

A vessel has 4 litres and 500 ml of curd. In how many glasses each of 25 ml capacity, can it be filled?

Answer 12:

Capacity of curd in a vessel = 4 litres 500 ml = 4 x 1000 ml + 500 ml = 4500 ml

Capacity of one glass = 25 ml

Number of glasses can be filled = 4500 ÷ 25

$$
\begin{array}{r}
180 \\
25\overline{)\,4500} \\
-25 \\
\hline
200 \\
-200 \\
\hline
0
\end{array}
$$

Therefore, 180 glasses can be filled by curd.

Exercise 1.3

Question 1:

Estimate each of the following using general rule:

(a) 730 + 998

(b) 796 – 314

(c) 12,904 + 2,888

(d) 28,292 – 21,496

Answer 1:

(a) 730 round off to 700
998 round off to 1000
Estimated sum = 1700

(b) 796 round off to 800
314 round off to 300
Estimated sum = 500

(c) 12904 round off to 13000
2888 round off to 3000
Estimated sum = 16000

(d) 28292 round off to 28000
21496 round off to 21000
Estimated difference= 7000

Question 2:

Give a rough estimate (by rounding off to nearest hundreds) and also a closer estimate (by rounding off to nearest tens):

(a) 439 + 334 + 4317

(b) 1,08,737 – 47,599

(c) 8325 – 491

(d) 4,89,348 – 48,365

Answer 2:

(a) 439 round off to 400
334 round off to 300
4317 round off to 4300
Estimated sum = 5000

(b) 108734 round off to 108700
47599 round off to 47600
Estimated difference = 61100

(c) 8325 round off to 8300
491 round off to 500
Estimated difference = 7800

(d) 489348 round off to 489300
48365 round off to 48400
Estimated difference = 440900

Question 3:

Estimate the following products using general rule:

(a) 578 x 161

(b) 5281 x 3491

(c) 1291 x 592

(d) 9250 x 29

Answer 3:

(a) 578 x 161

578 round off to 600

161 round off to 200

The estimated product = 600 x 200 = 1,20,000

(b) 5281 x 3491

5281 round of to 5,000

3491 round off to 3,500

The estimated product = 5,000 x 3,500 = 1,75,00,000

(c) 1291 x 592

1291 round off to 1300

592 round off to 600

The estimated product = 1300 x 600 = 7,80,000

(d) 9250 x 29

9250 round off to 10,000

229 round off to 30

The estimated product = 10,000 x 30 = 3,00,000

Mathematics

(Chapter – 2) (Whole Numbers)

(Class – VI)

Exercise 2.1

Question 1:

Write the next three natural numbers after 10999.

Answer 1:

10,999 + 1 = 11,000
11,000 + 1 = 11,001
11,001 + 1 = 11,002

Question 2:

Write the three whole numbers occurring just before 10001.

Answer 2:

10,001 – 1 = 10,000
10,000 – 1 = 9,999
9,999 – 1 = 9,998

Question 3:

Which is the smallest whole number?

Answer 3:

'0' (zero) is the smallest whole number.

Question 4:

How many whole numbers are there between 32 and 53?

Answer 4:

53 – 32 – 1 = 20

There are 20 whole numbers between 32 and 53.

Question 5:

Write the successor of:

(a) 2440701 (b) 100199 (c) 1099999 (d) 2345670

Answer 5:

(a) Successor of 2440701 is 2440701 + 1 = 2440702
(b) Successor of 100199 is 100199 + 1 = 100200
(c) Successor of 1099999 is 1099999 + 1 = 1100000
(d) Successor of 2345670 is 2345670 + 1 = 2345671

Question 6:

Write the predecessor of:

(a) 94 (b) 10000

(c) 208090 (d) 7654321

Answer 6:

(a) The predecessor of 94 is 94 – 1 = 93

(b) The predecessor of 10000 is 10000 – 1 = 9999

(c) The predecessor of 208090 is 208090 – 1 = 208089

(d) The predecessor of 7654321 is 7654321 – 1 = 7654320

Question 7:

In each of the following pairs of numbers, state which whole number is on the left of the other number on the number line? Also write them with the appropriate sign (>, <) between them.

(a) 530, 503 (b) 370, 307

(c) 98765, 56789 (d) 9830415, 10023001

Answer 7:

(a) 530 > 503;
So 503 appear on left side of 530 on number line.

(b) 370 > 307;
So 307 appear on left side of 370 on number line.

(c) 98765 > 56789;
So 56789 appear on left side of 98765 on number line.

(d) 9830415 < 10023001;
So 9830415 appear on left side of 10023001 on number line.

Question 8:

Which of the following statements are true (T) and which are false (F):

(a) Zero is the smallest natural number.
(b) 400 is the predecessor of 399.
(c) Zero is the smallest whole number.
(d) 600 is the successor of 599.
(e) All natural numbers are whole numbers.
(f) All whole numbers are natural numbers.
(g) The predecessor of a two digit number is never a single digit number.
(h) 1 is the smallest whole number.
(i) The natural number 1 has no predecessor.
(j) The whole number 1 has no predecessor.
(k) The whole number 13 lies between 11 and 12.
(l) The whole number 0 has no predecessor.
(m) The successor of a two digit number is always a two digit number.

Answer 8:

(a) False (b) False (c) True (d) True
(e) True (f) False (g) False (h) False
(i) True (j) False (k) False (l) True
(m) False

Exercise 2.2

Question 1:

Find the sum by suitable rearrangement:

(a) 837 + 208 + 363 (b) 1962 + 453 + 1538 + 647

Answer 1:

(a) 837 + 208 + 363
= (837 + 363) + 208
= 1200 + 208
= 1408

(b) 1962 + 453 + 1538 + 647
= (1962 + 1538) + (453 + 647)
= 3500 + 1100
= 4600

Question 2:

Find the product by suitable arrangement:

(a) 2 x 1768 x 50
(b) 4 x 166 x 25
(c) 8 x 291 x 125
(d) 625 x 279 x 16
(e) 285 x 5 x 60
(f) 125 x 40 x 8 x 25

Answer 2:

(a) 2 x 1768 x 50
= (2 x 50) x 1768
= 100 x 1768
= 176800

(b) 4 x 166 x 25
= (4 x 25) x 166
= 100 x 166
= 16600

(c) 8 x 291 x 125
= (8 x 125) x 291
= 1000 x 291
= 291000

(b) 625 x 279 x 16
= (625 x 16) x 279
= 10000 x 279
= 2790000

(e) 285 x 5 x 60
= 284 x (5 x 60)
= 284 x 300
= 85500

(f) 125 x 40 x 8 x 25
= (125 x 8) x (40 x 25)
= 1000 x 1000
= 1000000

Question 3:

Find the value of the following:

(a) 297 x 17 + 297 x 3

(b) 54279 x 92 + 8 x 54279

(c) 81265 x 169 – 81265 x 69

(d) 3845 x 5 x 782 + 769 x 25 x 218

Answer 3:

(a) 297 x 17 + 297 x 3
= 297 x (17 + 3)
= 297 x 20
= 5940

(b) 54279 x 92 + 8 x 542379
= 54279 x (92 + 8)
= 54279 x 100
= 5427900

(c) 81265 x 169 – 81265 x 69
= 81265 x (169 – 69)
= 81265 x 100
= 8126500

(d) 3845 x 5 x 782 + 769 x 25 x 218
= 3845 x 5 x 782 + 769 x 5 x 5 x 218)
= 3845 x 5 x 782 + 3845 x 5 x 218
= 3845 x 5 x (782 + 218)
= 3845 x 5 x 1000
= 19225000

Question 4:

Find the product using suitable properties:

(a) 738 x 103

(b) 854 x 102

(c) 258 x 1008

(d) 1005 x 168

Answer 4:

(a) 738 x 103
= 738 x (100 + 3)
= 738 x 100 + 738 x 3
= 73800 + 2214
= 76014

(b) 854 x 102
= 854 x (100 + 2)
= 854 x 100 + 854 x 2
= 85400 + 1708
= 87108

(c) 258 x 1008
= 258 x (1000 + 8)
= 258 x 1000 + 258 x 8
= 258000 + 2064
= 260064

(d) 1005 x 168
= (1000 + 5) x 168
= 1000 x 168 + 5 x 168
= 168000 + 840
= 168840

Question 5:

A taxi-driver, filled his car petrol tank with 40 litres of petrol on Monday. The next day, he filled the tank with 50 litres of petrol. If the petrol costs ₹ 44 per litre, how much did he spend in all on petrol?

Answer 5:

Petrol filled on Monday = 40 litres
Petrol filled on next day = 50 litres
Total petrol filled = 90 litres
Now,
Cost of 1 litre petrol = ₹ 44
Cost of 90 litres petrol = 44 x 90
= 44 x (100 – 10)
= 44 x 100 – 44 x 10
= 4400 – 440
= ₹ 3960
Therefore, he spent ₹ 3960 on petrol.

Question 6:

A vendor supplies 32 litres of milk to a hotel in a morning and 68 litres of milk in the evening. If the milk costs ₹15 per litre, how much money is due to the vendor per day?

Answer 6:

Supply of milk in morning = 32 litres
Supply of milk in evening = 68 litres
Total supply = 32 + 68 = 100 litres
Now
Cost of 1 litre milk = ₹15
Cost of 100 litres milk = 15 x 100 = ₹1500
Therefore, ₹1500 is due to the vendor per day.

Question 7:

Match the following:

(i)	425 x 136 = 425 x (6 + 30 + 100)	(a)Commutativity under multiplication
(ii)	2 x 48 x 50 = 2 x 50 x 49	(b) Commutativity under addition
(iii)	80 + 2005 + 20 = 80 + 20 + 2005	(c) Distributivity multiplication under addition

Answer 7:

(i)	425 x 136 = 425 x (6 + 30 + 100)	(c) Distributivity of multiplication over addition
(ii)	2 x 49 x 50 = 2 x 50 x 49	(a) Commutivity under multiplication
(iii)	80 + 2005 + 20 = 80 + 20 + 2005	(b) Commutivity under addition

Exercise 2.3

Question 1:

Which of the following will not represent zero:

(a) 1 + 0 (b) 0 x 0

(c) $\frac{0}{2}$ (d) $\frac{10-10}{2}$

Answer 1:

(a) [1 + 0 is equal to 1]

Question 2:

If the product of two whole numbers is zero, can we say that one or both of them will be zero? Justify through examples.

Answer 2:

Yes, if we multiply any number with zero the resultant product will be zero.

Example: 2 x 0 = 0, 5 x 0 = 0, 9 x 0 = 0

If both numbers are zero, then the result also be zero.

0 x 0 = 0

Question 3:

If the product of two whole number is 1, can we say that one or both of them will be 1? Justify through examples.

Answer 3:

If only one number be 1 then the product cannot be 1.

Examples: 5 x 1 = 5, 4 x 1 = 4, 8 x 1 = 8

If both number are 1, then the product is 1

1 x 1 = 1

Question 4:

Find using distributive property:

(a) 728 x 101 (b) 5437 x 1001

(c) 824 x 25 (d) 4275 x 125

(e) 504 x 35

Answer 4:

(a) 728 x 101
= 728 x (100 + 1)
= 728 x 100 + 728 x 1
= 72800 + 728
= 73528

(b) 5437 x 1001
= 5437 x (1000 + 1)
= 5437 x 1000 + 5437 x 1
= 5437000 + 5437
= 5442437

(c) 824 x 25
= 824 x (20 + 5)
= 824 x 20 + 824 x 5
= 16480 + 4120
= 20600

(d) 4275 x 125
= 4275 x (100 + 20 + 5)
= 4275 x 100 + 4275 x 20 + 4275 x5
= 427500 + 85500 + 21375
= 534375

(e) 504 x 35
= (500 + 4) x 35
= 500 x 35 + 4 x 35
= 17500 + 140
= 17640

Question 5:

Study the pattern:

1 x 8 + 1 = 9; 12 x 8 + 2 = 98; 123 x 8 + 3 = 987
1234 x 8 + 4 = 9876; 12345 x 8 + 5 = 98765

Write the next two steps. Can you say how the pattern works?

Answer 5:

123456 x 8 + 6 = 987654
1234567 x 8 + 7 = 9876543
Pattern works like this:
1 x 8 + 1 = 9
12 x 8 + 2 = 98
123 x 8 + 3 = 987
1234 x 8 + 4 = 9876
12345 x 8 + 5 = 98765
123456 x 8 + 6 = 987654
1234567 x 8 + 7 = 9875643

Mathematics

(Chapter – 3) (Playing With Numbers)

(Class – VI)

Exercise 3.1

Question 1:

Write all the factors of the following numbers:

(a) 24 (b) 15 (c) 21 (d) 27

(e) 12 (f) 20 (g) 18 (h) 23

(i) 36

Answer 1:

(a) 24 = 1 x 24 = 2 x 12 = 3 x 8 = 4 x 6 = 6 x 4

∴ Factors of 24 = 1, 2, 3, 4, 6, 12, 24

(b) 15 = 1 x 15 = 3 x 5 = 5 x 3

∴ Factors of 15 = 1, 3, 5, 15

(c) 21 = 1 x 21 = 3 x 7 = 7 x 3

∴ Factors of 21 = 1, 3, 7, 21

(d) 27 = 1 x 27 = 3 x 9 = 9 x 3

∴ Factors of 27 = 1, 3, 9, 27

(e) 12 = 1 x 12 = 2 x 6 = 3 x 4 = 4 x 3

∴ Factors of 12 = 1, 2, 3, 4, 6, 12

(f) 20 = 1 x 20 = 2 x 10 = 4 x 5 = 5 x 4

∴ Factors of 20 = 1, 2, 4, 5, 10, 20

(g) 18 = 1 x 18 = 2 x 9 = 3 x 6

∴ Factors of 18 = 1, 2, 3, 6, 9, 18

(h) 23 = 1 x 23

∴ Factors of 23 = 1, 23

(i) 36 = 1 x 36 = 2 x 18 = 3 x 12 = 4 x 9 = 6 x 6

∴ Factors of 36 = 1, 2, 3, 4, 6, 9, 12, 18, 36

Question 2:

Write first five multiples of:

(a) 5 (b) 8 (c) 9

Answer 2:

(a) 5 x 1 = 5, 5 x 2 = 10, 5 x 3 = 15, 5 x 4 = 20, 5 x 5 = 25

∴ First five multiples of 5 are 5, 10, 15, 20, 25.

(b) 8 x 1 = 8, 8 x 2 = 16, 8 x 3 = 24, 8 x 4 = 32, 8 x 5 = 40

∴ First five multiples of 8 are 8, 16, 24, 32, 40.

(c) 9 x 1 = 9, 9 x 2 = 18, 9 x 3 = ,27, 9 x 4 = 36, 9 x 5 = 45

∴ First five multiples of 9 are 9, 18, 27, 36, 45.

Question 3:

Match the items in column 1 with the items in column 2:

Column 1		Column 2
(i)	35	(a) Multiple of 8
(ii)	15	(b) Multiple of 7
(iii)	16	(c) Multiple of 70
(iv)	20	(d) Factor of 30
(v)	20	(e) Factor of 50

Answer 3:

(i) → (b), (ii) → (d), (iii) → (a), (iv) → (f), (v) → (e)

Question 4:

Find all the multiples of 9 up to 100.

Answer 4:

Multiples of 9 up to 100 are: 9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99

Exercise 3.2

Question 1:

What is the sum of any two:
(a) Odd numbers.
(b) Even numbers.

Answer 1:

(a) The sum of any two odd numbers is an even number.
Example: 1 + 3 = 4, 3 + 5 = 8

(b) The sum of any two even numbers is also an even number.
Example: 2 + 4 = 6, 6 + 8 = 14

Question 2:

State whether the following statements are true or false:

(a) The sum of three odd numbers is even.
(b) The sum of two odd numbers and one even number is even.
(c) The product of three odd numbers is odd.
(d) If an even number is divided by 2, the quotient is always odd.
(e) All prime numbers are odd.
(f) Prime numbers do not have any factors.
(g) Sum of two prime numbers is always even.
(h) 2 is the only even prime number.
(i) All even numbers are composite numbers.
(j) The product of two even numbers is always even.

Answer 2:

(a) False	(b) True	(c) True	(d) False
(e) False	(f) False	(g) False	(h) True
(i) False	(j) True		

Question 3:

The numbers 13 and 31 are prime numbers. Both these numbers have same digits 1 and 3. Find such pairs of prime numbers up to 100.

Answer 3:

17 and 71; 37 and 73; 79 and 97

Question 4:

Write down separately the prime and composite numbers less than 20.

Answer 4:

Prime numbers : 2, 3, 5, 7, 11, 13, 17, 19
Composite numbers : 4, 6, 8, 9, 10, 12, 14, 15, 16, 18

Question 5:

What is the greatest prime number between 1 and 10?

Answer 5:

The greatest prime number between 1 and 10 is '7'.

Question 6:

Express the following as the sum of two odd numbers:

(a) 44 (b) 36 (c) 24 (d) 18

Answer 6:

(a) 3 + 41 = 44
(b) 5 + 31 = 36
(c) 7 + 17 = 24
(d) 7 + 11 = 18

Question 7:

Give three pairs of prime numbers whose difference is 2.
[Remark: Two prime numbers whose difference is 2 are called twin primes.]

Answer 7:

3 and 5; 5 and 7; 11 and 13

Question 8:

Which of the following numbers are prime:

(a) 23 (b) 51 (c) 37 (d) 26

Answer 8:

(a) 23 and (c) 37 are prime numbers.

Question 9:

Write seven consecutive composite numbers less than 100 so that there is no prime number between them.

Answer 9:

Seven consecutive composite numbers:
90, 91, 92, 93, 94, 95, 96

Question 10:

Express each of the following numbers as the sum of three odd primes:
(a) 21 (b) 31 (c) 53 (d) 61

Answer 10:

(a) 21 = 3 + 7 + 11
(b) 31 = 3 + 11 + 17
(c) 53 = 13 + 17 + 23
(d) 61 = 19 + 29 + 13

Question 11:

Write five pairs of prime numbers less than 20 whose sum is divisible by 5.
[Hint: 3 + 7 = 10]

Answer 11:

2 + 3 = 5;
3 + 17 = 20;
5 + 5 = 10
7 + 13 = 20;
2 + 13 = 15;

Question 12:

Fill in the blanks:

(a) A number which has only two factors is called a _____.
(b) A number which has more than two factors is called a _____.
(c) 1 neither _____ nor _____.
(d) The smallest prime number is _____.
(e) The smallest composite number is _____.
(f) The smallest even number is _____.

Answer 12:

(a) Prime number
(b) Composite number
(c) Prime number and composite number
(d) 2
(e) 4
(f) 2

Exercise 3.3

Question 1:

Using divisibility test, determine which of the following numbers are divisible by 2; by 3; by 4; by 5; by 6; by 8; by 9; by 10; by 11. (Say yes or no)

Number	Divisible by								
	2	**3**	**4**	**5**	**6**	**8**	**9**	**10**	**11**
128	Yes	No	Yes	No	No	Yes	No	No	No
990									
1586									
275									
6686									
639210									
429714									
2856									
3060									
406839									

Answer 1:

Number	Divisible by								
	2	**3**	**4**	**5**	**6**	**8**	**9**	**10**	**11**
128	Yes	No	Yes	No	No	Yes	No	No	No
990	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes
1586	Yes	No	No	No	No	No	No	No	No
275	No	No	No	Yes	No	No	No	No	Yes
6686	Yes	No	No	No	No	No	No	No	No
639210	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
429714	Yes	Yes	No	No	Yes	No	Yes	No	No
2856	Yes	Yes	Yes	No	Yes	Yes	No	No	No
3060	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No
406839	No	Yes	No	No	No	no	No	No	No

Question 2:

Using divisibility test, determine which of the following numbers are divisibly by 4; by 8:

(a) 572 (b) 726352 (c) 5500 (d) 6000
(e) 12159 (f) 14560 (g) 21084 (h) 31795072
(i) 1700 (j) 2150

Answer 2:

(a) 572 → Divisible by 4 as its last two digits are divisible by 4.
→ Not divisible by 8 as its last three digits are not divisible by 8.

(b) 726352 → Divisible by 4 as its last two digits are divisible by 4.
→ Divisible by 8 as its last three digits are divisible by 8.

(c) 5500 → Divisible by 4 as its last two digits are divisible by 4.
→ Not divisible by 8 as its last three digits are not divisible by 8.

(d) 6000 → Divisible by 4 as its last two digits are 0.
→ Divisible by 8 as its last three digits are 0.

(e) 12159 → Not divisible by 4 and 8 as it is an odd number.

(f) 14560 → Divisible by 4 as its last two digits are divisible by 4.
→ Divisible by 8 as its last three digits are divisible by 8.

(g) 21084 → Divisible by 4 as its last two digits are divisible by 4.
→ Not divisible by 8 as its last three digits are not divisible by 8.

(h) 31795072 → Divisible by 4 as its last two digits are divisible by 4.
→ Divisible by 8 as its last three digits are divisible by 8.

(i) 1700 → Divisible by 4 as its last two digits are 0.
→ Not divisible by 8 as its last three digits are not divisible by 8.

(j) 5500 → Not divisible by 4 as its last two digits are not divisible by 4.
→ Not divisible by 8 as its last three digits are not divisible by 8.

Question 3:

Using divisibility test, determine which of the following numbers are divisible by 6:

(a) 297144	(b) 1258	(c) 4335	(d) 61233
(e) 901352	(f) 438750	(g) 1790184	(h) 12583
(i) 639210	(j) 17852		

Answer 3:

(a) 297144 → Divisible by 2 as its units place is an even number.
→ Divisible by 3 as sum of its digits (= 27) is divisible by 3.
Since the number is divisible by both 2 and 3, therefore, it is also divisible by 6.

(b) 1258 → Divisible by 2 as its units place is an even number.
→ Not divisible by 3 as sum of its digits (= 16) is not divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

(c) 4335 → Not divisible by 2 as its units place is not an even number.
→ Divisible by 3 as sum of its digits (= 15) is divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

(d) 61233 → Not divisible by 2 as its units place is not an even number.
→ Divisible by 3 as sum of its digits (= 15) is divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

(e) 901352 → Divisible by 2 as its units place is an even number.
→ Not divisible by 3 as sum of its digits (= 20) is not divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

(f) 438750 → Divisible by 2 as its units place is an even number.
→ Divisible by 3 as sum of its digits (= 27) is not divisible by 3.
Since the number is divisible by both 2 and 3, therefore, it is divisible by 6.

(g) 1790184 → Divisible by 2 as its units place is an even number.
→ Divisible by 3 as sum of its digits (= 30) is not divisible by 3.
Since the number is divisible by both 2 and 3, therefore, it is divisible by 6.

(h) 12583 → Not divisible by 2 as its units place is not an even number.
→ Not divisible by 3 as sum of its digits (= 19) is not divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

(i) 639210 → Divisible by 2 as its units place is an even number.
→ Divisible by 3 as sum of its digits (= 21) is not divisible by 3.
Since the number is divisible by both 2 and 3, therefore, it is divisible by 6.

(j) 17852 → Divisible by 2 as its units place is an even number.
→ Not divisible by 3 as sum of its digits (= 23) is not divisible by 3.
Since the number is not divisible by both 2 and 3, therefore, it is not divisible by 6.

Question 4:

Using divisibility test, determine which of the following numbers are divisible by 11:
(a) 5445 (b) 10824 (c) 7138965 (d) 70169308
(e) 10000001 (f) 901153

Answer 4:

(a) 5445 → Sum of the digits at odd places = 4 + 5 = 9
→ Sum of the digits at even places = 4 + 5 = 9
→ Difference of both sums = 9 – 9 = 0
Since the difference is 0, therefore, the number is divisible by 11.

(b) 10824 → Sum of the digits at odd places = 4 + 8 +1 = 13
→ Sum of the digits at even places = 2 + 0 = 2
→ Difference of both sums = 13 – 2 = 11
Since the difference is 11, therefore, the number is divisible by 11.

(c) 7138965 → Sum of the digits at odd places = 5 + 9 + 3 + 7 = 24
→ Sum of the digits at even places = 6 + 8 + 1 = 15
→ Difference of both sums = 24 – 15 = 9
Since the difference is neither 0 nor 11, therefore, the number is not divisible by 11.

(d) 70169308 → Sum of the digits at odd places = 8 + 3 + 6 + 0 = 17
→ Sum of the digits at even places = 0 + 9 + 1 + 7 = 17
→ Difference of both sums = 17 – 17 = 0
Since the difference is 0, therefore, the number is divisible by 11.

(e) 10000001 → Sum of the digits at odd places = 1 + 0 + 0 + 0 = 1
→ Sum of the digits at even places = 0 + 0 + 0 + 1 = 1
→ Difference of both sums = 1 – 1 = 0
Since the difference is 0, therefore, the number is divisible by 11.

(f) 901153 → Sum of the digits at odd places = 3 + 1 + 0 = 4
→ Sum of the digits at even places = 5 + 1 + 9 = 15
→ Difference of both sums = 15 – 4 = 11
Since the difference is 11, therefore, the number is divisible by 11.

Question 5:

Write the smallest digit and the largest digit in the blanks space of each of the following numbers so that the number formed is divisibly by 3:

(a) _____ 6724 (b) 4765 _____ 2

Answer 5:

(a) We know that a number is divisible by 3 if the sum of all digits is divisible by 3.
Therefore, Smallest digit : 2 → 26724 = 2 + 6 + 7 + 2 + 4 = 21
Largest digit : 8 → 86724 = 8 + 6 + 7 + 2 + 4 = 27

(b) We know that a number is divisible by 3 if the sum of all digits is divisible by 3.
Therefore, Smallest digit : 0 → 476502 = 4 + 7 + 6 + 5 + 0 + 2 = 24
Largest digit : 9 → 476592 = 4 + 7 + 6 + 5 + 0 + 2 = 33

Question 6:

Write the smallest digit and the largest digit in the blanks space of each of the following numbers so that the number formed is divisibly by 11:

(a) 92 _____ 389 (b) 8 _____ 9484

Answer 6:

(a) We know that a number is divisible by 11 if the difference of the sum of the digits at odd places and that of even places should be either 0 or 11.
Therefore, 928389 → Odd places = 9 + 8 + 8 = 25
Even places = 2 + 3 + 9 = 14
Difference = 25 – 14 = 11

(b) We know that a number is divisible by 11 if the difference of the sum of the digits at odd places and that of even places should be either 0 or 11.
Therefore, 869484 → Odd places = 8 + 9 + 8 = 25
Even places = 6 + 4 + 4 = 14
Difference = 25 – 14 = 11

Exercise 3.4

Question 1:

Find the common factors of:

(a) 20 and 28

(b) 15 and 25

(c) 35 and 50

(d) 56 and 120

Answer 1:

(a) Factors of 20 = 1, 2, 4, 5, 10, 20

Factors of 28 = 1, 2, 4, 7, 14, 28

Common factors = 1, 2, 4

(b) Factors of 15 = 1, 3, 5, 15

Factors of 25 = 1, 5, 25

Common factors = 1, 5

(c) Factors of 35 = 1, 5, 7, 35

Factors of 50 = 1, 2, 5, 10, 25, 50

Common factors = 1, 5

(d) Factors of 56 = 1, 2, 4, 7, 8, 14, 28, 56

Factors of 120 = 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 30, 60, 120

Common factors = 1, 2, 4, 8

Question 2:

Find the common factors of:

(a) 4, 8 and 12

(b) 5, 15 and 25

Answer 2:

(a) Factors of 4 = 1, 2, 4

Factors of 8 = 1, 2, 4, 8

Factors of 12 = 1, 2, 3, 4, 6, 12

Common factors of 4, 8 and 12 = 1, 2, 4

(b) Factors of 5 = 1, 5

Factors of 15 = 1, 3, 5, 15

Factors of 25 = 1, 5, 25

Common factors of 5, 15 and 25 = 1, 5

Question 3:

Find the first three common multiples of:

(a) 6 and 8 (b) 12 and 18

Answer 3:

(a) Multiple of 6 = 6, 12, 18, 24, 30, 36, 42, 28, 54, 60, 72, ...
Multiple of 8 = 8, 16, 24, 32, 40, 48, 56, 64, 72, ...
Common multiples of 6 and 8 = 24, 48, 72

(b) Multiple of 12 = 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, ...
Multiple of 18 = 18, 36, 54, 72, 90, 108, ...
Common multiples of 12 and 18 = 36, 72, 108

Question 4:

Write all the numbers less than 100 which are common multiples of 3 and 4.

Answer 4:

Multiple of 3 = 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60, 63, 66, 69, 72, 75, 78, 81, 84, 87, 90, 93, 96, 99
Multiple of 4 = 4, 8, 12, 16, 20, 24, 28, 32, 36, 40, 44, 48, 52, 56, 60, 64, 68, 72, 76, 80, 84, 88, 92, 96, 100
Common multiples of 3 and 4 = 12, 24, 36, 48, 60, 72, 84, 96

Question 5:

Which of the following numbers are co-prime:

(a) 18 and 35 (b) 15 and 37
(c) 30 and 415 (d) 17 and 68
(e) 216 and 215 (f) 81 and 16

Answer 5:

(a) Factors of 18 = 1, 2, 3, 6, 9, 18
Factors of 35 = 1, 5, 7, 35
Common factor = 1
Since, both have only one common factor, i.e., 1, therefore, they are co-prime numbers.

(b) Factors of 15 = 1, 3, 5, 15
Factors of 37 = 1, 37
Common factor = 1
Since, both have only one common factor, i.e., 1, therefore, they are co-prime numbers.

(c) Factors of 30 = 1, 2, 3, 5, 6, 15, 30
Factors of 415 = 1, 5, ……., 83, 415
Common factor = 1, 5
Since, both have more than one common factor, therefore, they are not co-prime numbers.

(d) Factors of 17 = 1, 17
Factors of 68 = 1, 2, 4, 17, 34, 86
Common factor = 1, 17
Since, both have more than one common factor, therefore, they are not co-prime numbers.

(e) Factors of 216 = 1, 2, 3, 4, 6, 8, 36, 72, 108, 216
Factors of 215 = 1, 5, 43, 215
Common factor = 1
Since, both have only one common factor, i.e., 1, therefore, they are co-prime numbers.

(f) Factors of 81 = 1, 3, 9, 27, 81
Factors of 16 = 1, 2, 4, 8, 16
Common factor = 1
Since, both have only one common factor, i.e., 1, therefore, they are co-prime numbers.

Question 6:

A number is divisible by both 5 and 12. By which other number will that number be always divisible?

Answer 6:

5 x 12 = 60. The number must be divisible by 60.

Question 7:

A number is divisible by 12. By what other numbers will that number be divisible?

Answer 7:

Factors of 12 are 1, 2, 3, 4, 6 and 12.
Therefore, the number also be divisible by 1, 2, 3 4 and 6.

Exercise 3.5

Question 1:

Which of the following statements are true:

(a) If a number is divisible by 3, it must be divisible by 9.

(b) If a number is divisible by 9, it must be divisible by 3.

(c) If a number is divisible by 18, it must be divisible by both 3 and 6.

(d) If a number is divisible by 9 and 10 both, then it must be divisible by 90.

(e) If two numbers are co-primes, at least one of them must be prime.

(f) All numbers which are divisible by 4 must also by divisible by 8.

(g) All numbers which are divisible by 8 must also by divisible by 4.

(h) If a number is exactly divides two numbers separately, it must exactly divide their sum.

(i) If a number is exactly divides the sum of two numbers, it must exactly divide the two numbers separately.

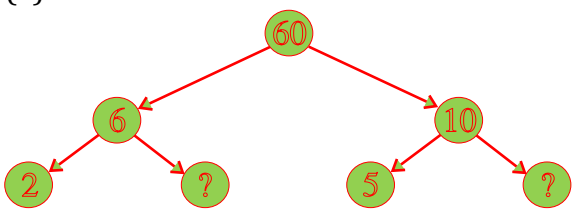
Answer 1:

Statements (b), (c), (d), (g) and (h) are true.

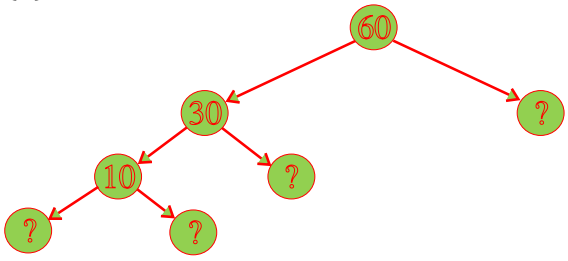
Question 2:

Here are two different factor trees for 60. Write the missing numbers.

(a)

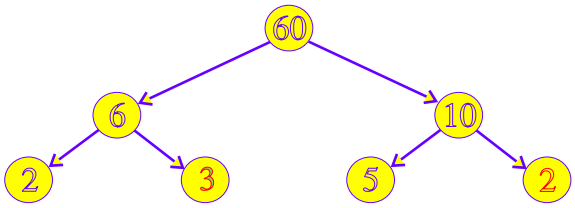


(b)

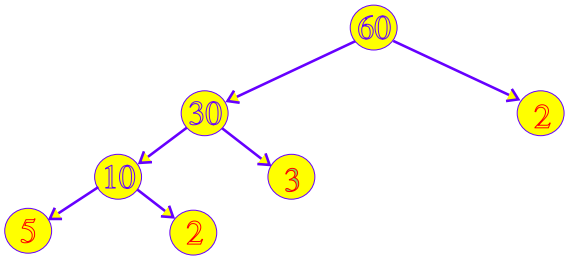


Answer 2:

(a)



(b)



Question 3:

Which factors are not included in the prime factorization of a composite number?

Answer 3:

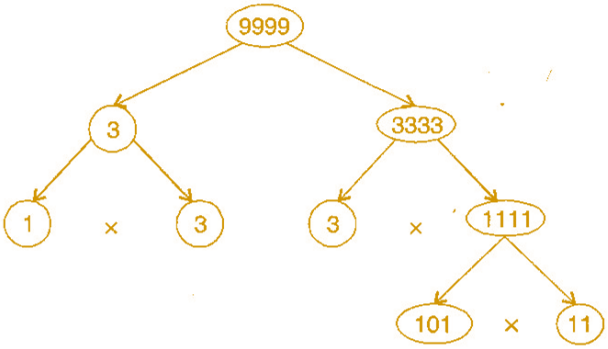
1 is the factor which is not included in the prime factorization of a composite number.

Question 4:

Write the greatest 4-digit number and express it in terms of its prime factors.

Answer 4:

The greatest 4-digit number = 9999



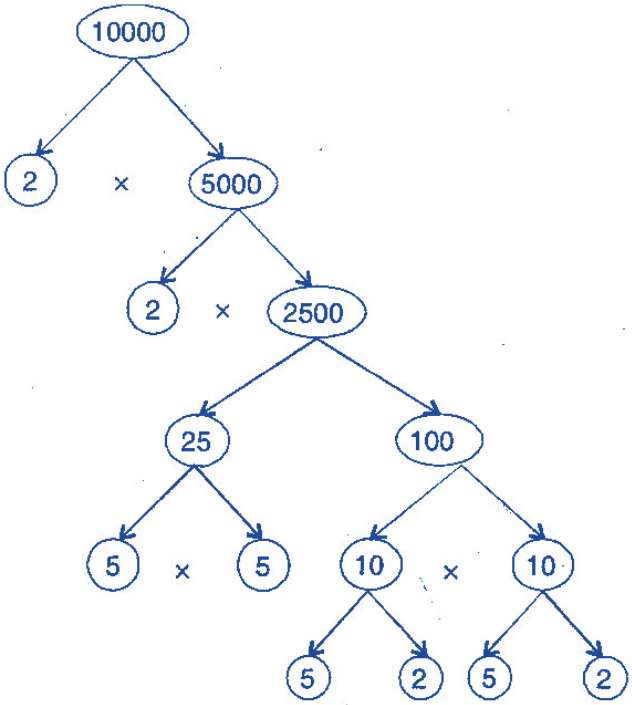
The prime factors of 9999 are 3 × 3 × 11 × 101.

Question 5:

Write the smallest 5-digit number and express it in terms of its prime factors.

Answer 5:

The smallest five digit number is 10000.



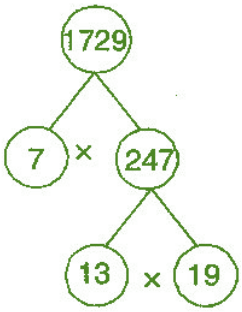
The prime factors of 10000 are 2 × 2 × 2 × 2 × 5 × 5 × 5 × 5.

Question 6:

Find all the prime factors of 1729 and arrange them in ascending order. Now state the relation, if any, between, two consecutive prime numbers.

Answer 6:

Prime factors of 1729 are 7 × 13 × 19.



The difference of two consecutive prime factors is 6.

Question 7:

The product of three consecutive numbers is always divisible by 6. Verify this statement with the help of some examples.

Answer 7:

Among the three consecutive numbers, there must be one even number and one multiple of 3. Thus, the product must be multiple of 6.

Example: (i) 2 x 3 x 4 = 24

(ii) 4 x 5 x 6 = 120

Question 8:

The sum of two consecutive odd numbers is always divisible by 4. Verify this statement with the help of some examples.

Answer 8:

3 + 5 = 8 and 8 is divisible by 4.

5 + 7 = 12 and 12 is divisible by 4.

7 + 9 = 16 and 16 is divisible by 4.

9 + 11 = 20 and 20 is divisible by 4.

Question 9:

In which of the following expressions, prime factorization has been done:

(a) 24 = 2 x 3 x 4

(b) 56 = 7 x 2 x 2 x 2

(c) 70 = 2 x 5 x 7

(d) 54 = 2 x 3 x 9

Answer 9:

In expressions (b) and (c), prime factorization has been done.

Question 10:

Determine if 25110 is divisible by 45.

[Hint: 5 and 9 are co-prime numbers. Test the divisibility of the number by 5 and 9.]

Answer 10:

The prime factorization of 45 = 5 x 9

25110 is divisible by 5 as '0' is at its unit place.

25110 is divisible by 9 as sum of digits is divisible by 9.

Therefore, the number must be divisible by 5 x 9 = 45

Question 11:

18 is divisible by both 2 and 3. It is also divisible by 2 x 3 = 6. Similarly, a number is divisible by 4 and 6. Can we say that the number must be divisible by 4 x 6 = 24? If not, give an example to justify your answer.

Answer 11:

No. Number 12 is divisible by both 6 and 4 but 12 is not divisible by 24.

Question 12:

I am the smallest number, having four different prime factors. Can you find me?

Answer 12:

The smallest four prime numbers are 2, 3, 5 and 7.
Hence, the required number is 2 x 3 x 5 x 7 = 210

Exercise 3.6

Question 1:

Find the H.C.F. of the following numbers:

(a) 18, 48
(b) 30, 42
(c) 18, 60
(d) 27, 63
(e) 36, 84
(f) 34, 102
(g) 70, 105, 175
(h) 91, 112, 49
(i) 18, 54, 81
(j) 12, 45, 75

Answer 1:

(a) Factors of 18 = 2 x 3 x 3
Factors of 48 = 2 x 2 x 2 x 2 x 3
H.C.F. (18, 48) = 2 x 3 = 6

(b) Factors of 30 = 2 x 3 x 5
Factors of 42 = 2 x 3 x 7
H.C.F. (30, 42) = 2 x 3 = 6

(c) Factors of 18 = 2 x 3 x 3
Factors of 60 = 2 x 2 x 3 x 5
H.C.F. (18, 60) = 2 x 3 = 6

(d) Factors of 27 = 3 x 3 x 3
Factors of 63 = 3 x 3 x 7
H.C.F. (27, 63) = 3 x 3 = 9

(e) Factors of 36 = 2 x 2 x 3 x 3
Factors of 84 = 2 x 2 x 3 x 7
H.C.F. (36, 84) = 2 x 2 x 3 = 12

(f) Factors of 34 = 2 x 17
Factors of 102 = 2 x 3 x 17
H.C.F. (34, 102) = 2 x 17 = 34

(g) Factors of 70 = 2 x 5 x 7
Factors of 105 = 3 x 5 x 7
Factors of 175 = 5 x 5 x 7
H.C.F. = 5 x 7 = 35

(h) Factors of 91 = 7 x 13
Factors of 112 = 2 x 2 x 2 x 2 x 7
Factors of 49 = 7 x 7
H.C.F. = 1 x 7 = 7

(i) Factors of 18 = 2 x 3 x 3
Factors of 54 = 2 x 3 x 3 x 3
Factors of 81 = 3 x 3 x 3 x 3
H.C.F. = 3 x 3 = 9

(j) Factors of 12 = 2 x 2 x 3
Factors of 45 = 3 x 3 x 5
Factors of 75 = 3 x 5 x 5
H.C.F. = 1 x 3 = 3

Question 2:

What is the H.C.F. of two consecutive:

(a) numbers?
(b) even numbers?
(c) odd numbers?

Answer 2:

(a) H.C.F. of two consecutive numbers be 1.
(b) H.C.F. of two consecutive even numbers be 2.
(c) H.C.F. of two consecutive odd numbers be 1.

Question 3:

H.C.F. of co-prime numbers 4 and 15 was found as follows by factorization:
4 = 2 x 2 and 15 = 3 x 5 since there is no common prime factor, so H.C.F. of 4 and 15 is 0.
Is the answer correct? If not, what is the correct H.C.F.?

Answer 3:

No. The correct H.C.F. is 1.

Exercise 3.7

Question 1:

Renu purchases two bags of fertilizer of weights 75 kg and 69 kg. Find the maximum value of weight which can measure the weight of the fertilizer exact number of times.

Answer 1:

For finding maximum weight, we have to find H.C.F. of 75 and 69.

Factors of 75 = 3 x 5 x 5

Factors of 69 = 3 x 69

H.C.F. = 3

Therefore the required weight is 3 kg.

Question 2:

Three boys step off together from the same spot. Their steps measure 63 cm, 70 cm and 77 cm respectively. What is the maximum distance each should cover so that all can cover the distance in complete steps?

Answer 2:

For finding minimum distance, we have to find L.C.M of 63, 70 and 77.

L.C.M. of 63, 70 and 77 = 7 x 9 x 10 x 11 = 6930 cm.

Therefore, the minimum distance is 6930 cm.

7	**63, 70, 77**
9	9, 10, 11
10	1, 10, 11
11	1, 1, 11
	1, 1, 1

Question 3:

The length, breadth and height of a room are 825 cm, 675 cm and 450 cm respectively. Find the longest tape which can measure the three dimensions of the room exactly.

Answer 3:

The measurement of longest tape = H.C.F. of 825 cm, 675 cm and 450 cm.

Factors of 825 = 3 x 5 x 5 x 11

Factors of 675 = 3 x 5 x 5 x 3 x 3

Factors of 450 = 2 x 3 x 3 x 5 x 5

H.C.F. = 3 x 5 x 5 = 75 cm

Therefore, the longest tape is 75 cm.

Question 4:

Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.

Answer 4:

L.C.M. of 6, 8 and 12 = 2 x 2 x 2 x 3 = 24

The smallest 3-digit number = 100

To find the number, we have to divide 100 by 24

100 = 24 x 4 + 4

Therefore, the required number = 100 + (24 – 4) = 120.

2	**6, 8, 12**
2	3, 4, 6
2	3, 2, 3
3	3, 1, 3
	1, 1, 1

Question 5:

Determine the largest 3-digit number which is exactly divisible by 8, 10 and 12.

Answer 5:

L.C.M. of 8, 10, 12 = 2 x 2 x 2 x 3 x 5 = 120

The largest three digit number = 999

Now,

$$\begin{array}{r} 8 \\ 120\overline{)\ 999} \\ -960 \\ \hline 39 \end{array}$$

Therefore, the required number = 999 – 39 = 960

2	**8, 10, 12**
2	4, 5, 6
2	2, 5, 3
3	1, 5, 3
5	1, 5, 1
	1, 1, 1

Question 6:

The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they change simultaneously at 7 a.m. at what time will they change simultaneously again?

Answer 6:

L.C.M. of 48, 72, 108 = 2 x 2 x 2 x 2 x 3 x 3 x 3 = 432 sec.

After 432 seconds, the lights change simultaneously.

432 second = 7 minutes 12 seconds

Therefore the time = 7 a.m. + 7 minutes 12 seconds

= 7:07:12 a.m.

2	**48, 72, 108**
2	24, 36, 54
2	12, 18, 27
2	6, 9, 27
3	3, 9, 27
3	1, 3, 9
3	1, 1, 3
	1, 1, 1

Question 7:

Three tankers contain 403 litres and 465 litres of diesel respectively. Find the maximum capacity of a container that can measure the diesel of three containers exact number of times.

Answer 7:

The maximum capacity of container = H.C.F. (403, 434, 465)
Factors of 403 = 13 x 31
Factors of 434 = 2 x 7 x 31
Factors of 465 = 3 x 5 x 31
H.C.F. = 31
Therefore, 31 litres of container is required to measure the quantity.

Question 8:

Find the least number which when divided by 6, 15 and 18, leave remainder 5 in each case.

Answer 8:

L.C.M. of 6, 15 and 18 = 2 x 3 x 3 x 5 = 90
Therefore, the required number = 90 + 5 = 95

2	**6, 15, 18**
3	3, 15, 9
3	1, 5, 3
5	1, 5, 1
	1, 1, 1

Question 9:

Find the smallest 4-digit number which is divisible by 18, 24 and 32.

Answer 9:

L.C.M. of 18, 24 and 32 = 2 x 2 x 2 x 2 x 2 x 3 x 3 = 288
The smallest four-digit number = 1000

Now,
$$\begin{array}{r} 3 \\ 288\overline{)\ 1000} \\ -864 \\ \hline 136 \end{array}$$

Therefore, the required number is 1000 + (288 – 136) = 1152.

2	**18, 24, 32**
2	9, 12, 16
2	9, 6, 8
2	9, 3, 4
2	9, 3, 2
3	9, 3, 1
3	3, 1, 1
	1, 1, 1

Question 10:

Find the L.C.M. of the following numbers:

(a) 9 and 4 (b) 12 and 5 (c) 6 and 5 (d) 15 and 4

Observe a common property in the obtained L.C.Ms. Is L.C.M. the product of two numbers in each case?

Answer 10:

(a) L.C.M. of 9 and 4

= 2 x 2 x 3 x 3

= 36

2	**9, 4**
2	9, 2
3	9, 1
3	3, 1
	1, 1

(b) L.C.M. of 12 and 5

= 2 x 2 x 3 x 5

= 60

2	**12, 5**
2	6, 5
3	3, 5
5	1, 5
	1, 1

(c) L.C.M. of 6 and 5

= 2 x 3 x 5

= 30

2	**6, 5**
3	3, 5
5	1, 5
	1, 1

(d) L.C.M. of 15 and 4

= 2 x 2 x 3 x 5

= 60

2	**15, 4**
2	15, 2
3	15, 1
5	5, 1
	1, 1

Yes, the L.C.M. is equal to the product of two numbers in each case.

And L.C.M. is also the multiple of 3.

Question 11:

Find the L.C.M. of the following numbers in which one number is the factor of other:

(a) 5, 20 (b) 6, 18 (c) 12, 48 (d) 9, 45

What do you observe in the result obtained?

Answer 11:

(a) L.C.M. of 5 and 20

= 2 x 2 x 5

= 20

2	**5, 20**
2	5, 10
5	5, 5
	1, 1

(b) L.C.M. of 6 and 18

= 2 x 3 x 3

= 18

2	**6, 18**
3	3, 9
3	1, 3
	1, 1

(c) L.C.M. of 12 and 48

= 2 x 2 x 2 x 2 x 3

= 48

2	**12, 48**
2	6, 24
2	3, 12
2	3, 6
3	3, 3
	1, 1

(d) L.C.M. of 9 and 45

= 3 x 3 x 5

= 45

3	**9, 45**
3	3, 15
5	1, 5
	1, 1

From these all cases, we can conclude that if the smallest number if the factor of largest number, then the L.C.M. of these two numbers is equal to that of larger number.

Mathematics

(Chapter – 4) (Basic Geometrical Ideas)

(Class – VI)

Exercise 4.1

Question 1:

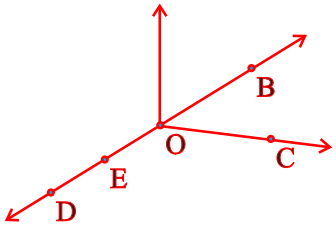
Use the figure to name:

(a) Five points

(b) A line

(c) Four rays

(d) Five line segments



Answer 1:

(a) Five points are: O, B, C, D, E

(b) A line: $\overline{DE}$, $\overline{DB}$, $\overline{OE}$, $\overline{OB}$

(c) Four rays: $\overrightarrow{OD}$, $\overrightarrow{OE}$, $\overrightarrow{OC}$, $\overrightarrow{OB}$

(d) Four line segments: $\overline{DE}$, $\overline{OE}$, $\overline{OC}$, $\overline{OB}$, , $\overline{OD}$

Question 2:

Name the line given in all possible (twelve) ways, choosing only two letters at a time from the four given.

Answer 2:

$\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BC}$, $\overline{BD}$, $\overline{CD}$, $\overline{BA}$, $\overline{CA}$, $\overline{DA}$, $\overline{CB}$, $\overline{DB}$, $\overline{DC}$

Question 3:

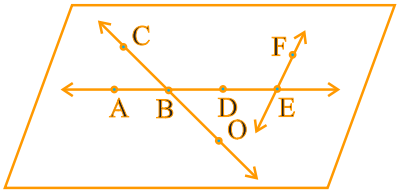
Use the figure to name:

(a) Line containing point E.

(b) Line passing through A.

(c) Line on which O lies.

(d) Two pairs of intersecting lines.



Answer 3:

(a) A line containing E = $\overline{AE}$ or $\overline{FE}$

(b) A line passing through A = $\overline{AE}$ or $\overline{DE}$

(c) A line on which O lies = $\overline{CO}$ or $\overline{OC}$

(d) Two pairs of intersecting lines are: $\overline{AD}$, $\overline{CO}$ and $\overline{AE}$, $\overline{FE}$

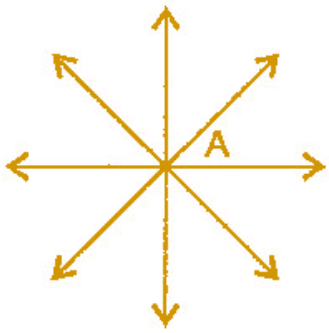
Question 4:

How many lines can pass though:

(a) one given point? (b) two given points

Answer 4:

(a) Infinite number of lines can pass through one given point.



(b) Only one line can pass through two given points.

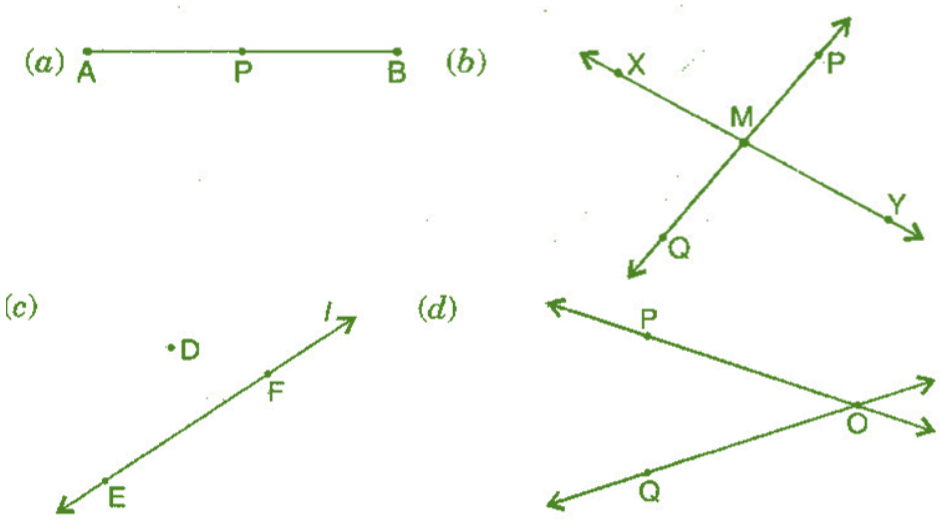
Question 5:

Draw a rough figure and label suitably in each of the following cases:

(a) Point P lies on $\overline{AB}$. (b) $\overline{XY}$ and $\overline{PQ}$ intersect at M.

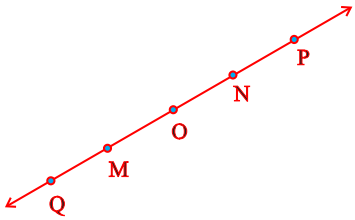
(c) Line l contains E and F but not D. (d) $\overline{OP}$ and $\overline{OQ}$ meet at O.

Answer 5:



Question 6:

Consider the following figure of line $\overline{MN}$. Say whether following statements are true or false in the context of the given figure:



(a) Q, M, O, N, P are points on the line $\overline{MN}$.

(b) M, O, N are points on a line segment $\overline{MN}$.

(c) M and N are end points of line segment $\overline{MN}$.

(d) O and N are end points of line segment $\overline{OP}$.

(e) M is one of the end points of line segment $\overline{QO}$.

(f) M is point on ray $\overrightarrow{OP}$.

(g) Ray $\overrightarrow{OP}$ is different from ray $\overrightarrow{OP}$.

(h) Ray $\overrightarrow{OP}$ same as ray $\overrightarrow{OM}$..

(i) Ray $\overrightarrow{OM}$. is not opposite to ray $\overrightarrow{OP}$.

(j) O is not an initial point of $\overline{NP}$ and $\overline{NM}$.

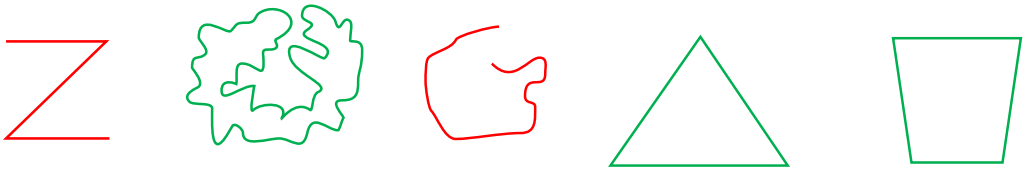
Answer 6:

(a) True
(b) True
(c) True
(d) False
(e) False
(f) False
(g) True
(h) False
(i) False
(j) False
(k) True

Exercise 4.2

Question 1:

Classify the following curves as (i) Open or (ii) Closed.



Answer 1:

(a) Open curve
(b) Closed curve
(c) Open curve
(d) Closed curve
(e) Closed curve

Question 2:

Draw rough diagrams to illustrate the following:

(a) Open curve
(b) Closed curve

Answer 2:

(a) Open curves:

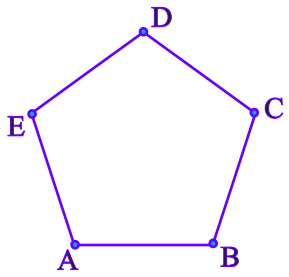
(b) Closed curves

Question 3:

Draw any polygon and shade its interior.

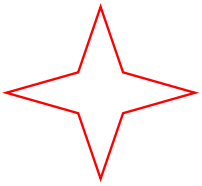
Answer 3:

Polygon ABCDE



Question 4:

Consider the given figure and answer the questions:



(a) Is it a curve?

(b) Is it closed?

Answer 4:

(a) Yes, it is a curve.

(b) Yes, it is closed.

Question 5:

Illustrate, if possible, each one of the following with a rough diagram:

(a) A closed curve that is not a polygon.

(b) An open curve made up entirely of line segments.

(c) A polygon with two sides.

Answer 5:

(a)

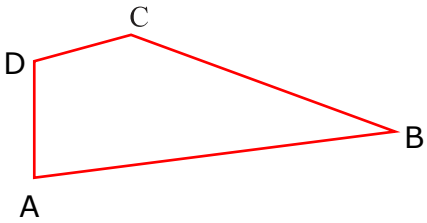
(b)

(c) Polygon with two sides cannot be draw.

Exercise 4.3

Question 1:

Name the angles in the given figure:



Answer 1:

There are four angles in given figure:

$\angle ABC$, $\angle CDA$, $\angle DAB$, $\angle DCB$

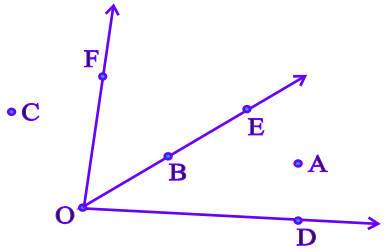
Question 2:

In the given diagram, name the point(s):

(a) In the interior of $\angle DOE$.

(b) In the exterior of $\angle EOF$.

(c) On $\angle EOF$.



Answer 2:

(a) Point interior of $\angle DOE$: A

(b) Points exterior of $\angle EOF$: C, A, D

(c) Points on $\angle EOF$: E, O, B, F

Question 3:

Draw rough diagrams of two angles such that they have:

(a) One point in common.

(b) Two points in common.

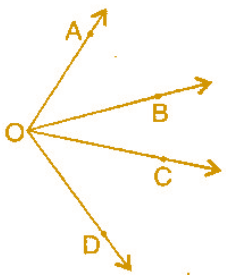
(c) Three points in common.

(d) Four points in common.

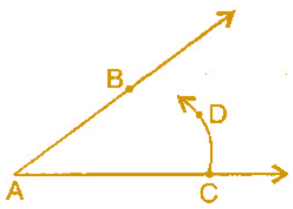
(e) One ray in common.

Answer 3:

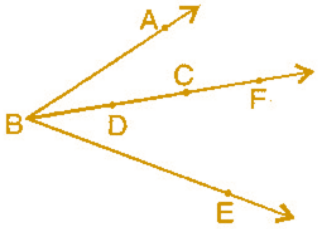
(a)



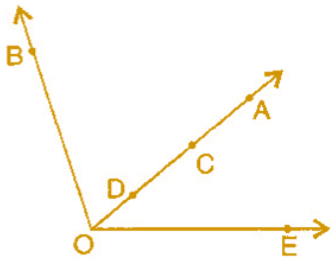
(b)



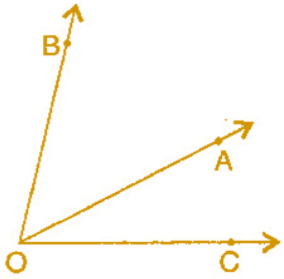
(c)



(d)



(e)

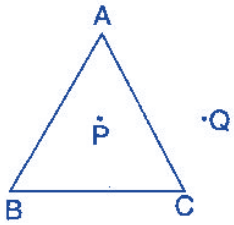


Exercise 4.4

Question 1:

Draw a rough sketch of a triangle ABC. Mark a point P in its interior and a point Q in its exterior. Is the point A in its exterior or in its interior?

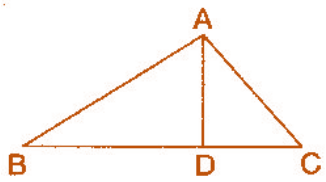
Answer 1:



A is neither interior of the figure nor exterior of triangle. It is a vertex.

Question 2:

(a) Identify three triangles in the figure:
(b) Write the names of seven angles.
(c) Write the names of sic line segments.
(d) Which two triangles have $\angle B$ as common?



Answer 2:

(a) The three triangles are: ΔABC, ΔABD, ΔADC

(b) Angles are: $\angle ADB$, $\angle ADC$, $\angle ABD$, $\angle ACD$, $\angle BAD$, $\angle CAD$, $\angle BAC$

(c) Line segments are: $\overline{AB}$, $\overline{AC}$, $\overline{AD}$, $\overline{BD}$, $\overline{DC}$, $\overline{BC}$

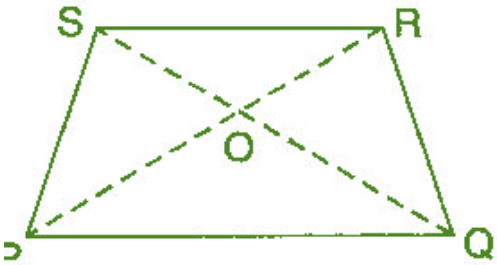
(d) Triangles having common $\angle B$: ΔABC, ΔABD,

Exercise 4.5

Question 1:

Draw a rough sketch of a quadrilateral PQRS. Draw its diagonals. Name them. Is the meeting point of the diagonals in the interior or exterior of the quadrilateral?

Answer 1:



Diagonal PR and diagonal SQ meet at O, which is inside the quadrilateral.

Question 2:

Draw a rough sketch of a quadrilateral KLMN. State:

(a) Two pairs of opposite sides.

(b) Two pairs of opposite angles.

(c) Two pairs of adjacent sides.

(d) Two pairs of adjacent angles.

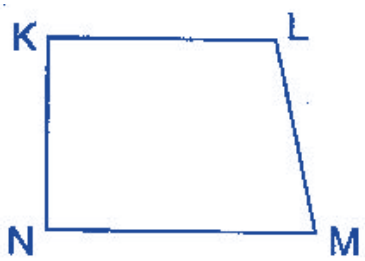
Answer 2:

(a) Pair of opposite sides : KL and MN, KN and LM

(b) Pair of opposite angles : $\angle$K and $\angle$M, $\angle$L and $\angle$N

(c) Pair of adjacent sides : KN and NM, KL and LM

(d) Pair of adjacent angles : $\angle$K and $\angle$N, $\angle$L and $\angle$M



Question 3:

Investigate:

Use strip and fasteners to make a triangle and a quadrilateral.

Try to push inward at any one vertex of the triangle. Do the same to the quadrilateral.

Is the triangle distorted? Is the quadrilateral distorted? Is the triangle rigid?

Why is it that structures like electric towers make use of triangular shapes and not quadrilateral?

Answer 3:

O is common to both the angles $\angle AOC$ and $\angle BOC$.

No, the triangle is not distorted but the quadrilateral is distorted and also the triangle is rigid.

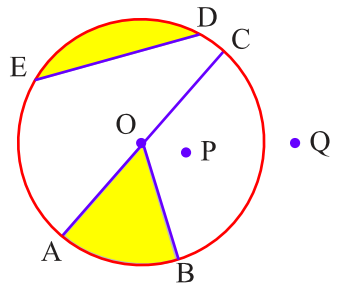
Structures like electric towers make use of triangular shape so that they could not be distorted and they could be rigid.

Exercise 4.6

Question 1:

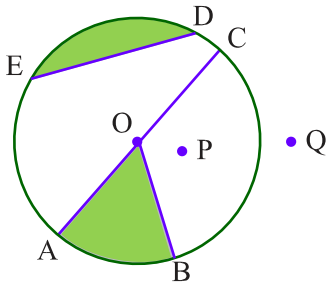
From the figure, identify:

(a) The centre of circle.
(b) Three radii.
(c) A diameter.
(d) A chord.
(e) Two points in the interior.
(f) A point in the exterior.
(g) A sector.
(h) A segment.



Answer 1:

(a) O is the centre.
(b) Three radii: OA, OB and OC
(c) A diameter: AC
(d) A chord: ED
(e) Interior points: O, P
(f) Exterior point: Q
(g) A sector: OAB
(h) A segment: ED



Question 2:

(a) Is every diameter of a circle also a chord?
(b) Is every chord of a circle also a diameter?

Answer 2:

(a) Yes, every diameter of a circle is also a chord.
(b) No, every chord of a circle is not a diameter.

Question 3:

Draw any circle and mark:

(a) Its centre.
(b) A radius.
(c) A diameter.
(d) A sector.

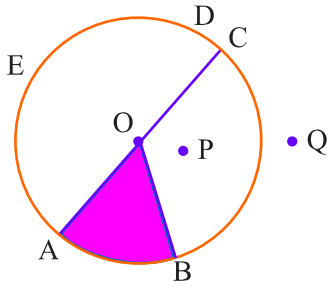
Answer 3:

(a) Its centre is O.

(b) A radius is OB.

(c) A diameter is AC.

(d) A sector OAB.



Question 4:

Say true or false:

(a) Two diameters of a circle will necessarily intersect.

(b) The centre of a circle is always in its interior.

Answer 4:

(a) True

(b) True

Mathematics

(Chapter – 5) (Understanding Elementary Shapes)

(Class – VI)

Exercise 5.1

Question 1:

What is the disadvantage in comparing line segments by mere observation?

Answer 1:

There may be chance of error due to improper viewing.

Question 2:

Why is it better to use a divider than a ruler, while measuring the length of a line segment?

Answer 2:

It is better to use a divider than a ruler, because the thickness of the ruler may cause difficulties in reading off her length. However divider gives up accurate measurement.

Question 3:

Draw any line segment, say $\overline{AB}$. Take any point C lying in between A and B. Measure the lengths of AB, BC and AC. Is AB = AC + CB?

[Note: If A, B, C are any three points on a line, such that AC + CB = AB, then we can be sure that C lies between A and B.]

Answer 3:

Yes.

AB = 6.5 cm, AC = 3cm, CB = 3.5 cm

AC + CB = 3 cm + 3.5 cm = 6.5 cm = AB

Question 4:

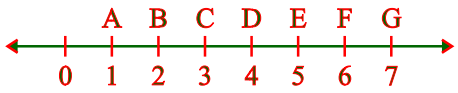
If A, B, C are three points on a line such that AB = 5 cm, BC = 3cm and AC = 8 cm, which one of them lies between the other two?

Answer 4:

$\overline{AC}$ is the longest line segment, thus B is the point between A and C.

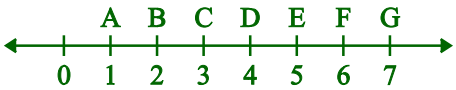
Question 5:

Verify whether D is the mid-point of $\overline{AG}$.



Answer 5:

AD = 3 units, DG = 3 units



AD = DG.

Thus, D is the mid-point.

Question 6:

If B is the mid-point of $\overline{AC}$ and C is the mid-point of $\overline{BD}$, where A, B, C, D lie on a straight line, say why AB = CD?

Answer 6:

B is the mid-point of $\overline{AC}$.

$\therefore$ AB = BC ... (i)

And C is the mid-point of $\overline{BD}$.

$\therefore$ BC = CD ... (ii)

From equation (i) and (ii), we get

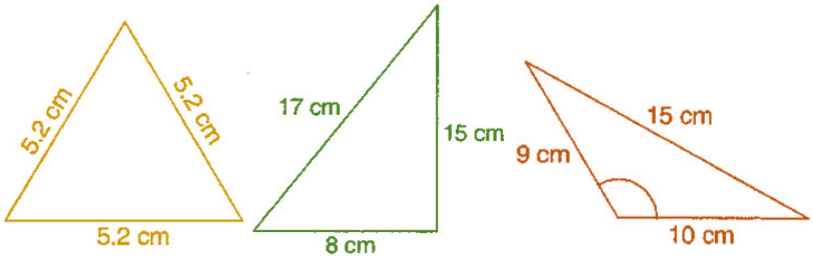
AB = CD

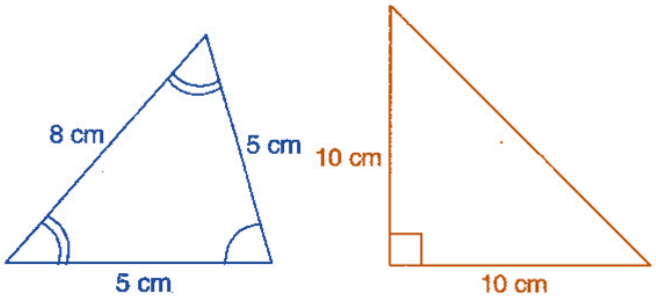
Question 7:

Draw five triangles and measure their sides. Check in each case, of the sum of the lengths of any two sides is always less than the third side.

Answer 7:

Yes, sum of two sides of a triangle is always greater than the third side.




8 cm
5 cm
5 cm
10 cm
10 cm

Exercise 5.2

Question 1:

What fraction of a clockwise revolution does the hour hand of a clock turn through, when it goes from

(a) 3 to 9 (b) 4 to 7 (c) 7 to 10

(d) 12 to 9 (e) 1 to 10 (f) 6 to 3

Answer 1:

(a) $\frac{1}{2}$ or two right angles

(b) $\frac{1}{4}$ or one right angle

(c) $\frac{1}{4}$ or one right angle

(d) $\frac{3}{4}$ or three right angles.

(e) $\frac{3}{4}$ or three right angles.

(f) $\frac{3}{4}$ or three right angles.

Question 2:

Where will the hand of a clock stop if it:

(a) starts at 12 and make $\frac{1}{2}$ of a revolution, clockwise?

(b) starts at 2 and makes $\frac{1}{2}$ of a revolution, clockwise?

(c) starts at 5 and makes $\frac{1}{4}$ of a revolution, clockwise?

(d) starts at 5 and makes $\frac{3}{4}$ of a revolution, clockwise?

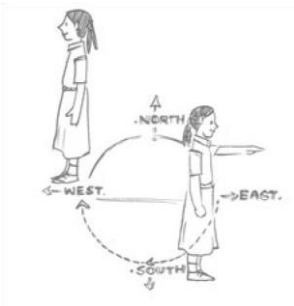
Answer 2:

(a) At 6 (b) At 8

(c) At 8 (d) At 2

Question 3:

Which direction will you face if you start facing:



(a) East and make $\frac{1}{2}$ of a revolution clockwise?

(b) East and make $1\frac{1}{2}$ of a revolution clockwise?

(c) West and makes $\frac{3}{4}$ of a revolution, clockwise?

(d) South and make one full revolution?

(Should we specify clockwise or anti-clockwise for this last question? Why not?)

Answer 3:

(a) West (b) West (c) North (d) South

(For answer (d), it is immaterial whether we turn clockwise or anticlockwise, because one full revolution will bring us back to the original position)

Question 4:

What part of a revolution have you turned through if you stand facing:

(a) East and turn clockwise to face north?

(b) South and turn clockwise to face east?

(c) West and turn clockwise to face east?

Answer 4:

(a) $\frac{3}{4}$ (b) $\frac{3}{4}$ (c) $\frac{1}{2}$

Question 5:

Find the number of right angles turned through by the hour hand of a clock when it goes from:

(a) 3 to 6

(b) 2 to 8

(c) 5 to 11

(d) 10 to 1

(e) 12 to 9

(f) 12 to 6

Answer 5:

(a) One right angle
(b) Two right angles
(c) Two right angles
(d) One right angle
(e) Three right angles
(f) Two right angles

Question 6:

How many right angles do you make if you start facing:

(a) South and turn clockwise to west?
(b) North and turn anti-clockwise to east?
(c) West and turn to west?
(d) South and turn to north?

Answer 6:

(a) One right angle
(b) Three right angles
(c) Four right angles
(d) Two right angles

Question 7:

Where will the hour hand of a clock stop if it starts:

(a) from 6 and turns through 1 right angle?
(b) from 8 and turns through 2 right angles?
(c) from 10 and turns through 3 right angles?
(d) from 7 and turns through 2 straight angles?

Answer 7:

(a) At 9
(b) At 2
(c) At 7
(d) At 7

Exercise 5.3

Question 1:

Match the following:

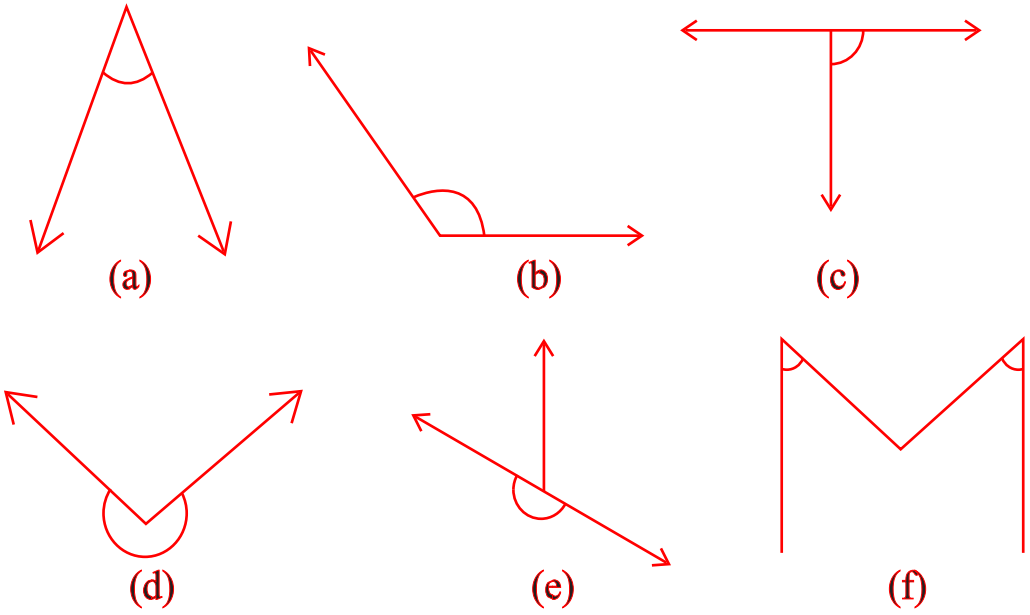
(i)	Straight angle	(a) less than one-fourth a revolution
(ii)	Right angle	(b) more than half a revolution
(iii)	Acute angle	(c) half of a revolution
(iv)	Obtuse angle	(d) one-fourth a revolution
(v)	Reflex angle	(e) between $\frac{1}{4}$ and $\frac{1}{2}$ of a revolution
		(f) one complete revolution

Answer 1:

(i) → (c)
(ii) → (d)
(iii) → (a)
(iv) → (e)
(v) → (b)

Question 2:

Classify each one of the following angles as right, straight, acute, obtuse or reflex:



Answer 2:

(a) Acute angle
(b) Obtuse angle
(c) Right angle
(d) Reflex angle
(e) Straight angle
(f) Acute angle

Exercise 5.4

Question 1:

What is the measure of (i) a right angle? (ii) a straight angle?

Answer 1:

(i) 90°

(ii) 180°

Question 2:

Say True or False:

(a) The measure of an acute angle < 90°.

(b) The measure of an obtuse angle < 90°.

(c) The measure of a reflex angle > 180°.

(d) The measure of on complete revolution = 360°.

(e) If $m\angle A = 53°$ and $m\angle B = 35°$, then $m\angle A > m\angle B$.

Answer 2:

(a) True

(b) False

(c) True

(d) True

(e) True

Question 3:

Write down the measure of:

(a) some acute angles (give at least two examples of each)

(b) some obtuse angles

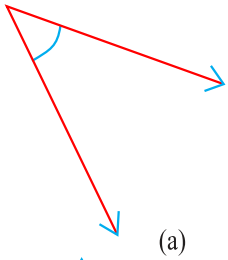
Answer 3:

(a) 35°, 20°

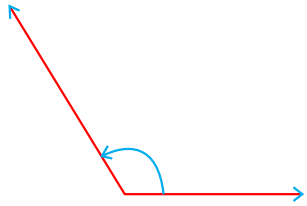
(b) 110°, 135°

Question 4:

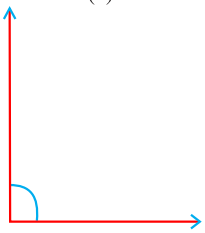
Measure the angles given below, using the protractor and write down the measure:



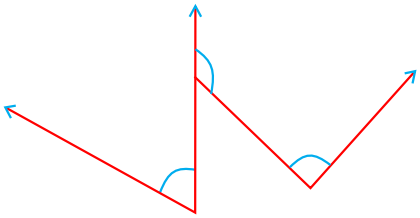
(a)



(b)



(c)



(d)

Answer 4:

(a) 40°

(b) 130°

(c) 90°

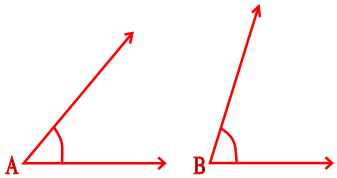
(d) 60°

Question 5:

Which angle has a large measure? First estimate and then measure:

Measure of angle A =

Measure of angle B =



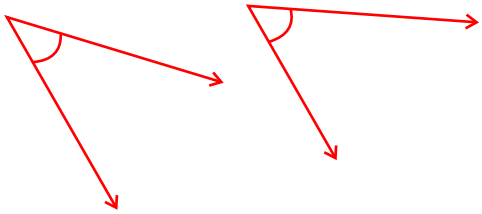
Answer 5:

$\angle$ B has larger measure.

$\angle$ A = 40° and $\angle$ B = 65°

Question 6:

From these two angles which has larger measure? Estimate and then confirm by measuring them:



Answer 6:

Second angle has larger measure.

Question 7:

Fill in the blanks with acute, obtuse, right or straight:

(a) An angle whose measure is less than that of a right angle is _____.

(b) An angle whose measure is greater than that of a right angle is _____.

(c) An angle whose measure is the sum of the measures of two right angles is _____.

(d) When the sum of the measures of two angles is that of a right angle, then each one of them is _____.

(e) When the sum of the measures of two angles is that of a straight angle and if one of them is acute then the other should be _____.

Answer 7:

(a) acute angle

(b) obtuse angle

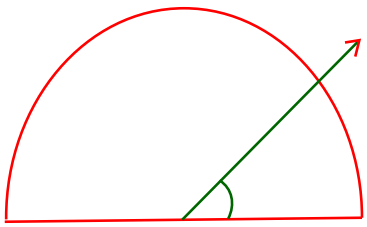
(c) straight angle

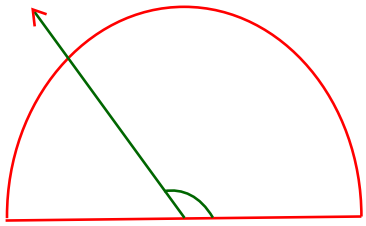
(d) acute angle

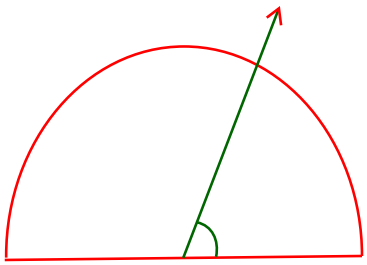
(e) obtuse angle

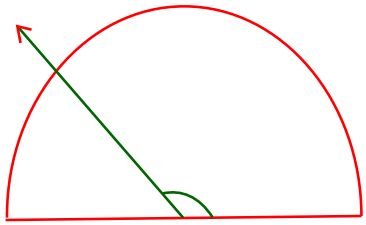
Question 8:

Find the measure of the angle shown in each figure. (First estimate with your eyes and then find the actual measure with a protractor).









Answer 8:

(i) 30°

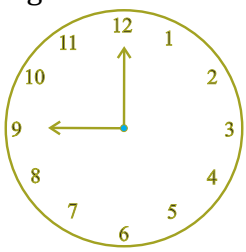
(ii) 120°

(iii) 60°

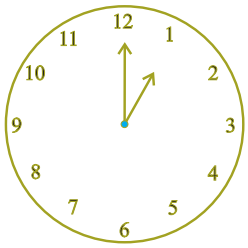
(iv) 150°

Question 9:

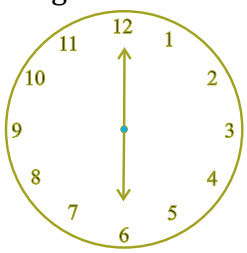
Find the angle measure between the hands of the clock in each figure:



9.00 a.m.



1.00 p.m.



6.00 p.m.

Answer 9:

(i) 90° (Right angle)

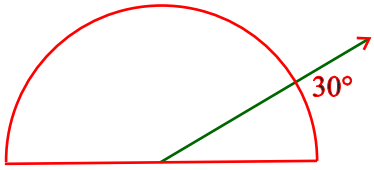
(ii) 30° (Acute angle)

(iii) 180° (Straight angle)

Question 10:

Investigate:

In the given figure, the angle measure 30°. Look at the same figure through a magnifying glass. Does the angle becomes larger? Does the size of the angle change?

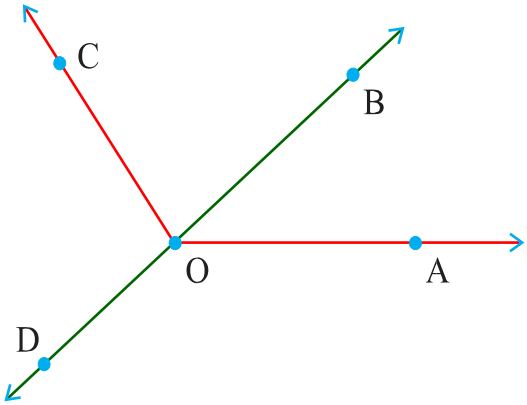


Answer 10:

No, the measure of angle will be same.

Question 11:

Measure and classify each angle:



Angle	Measure	Type
∠AOB		
∠AOC		
∠BOC		
∠DOC		
∠DOA		
∠DOB		

Answer 11:

Angle	∠ AOB	∠ AOC	∠ BOC	∠ DOC	∠ DOA	∠ DOB
Measure	40°	130°	90°	90°	140°	180°
Type	Acute	Obtuse	Right	Right	Obtuse	Straight

Exercise 5.5

Question 1:

Which of the following are models for perpendicular lines:

(a) The adjacent edges of a table top.

(b) The lines of a railway track.

(c) The line segments forming the letter 'L'.

(d) The letter V.

Answer 1:

(a) Perpendicular

(b) Not perpendicular

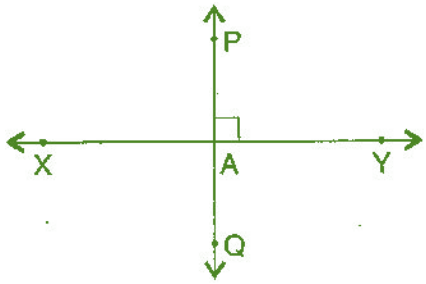
(c) Perpendicular

(d) Not perpendicular

Question 2:

Let $\overline{PQ}$ be the perpendicular to the line segment $\overline{XY}$. Let $\overline{PQ}$ and $\overline{XY}$ intersect in the point A. What is the measure of $\angle PAY$?

Answer 2:



$\angle PAY = 90^\circ$

Question 3:

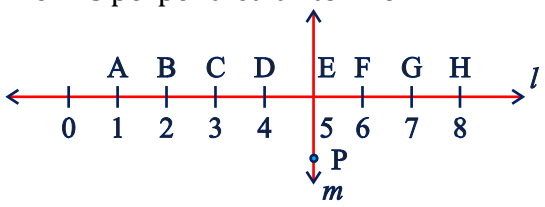
There are two "set-squares" in your box. What are the measures of the angles that are formed at their corners? Do they have any angle measure that is common?

Answer 3:

One set-square has $45^\circ, 90^\circ, 45^\circ$ and other set-square has $60^\circ, 90^\circ, 30^\circ$. They have 90° as common angle.

Question 4:

Study the diagram. The line l is perpendicular to line m.



(a) Is CE = EG?

(b) Does PE bisect CG?

(c) Identify any two line segments for which PE is the perpendicular bisector.

(d) Are these true? (i) AC > FG (ii) CD = GH (iii) BC < EH

Answer 4:

(a) Yes, both measure 2 units.

(b) Yes, because CE = EG

(c) $\overline{DF}$ and $\overline{CG}$, $\overline{BH}$

(d) (i) True, (ii) True, (iii) True

Exercise 5.6

Question 1:

Name the types of following triangles:

(a) Triangle with lengths of sides 7 cm, 8 cm and 9 cm.

(b) ΔABC with AB = 8.7 cm, AC = 7 cm and BC = 6 cm.

(c) ΔPQR such that PQ = QR = PR = 5 cm.

(d) ΔDEF with $m\angle D = 90^\circ$

(e) ΔXYZ with $m\angle Y = 90^\circ$ and XY = YZ

(f) ΔLMN with $m\angle L = 30^\circ$, $m\angle M = 70^\circ$ and $m\angle N = 80^\circ$.

Answer 1:

(a) Scalene triangle

(b) Scalene triangle

(c) Equilateral triangle

(d) Right-angled triangle

(e) Isosceles right-angled triangle

(f) Acute-angled triangle

Question 2:

Match the following:

	Measure of Triangle	**Types of Triangle**
(i)	3 sides of equal length	(a) Scalene
(ii)	2 sides of equal length	(b) Isosceles right angle
(iii)	All sides are of different length	(c) Obtuse angle
(iv)	3 acute angles	(d) Right angle
(v)	1 right angle	(e) Equilateral
(vi)	1 obtuse angle	(f) Acute angle
(vii)	1 right angle with two sides of equal length	(g) Isosceles

Answer 2:

(i) $\rightarrow$ (e), (ii) $\rightarrow$ (g),

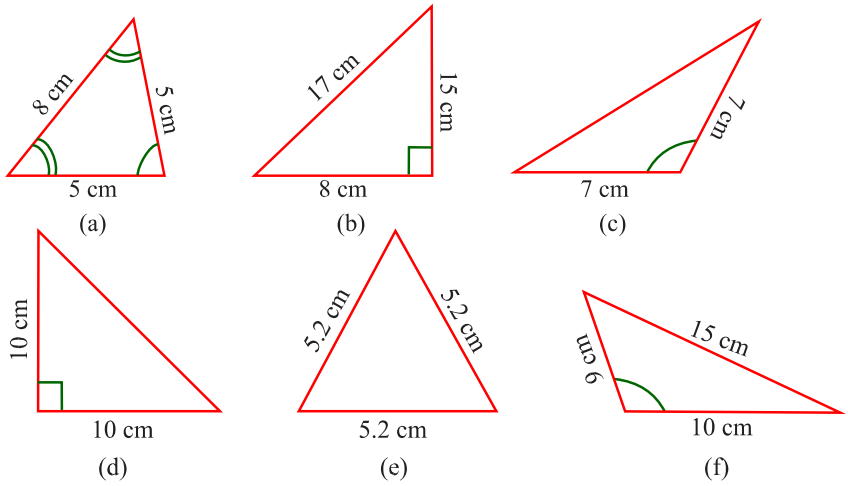
(iii) $\rightarrow$ (a), (iv) $\rightarrow$ (f),

(v) $\rightarrow$ (d), (vi) $\rightarrow$ (c),

(vii) $\rightarrow$ (b)

Question 3:

Name each of the following triangles in two different ways: (You may judge the nature of angle by observation)

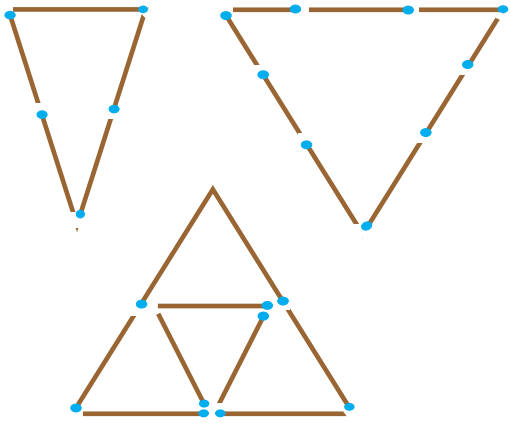


Answer 3:

(a) Acute angled triangle and Isosceles triangle
(b) Right-angled triangle and scalene triangle
(c) Obtuse-angled triangle and Isosceles triangle
(d) Right-angled triangle and Isosceles triangle
(e) Equilateral triangle and acute angled triangle
(f) Obtuse-angled triangle and scalene triangle

Question 4:

Try to construct triangles using match sticks. Some are shown here.



Can you make a triangle with:

(a) 3 matchsticks?
(b) 4 matchsticks?
(c) 5 matchsticks?
(d) 6 matchsticks?

(Remember you have to use all the available matchsticks in each case)

If you cannot make a triangle, think of reasons for it.

Answer 4:

(a) 3 matchsticks

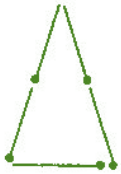
This is an acute angle triangle and it is possible with 3 matchsticks to make a triangle because sum of two sides is greater than third side.

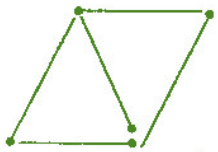
(b) 4 matchsticks

This is a square, hence with four matchsticks we cannot make triangle.

(c) 5 matchsticks

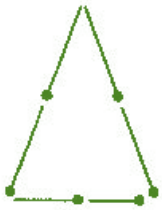
This is an acute angle triangle and it is possible to make triangle with five matchsticks, in this case sum of two sides is greater than third side.





(d) 6 matchsticks

This is an acute angle triangle and it is possible to make a triangle with the help of 6 matchsticks because sum of two sides is greater than third side.



Exercise 5.7

Question 1:

Say true or false:

(a) Each angle of a rectangle is a right angle.
(b) The opposite sides of a rectangle are equal in length.
(c) The diagonals of a square are perpendicular to one another.
(d) All the sides of a rhombus are of equal length.
(e) All the sides of a parallelogram are of equal length.
(f) The opposite sides of a trapezium are parallel.

Answer 1:

(a) True
(b) True
(c) True
(d) True
(e) False
(f) False

Question 2:

Give reasons for the following:

(a) A square can be thought of as a special rectangle.
(b) A rectangle can be thought of as a special parallelogram.
(c) A square can be thought of as a special rhombus.
(d) Squares, rectangles, parallelograms are all quadrilateral.
(e) Square is also a parallelogram.

Answer 2:

(a) Because its all angles are right angle and opposite sides are equal.
(b) Because its opposite sides are equal and parallel.
(c) Because its four sides are equal and diagonals are perpendicular to each other.
(d) Because all of them have four sides.
(e) Because its opposite sides are equal and parallel.

Question 3:

A figure is said to be regular if its sides are equal in length and angles are equal in measure. Can you identify the regular quadrilateral?

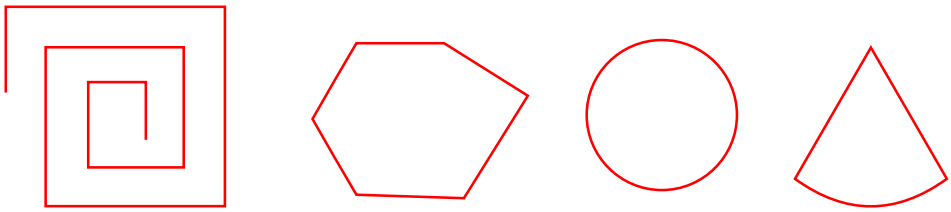
Answer 3:

A square is a regular quadrilateral.

Exercise 5.8

Question 1:

Examine whether the following are polygons. If anyone among these is not, say why?



(a) (b) (c) (d)

Answer 1:

(a) As it is not a closed figure, therefore, it is not a polygon.

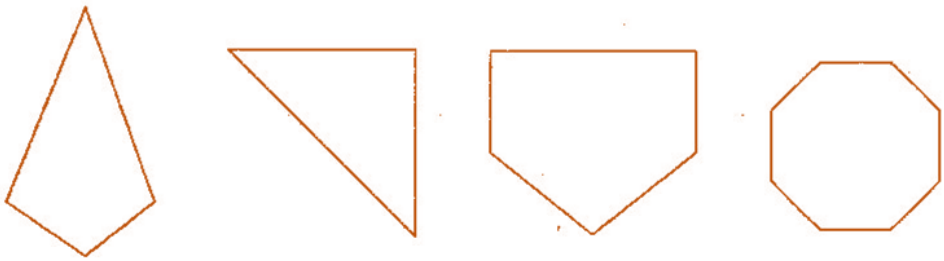
(b) It is a polygon because it is closed by line segments.

(c) It is not a polygon because it is not made by line segments.

(d) It is not a polygon because it not made only by line segments, it has curved surface also.

Question 2:

Name each polygon:



(a) (b) (c) (d)

Make two more examples of each of these.

Answer 2:

(a) Quadrilateral

(b) Triangle

(c) Pentagon

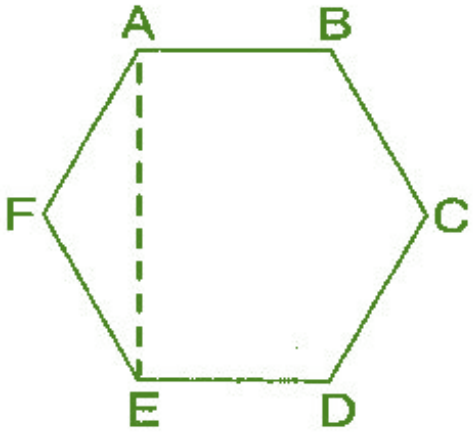
(d) Octagon

Question 3:

Draw a rough sketch of a regular hexagon. Connecting any three of its vertices, draw a triangle. Identify the type of the triangle you have drawn.

Answer 3:

ABCDEF is a regular hexagon and triangle thus formed by joining AEF is an isosceles triangle.

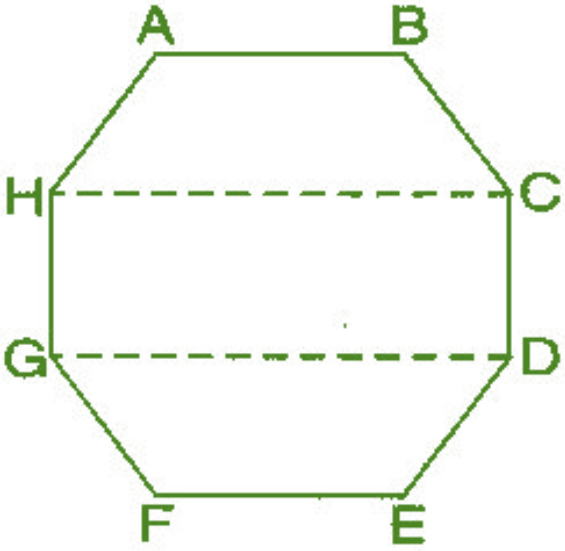


Question 4:

Draw a rough sketch of a regular hexagon. Connecting any three of its vertices, draw a triangle. Identify the type of the triangle you have drawn.

Answer 4:

ABCDEFGH is a regular octagon and CDGH is a rectangle.

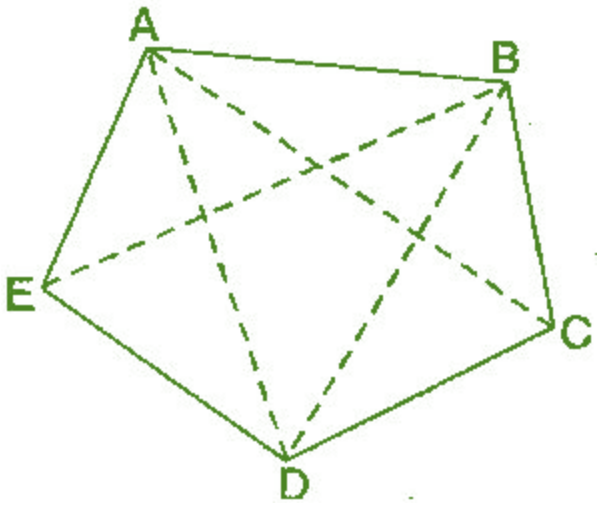


Question 5:

A diagonal is a line segment that joins any two vertices of the polygon and is not a side of the polygon. Draw a rough sketch of a pentagon and draw its diagonals.

Answer 5:

ABCDE is the required pentagon and its diagonals are AD, AC, BE and BD.



Exercise 5.9

Question 1:

Match the following:

(a) Cone

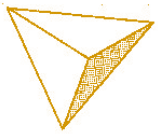
(b) Sphere

(c) Cylinder

(d) Cuboid

(e) Pyramid

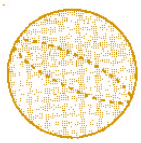
(i)



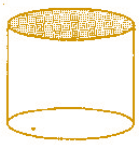
(ii)

(iii)

(iv)



(v)



Give two example of each shape.

Answer 1:

(a) Cone

(b) Sphere

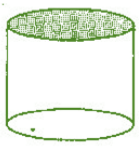
(c) Cylinder

(d) Cuboid

(ii)

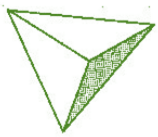
(iv)

(v)



(iii)

(e) Pyramid

(i) 

Question 2:

What shape is:

(a) Your instrument box?

(b) A brick?

(c) A match box?

(d) A road-roller?

(e) A sweet laddu?

Answer 2:

(a) Cuboid

(b) Cuboid

(c) Cuboid

(d) Cylinder

(e) Sphere

Mathematics

(Chapter – 6) (Integers)

(Class – VI)

Exercise 6.1

Question 1:

Write opposite of the following:

(a) Increase in weight
(b) 30 km north
(c) 326 BC
(d) Loss of ₹700
(e) 100 m above sea level

Answer 1:

(a) Decrease in weight
(b) 30 km south
(c) 326 AD
(d) Profit of ₹700
(e) 100 m below sea level

Question 2:

Represent the following numbers as integers with appropriate signs.

(a) An aeroplane is flying at a height two thousand meters above the ground.
(b) A submarine is moving at a depth eight thousand meters below the sea level.
(c) A deposit of rupees two hundred.
(d) Withdrawal of rupees seven hundred.

Answer 2:

(a) (+) 200 meters
(b) (–) 800 meters
(c) (+) 200 Rupees
(d) (–) 700 Rupees

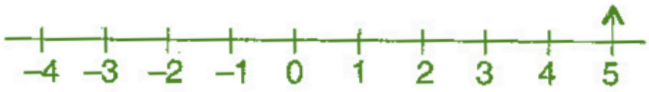
Question 3:

Represent the following numbers on number line:

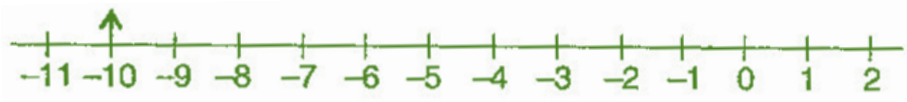
(a) +5
(b) –10
(c) +8
(d) –1
(e) –6

Answer 3:

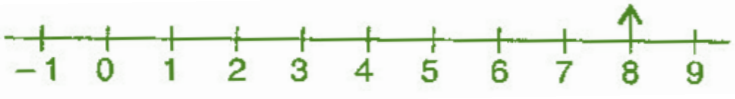
(a)



(b)

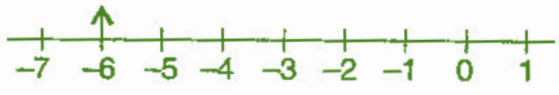


(c)



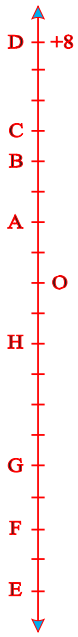
(d)

(e)



Question 4:

Adjacent figure is a vertical number line, representing integers. Observe it and locate the following points:



(a) If point D is +8 then which point is –8?
(b) Is point G a negative integer or a positive integer?
(c) Write integers for points B and E.
(d) Which point marked on this number line has the least value?
(e) Arrange all the points in decreasing order of values.

Answer 4:

(a) F
(b) Negative
(c) B = (+) 4; E = (–) 10
(d) E
(e) D, C, B, A, O, H, G, F, E

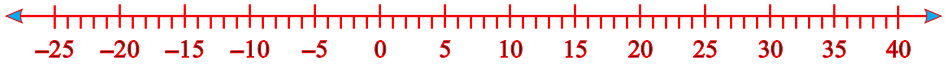
Question 5:

Following is the list of temperatures of five places in India, on a particular day of the year.

Place	**Temperature**	
Siachin	10°C below 0°C	_____
Shimla	2°C below 0°C	_____
Ahmedabad	30°C above 0°C	_____
Delhi	20°C above 0°C	_____
Srinagar	5°C below 0°C	_____

(a) Write the temperature of these places in the form of integers in the blank column.

(b) Following is the number line representing the temperature in degree Celsius.



Plot the name of the city against its temperature.

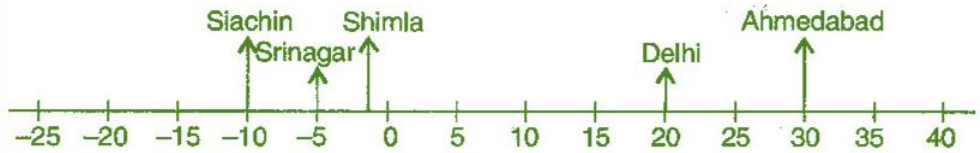
(c) Which is the coolest place?

(d) Write the names of the place where temperature are above 10°C.

Answer 5:

Place	Temperature
(a) Siachin	(–) 10°C
Shimla	(–) 2°C
Ahmedabad	(+) 30°C
Delhi	(+) 20°C
Srinagar	(–) 5°C

(b) Number line



(c) Siachin

(d) Ahemadabad, Delhi

Question 6:

In each of the following pairs, which number is to the right of the other on the number line?

(a) 2, 9

(b) –3, –8

(c) 0, –1

(d) –11, 10

(e) –6, 6

(f) 1, –100

Answer 6:

(a) 9 is right to 2

(b) –3 is right to –8

(c) 0 is right to –1

(d) 10 is right to –11

(e) 6 is right to –6

(f) 1 is right to –100

Question 7:

Write all the integers between the given pairs (write them in the increasing order):

(a) 0 and –7
(b) –4 and 4
(c) –8 and –15
(d) –30 and –23

Answer 7:

(a) –6, –5, –4, –3, –2, –1
(b) –3, –2, –1, 0, 1, 2, 3
(c) –14, –13, –12, –11, –10, –9
(d) –29, –28, –27, –26, –25, –24

Question 8:

(a) Write four negative integers greater than –20.
(b) Write four negative integers less than –10.

Answer 8:

(a) –19, –18, –17, –16
(b) –11, –12, –13, –14

Question 9:

For the following statements write True (T) or False (F). If the statement is false, correct the statement:

(a) –8 is to the right of –10 on a number line.
(b) –100 is the right of –50 on a number line.
(c) Smallest negative integer is –1.
(d) –26 is larger than –25.

Answer 9:

(a) True
(b) False
(c) False
(d) False

Question 10:

Draw a number line and answer the following:

(a) Draw a number line will we reach if we move 4 numbers to the right of –2.
(b) Which number will we reach if we move 5 numbers to the left of 1.
(c) If we are at –8 on the number line, in which direction should we move to reach –13?
(d) If we are at –6 on the number line, in which direction should we move to reach –1?

Answer 10:

(a)

(b)

(c) On left side

(d) On right side

Exercise 6.2

Question 1:

Using the number line write the integer which is:

(a) 3 more than 5

(b) 5 more than −5

(c) 6 less than 2

(d) 3 less than −2

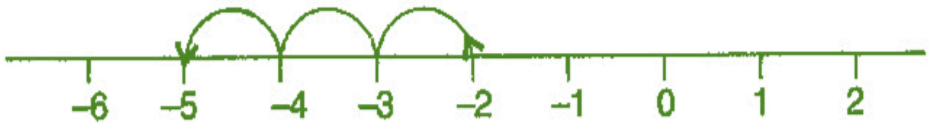
Answer 1:

(a) 8

(b) 0

(c) −4

(d) −5



Question 2:

Use number line and add the following integers:

(a) 9 + (−6)

(b) 5 + (−11)

(c) (−1) + (−7)

(d) (−5) + 10

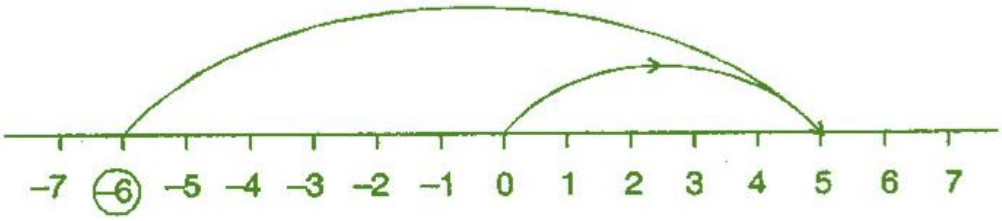
(e) (−1) + (−2) + (−3)

(f) (−2) + 8 + (−4)

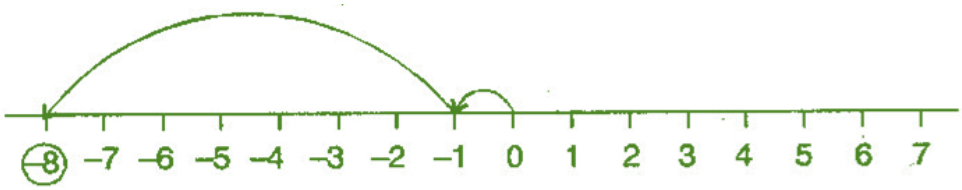
Answer 2:

(a) 9 + (−6) = 3

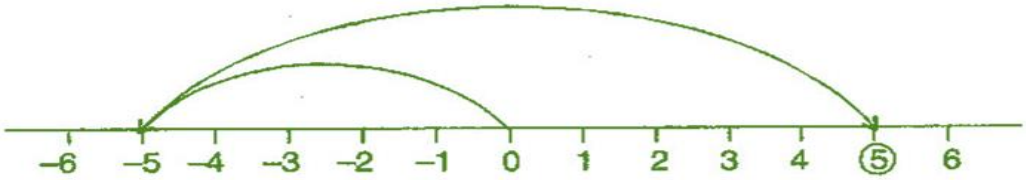
(b) 5 + (−11) = −6



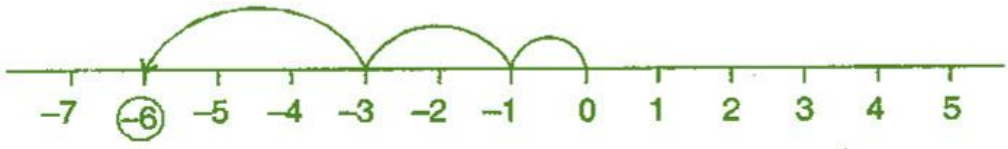
(c) (−1) + (−7) = −8



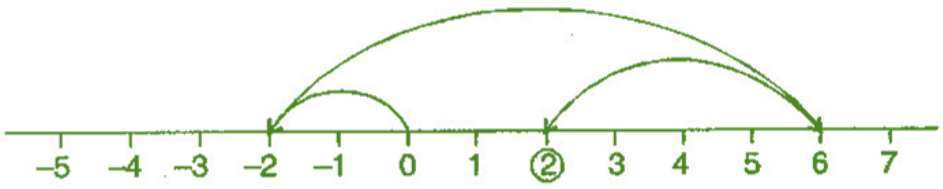
(d) (−5) + 10 = 5



(e) (−1) + (−2) + (−3) = −6



(f) (−2) + 8 + (−4) = 2



Question 3:

Add without using number line:

(a) 11 + (–7)
(b) (–13) + (+18)
(c) (–10) + (+19)
(d) (–250) + (+150)
(e) (–380) + (–270)
(f) (–217) + (–100)

Answer 3:

(a) 11 + (–7) = 11 – 7 = 4
(b) (–13) + 18 = 5
(c) (–10) + (+19) = –10 + 19 = 9
(d) (–250) + (+150) = –250 + 150 = –100
(e) (–380) + (–270) = –380 – 270 = –650
(f) (–217) + (–100) = –217 v 100 = –317

Question 4:

Find the sum of:

(a) 137 and –354
(b) –52 and 52
(c) –213, 39 and 192
(d) –50, –200 and 300

Answer 4:

(a) 137 + (–354) = 137 – 354 = –217
(b) (–52) + 52 = 0
(c) (–312) + 39 + 192 = –312 + 231 = –81
(d) (–50) + (–200) + 300 = –50 – 200 + 300 = –250 + 300 = 50

Question 5:

Find the value of:

(a) (–7) + (–9) + 4 + 16
(b) 37 + (–2) + (–65) + (–8)

Answer 5:

(a) (–7) + (–9) + 4 + 16
= –7 – 9 + 4 + 16
= –16 + 20
= 4

(b) 37 + (–2) + (–65) + (–8)
= 37 – 2 – 65 – 8
= 37 – 75
= –38

Exercise 6.3

Question 1:

Subtract:

(a) 35 – (20)
(b) 72 – (90)
(c) (–15) – (–18)
(d) (–20) – (13)
(e) 23 – (–12)
(f) (–32) – (–40)

Answer 1:

(a) 35 – 20 = 15
(b) 72 – 90 = –18
(c) (–15) – (–18) = –15 + 18 = 3
(d) –20 – (13) = –20 – 13 = –33
(e) 23 – (–12) = 23 + 12 = 35
(f) (–32) – (–40) = –32 + 40 = 8

Question 2:

Fill in the blanks with >, < or = sign:

(a) (–3) + (–6) _____ (–3) – (–6)
(b) (–21) – (–10) _____ (–31) + (–11)
(c) 45 – (–11) _____ 57 + (–4)
(d) (–25) – (–42) _____ (–42) – (–25)

Answer 2:

(a) (–3) + (–6) $\leq$ (–3) – (–6)
(b) (–21) – (–10) $\geq$ (–31) + (–11)
(c) 45 – (–11) $\geq$ 57 + (–4)
(d) (–25) – (–42) $\geq$ (–42) – (–25)

Question 3:

Fill in the blanks:

(a) (–8) + _____ = 0
(b) 13 + _____ = 0
(c) 12 + (–12) = _____
(d) (–4) + _____ = –12
(e) _____ – 15 = –10

Answer 3:

(a) (–8) + 8 = 0
(b) 13 + (–13) = 0
(c) 12 + (–12) = 0
(d) (–4) + (–8) = –12
(e) 5 – 15 = –10

Question 4:

Find:

(a) (−7) − 8 − (−25)

(b) (−13) + 32 − 8 − 1

(c) (−7) + (−8) + (−90)

(d) 50 − (−40) − (−2)

Answer 4:

(a) (−7) − 8 − (−25)

= −7 − 8 + 25

= −15 + 25

= 10

(b) (−13) + 32 − 8 − 1

= −13 + 32 − 8 − 1

= 32 − 22

= 10

(c) (−7) + (−8) + (−90)

= −7 − 8 − 90

= −105

(d) 50 − (−40) − (−2)

= 50 + 40 + 2

= 92

Mathematics

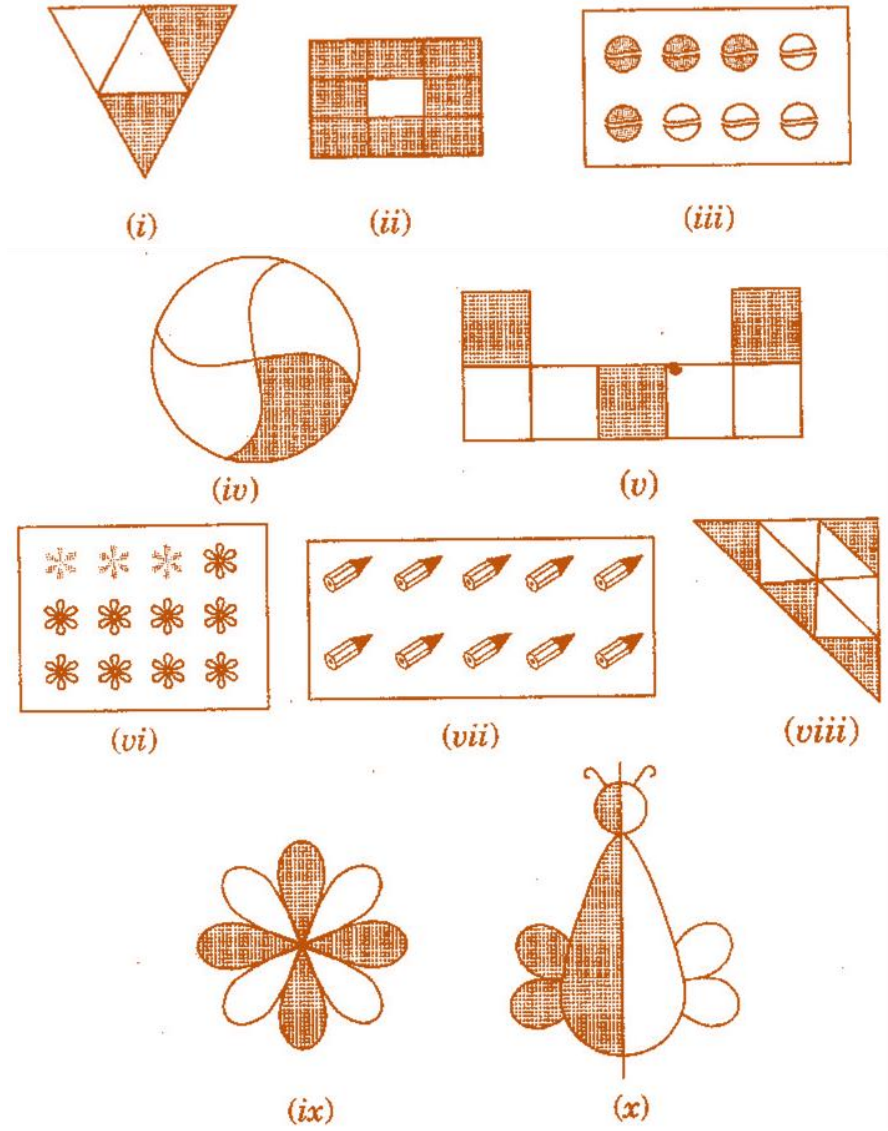
(Chapter – 7) (Fractions)

(Class – VI)

Exercise 7.1

Question 1:

Write the fraction representing the shaded portion:



Answer 1:

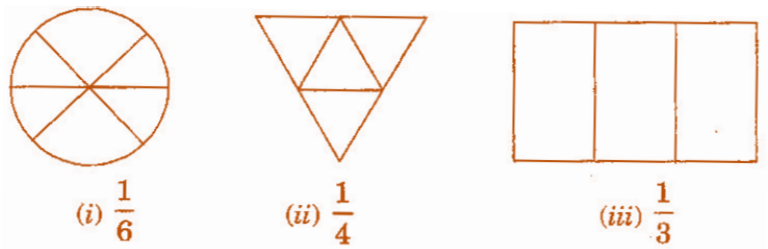
(i) $\frac{2}{4}$ (ii) $\frac{8}{9}$ (iii) $\frac{4}{8}$ (iv) $\frac{1}{4}$

(v) $\frac{3}{7}$ (vi) $\frac{3}{12}$ (vii) $\frac{10}{10}$ (viii) $\frac{4}{9}$

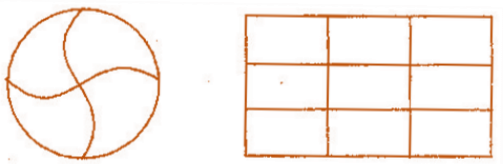
(ix) $\frac{4}{8}$ (x) $\frac{1}{2}$

Question 2:

Colour the part according to the given fraction:

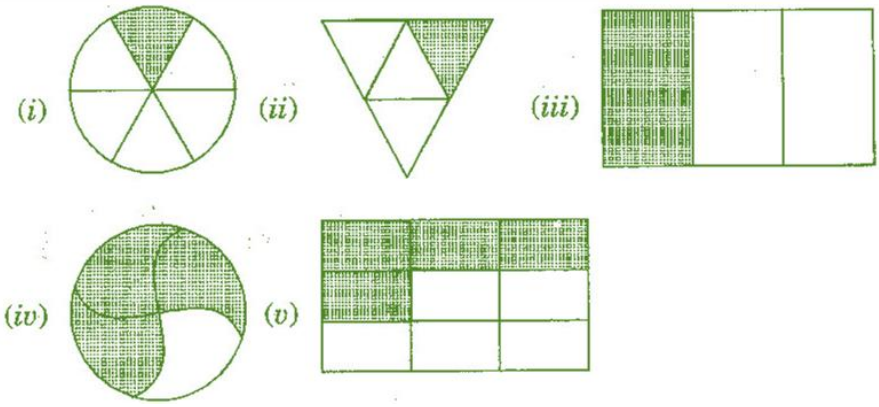


(i) $\frac{1}{6}$ (ii) $\frac{1}{4}$ (iii) $\frac{1}{3}$



(iv) $\frac{3}{4}$ (v) $\frac{4}{9}$

Answer 2:

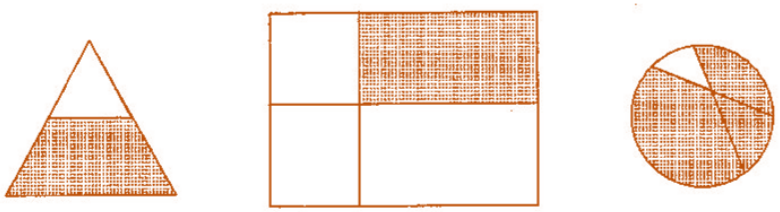


(i) (ii) (iii)

(iv) (v)

Question 3:

Identify the error, if any?



This is 1/2 This is 1/4 This is 3/4

Answer 3:

All the figures are not equally divided. For making fractions, it is necessary that figure is to be divided in equal parts.

Question 4:

What fraction of a day is 8 hours?

Answer 4:

Since, 1 day = 24 hours.

Therefore, the fraction of 8 hours = $\frac{8}{24} = \frac{1}{3}$

Question 5:

What fraction of an hour is 40 minutes?

Answer 5:

Since, 1 hour = 60 minutes.

Therefore, the fraction of 40 minutes = $\frac{40}{60} = \frac{2}{3}$

Question 6:

Arya, Abhimanyu and Vivek shared lunch. Arya has brought two sandwiches, one made of vegetable and one of jam. The other two boys forgot to bring their lunch. Arya agreed to share his sandwiches so that each person will have an equal share of each sandwich.

(a) How can Arya divide his sandwiches so that each person has an equal share?

(b) What part of a sandwich will each boy receive?

Answer 6:

(a) Arya will divide each sandwich into three equal parts and give one part of each sandwich to each one of them.

(b) $1 \times \frac{1}{3} = \frac{1}{3}$

Question 7:

Kanchan dyes dresses. She had to dye 30 dresses. She has so far finished 20 dresses. What fraction of dresses has she finished?

Answer 7:

Total number of dresses = 30

Work finished = 20

Fraction of finished work = $\frac{20}{30} = \frac{2}{3}$

Question 8:

Write the natural numbers from 2 to 12. What fraction of them are prime numbers?

Answer 8:

Natural numbers from 2 to 12: 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12

Prime numbers from 2 to 12: 2, 3, 5, 7, 11

Hence, fraction of prime numbers $= \frac{5}{11}$

Question 9:

Write the natural numbers from 102 to 113. What fraction of them are prime numbers?

Answer 9:

Natural numbers from 102 to 113:

102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113

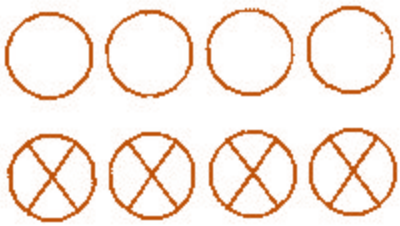
Prime numbers from 102 to 113:

103, 107, 109, 113

Hence fraction of prime numbers = $\frac{4}{12} = \frac{1}{3}$

Question 10:

What fraction of these circles have 'X's in them?



Answer 10:

Total number of circles = 8 and number of circles having 'X' = 4

Hence, the fraction = $\frac{4}{8}$

Question 11:

Kristin received a CD player for her birthday. She bought 3 CDs and received 5 others as gifts. What fraction of her total CDs did she buy and what fraction did she receive as gifts?

Answer 11:

Total number of CDs = 3 + 5 = 8

Number of CDs purchased = 3

Fraction of CDs purchased = $\frac{3}{8}$

Fraction of CDs received as gifts = $\frac{5}{8}$

Exercise 7.2

Question 1:

Draw number lines and locate the points on them:

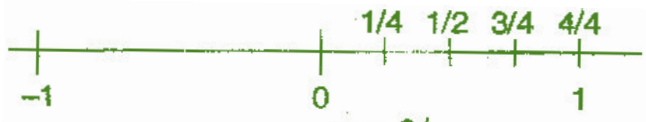
(a) $\frac{1}{2}, \frac{1}{4}, \frac{3}{4}, \frac{4}{4}$

(b) $\frac{1}{8}, \frac{2}{8}, \frac{3}{8}, \frac{7}{8}$

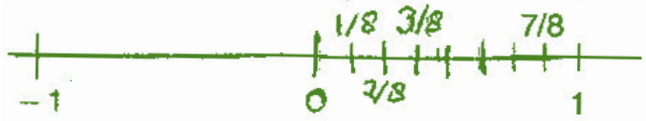
(c) $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$

Answer 1:

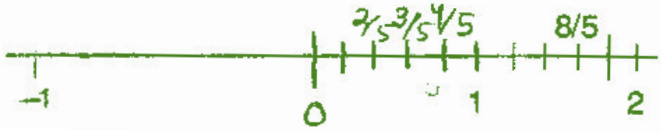
(a)



(b)



(c)



Question 2:

Express the following fractions as mixed fractions:

(a) $\frac{20}{3}$

(b) $\frac{11}{5}$

(c) $\frac{17}{7}$

(d) $\frac{28}{5}$

(e) $\frac{19}{6}$

(f) $\frac{35}{9}$

Answer 2:

(a)

$$3\overline{)\,20\,}$$ quotient 6

$$\begin{array}{r} 20 \\ -18 \\ \hline 2 \end{array}$$

$$\therefore \frac{20}{3} = 6\frac{2}{3}$$

(b)

$$5\overline{)\,11\,}$$ quotient 2

$$\begin{array}{r} 11 \\ -10 \\ \hline 1 \end{array}$$

$$\therefore \frac{11}{5} = 2\frac{1}{5}$$

(c)

$$7\overline{)\,17\,}$$ quotient 2

$$\begin{array}{r} 17 \\ -14 \\ \hline 3 \end{array}$$

$$\therefore \frac{17}{7} = 2\frac{3}{7}$$

(d)

$$5\overline{)\,28\,}$$ quotient 5

$$\begin{array}{r} 28 \\ -25 \\ \hline 3 \end{array}$$

$$\therefore \frac{28}{5} = 5\frac{3}{5}$$

(e)

$$6\overline{)\,19\,}$$ quotient 3

$$\begin{array}{r} 19 \\ -18 \\ \hline 1 \end{array}$$

$$\therefore \frac{19}{6} = 3\frac{1}{6}$$

(f)

$$9\overline{)\,35\,}$$ quotient 3

$$\begin{array}{r} 35 \\ -27 \\ \hline 8 \end{array}$$

$$\therefore \frac{35}{9} = 3\frac{8}{9}$$

Question 3:

Express the following as improper fractions:

(a) $7\frac{3}{4}$

(b) $5\frac{6}{7}$

(c) $2\frac{5}{6}$

(d) $10\frac{3}{5}$

(e) $9\frac{3}{7}$

(f) $8\frac{4}{9}$

Answer 3:

(a) $7\frac{3}{4}=\frac{(7\times4)+3}{4}=\frac{28+3}{4}=\frac{31}{4}$

(b) $5\frac{6}{7}=\frac{(5\times7)+6}{7}=\frac{35+6}{7}=\frac{41}{7}$

(c) $2\frac{5}{6}=\frac{(2\times6)+5}{6}=\frac{12+5}{6}=\frac{17}{6}$

(d) $10\frac{3}{5}=\frac{(10\times5)+3}{5}=\frac{50+3}{5}=\frac{53}{5}$

(e) $9\frac{3}{7}=\frac{(9\times7)+3}{7}=\frac{63+3}{7}=\frac{66}{7}$

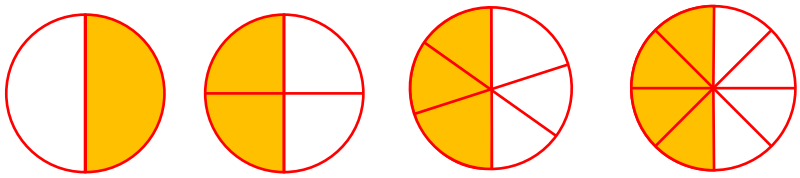
(f) $8\frac{4}{9}=\frac{(8\times9)+4}{9}=\frac{72+4}{9}=\frac{76}{9}$

Exercise 7.3

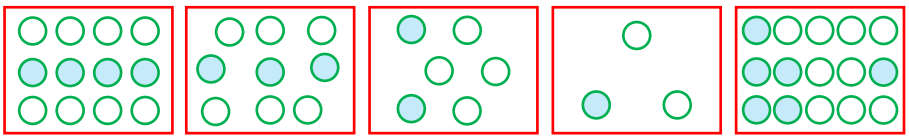
Question 1:

Write the fractions. Are all these fractions equivalent:

(a)



(b)



Answer 1:

(a) $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$

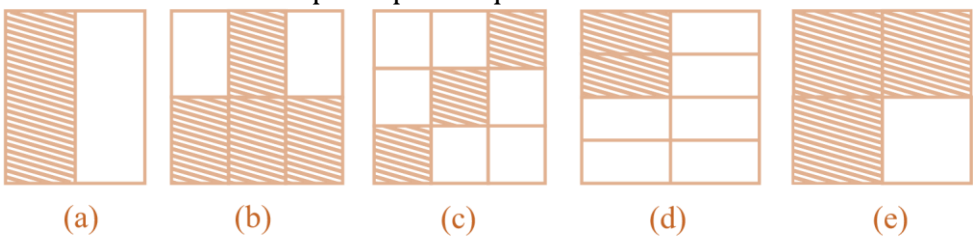
Yes, all of these fractions are equivalent.

(b) $\frac{4}{12}, \frac{3}{9}, \frac{2}{6}, \frac{1}{3}, \frac{6}{15}$

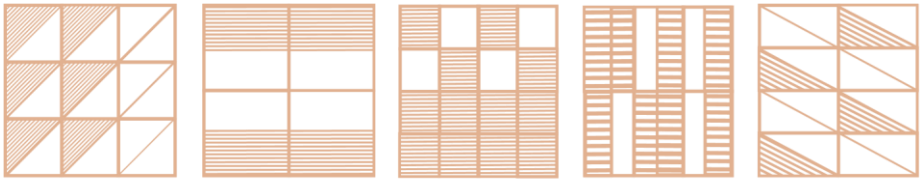
No, these fractions are not equivalent.

Question 2:

Write the fraction and pair up the equivalent fractions to each row:



(a) (b) (c) (d) (e)



(i) (ii) (iii) (iv) (v)

Answer 2:

(a) $\frac{1}{2}$

(b) $\frac{\cancel{4}}{\cancel{6}} = \frac{2}{3}$

(c) $\frac{\cancel{3}}{\cancel{9}} = \frac{1}{3}$

(d) $\frac{\cancel{2}}{\cancel{8}} = \frac{1}{4}$

(e) $\frac{3}{4}$

(ii) $\frac{\cancel{4}}{\cancel{8}} = \frac{1}{2}$

(iv) $\frac{\cancel{8}}{\cancel{12}} = \frac{2}{3}$

(i) $\frac{\cancel{6}}{\cancel{18}} = \frac{1}{3}$

(v) $\frac{\cancel{4}}{\cancel{16}} = \frac{1}{4}$

(iii) $\frac{\cancel{12}}{\cancel{16}} = \frac{3}{4}$

Question 3:

Replace $\square$ in each of the following by the correct number:

(a) $\frac{2}{7} = \frac{8}{\square}$

(b) $\frac{5}{8} = \frac{10}{\square}$

(c) $\frac{3}{5} = \frac{\square}{20}$

(d) $\frac{45}{60} = \frac{15}{\square}$

(e) $\frac{18}{24} = \frac{\square}{4}$

Answer 3:

(a) $\frac{2}{7} = \frac{2\times4}{7\times4} = \frac{8}{\boxed{28}}$

(b) $\frac{5}{8} = \frac{5\times2}{8\times2} = \frac{10}{\boxed{16}}$

(c) $\frac{3}{5} = \frac{3\times4}{5\times4} = \frac{\boxed{12}}{20}$

(d) $\frac{45}{60} = \frac{45\div3}{60\div3} = \frac{15}{\boxed{20}}$

(e) $\frac{18}{24} = \frac{18\div6}{24\div6} = \frac{\boxed{3}}{4}$

Question 4:

Find the equivalent fraction of $\frac{3}{5}$ having:

(a) denominator 20

(b) numerator 9

(c) denominator 30

(d) numerator 27

Answer 4:

(a) $\frac{3}{5}=\frac{3\times4}{5\times4}=\frac{12}{20}$

(b) $\frac{3}{5}=\frac{3\times3}{5\times3}=\frac{9}{15}$

(c) $\frac{3}{5}=\frac{3\times6}{5\times6}=\frac{18}{30}$

(d) $\frac{3}{5}=\frac{3\times9}{5\times9}=\frac{27}{45}$

Question 5:

Find the equivalent fraction of $\frac{36}{48}$ with:

(a) numerator 9

(b) denominator 4

Answer 5:

(a) $\frac{36}{48}=\frac{36\div4}{48\div4}=\frac{9}{12}$

(b) $\frac{36}{48}=\frac{36\div12}{48\div12}=\frac{3}{4}$

Question 6:

Check whether the given fraction are equivalent:

(a) $\frac{5}{9},\frac{30}{54}$ (b) $\frac{3}{10},\frac{12}{50}$ (c) $\frac{7}{13},\frac{5}{11}$

Answer 6:

(a) $\frac{5}{9},\frac{30}{54}$ = $\frac{5\times6}{9\times6},\frac{30}{54}$ = $\frac{30}{54},\frac{30}{54}$

Therefore, $\frac{5}{9},\frac{30}{54}$ are equivalent.

(b) $\frac{3}{10},\frac{12}{50}$ = $\frac{3\times5}{10\times5},\frac{12}{50}$ = $\frac{15}{50},\frac{12}{50}$

Therefore, $\frac{3}{10},\frac{12}{50}$ are not equivalent.

(c) $\frac{7}{13},\frac{5}{11}$ = $\frac{7\times11}{13\times11},\frac{5\times13}{11\times13}$ = $\frac{77}{143},\frac{65}{143}$

Therefore, $\frac{7}{13},\frac{5}{11}$ are not equivalent fraction.

Question 7:

Reduce the following fractions to simplest form:

(a) $\frac{48}{60}$ (b) $\frac{150}{60}$ (c) $\frac{84}{98}$ (d) $\frac{12}{52}$ (e) $\frac{7}{28}$

Answer 7:

(a) $\frac{48}{60}=\frac{\cancel{2}\times\cancel{2}\times2\times2\times\cancel{3}}{\cancel{2}\times\cancel{2}\times\cancel{3}\times5}=\frac{4}{5}$

(b) $\frac{150}{60}=\frac{\cancel{3}\times5\times\cancel{10}}{2\times\cancel{3}\times\cancel{10}}=\frac{5}{2}$

(c) $\frac{84}{98}=\frac{2\times3\times\cancel{14}}{7\times\cancel{14}}=\frac{6}{7}$

(d) $\frac{12}{52}=\frac{\cancel{2}\times\cancel{2}\times3}{\cancel{2}\times\cancel{2}\times13}=\frac{3}{13}$

(e) $\frac{7}{28}=\frac{\cancel{7}}{2\times2\times\cancel{7}}=\frac{1}{4}$

Question 8:

Ramesh had 20 pencils, Sheelu had 50 pencils and Jamaal had 80 pencils. After 4 months, Ramesh used up 10 pencils, Sheelu used up 25 pencils and Jamaal used up 40 pencils. What fraction did each use up? Check is each has used up an equal fraction of her/his pencils?

Answer 8:

Ramesh: Total pencils = 20

Pencils used = 10

Fraction = $\frac{10}{20}=\frac{1}{2}$

Sheelu: Total pencils = 50

Pencils used = 25

Fraction = $\frac{25}{50}=\frac{1}{2}$

Jamaal: Total pencils = 80

Pencils used = 40

Fraction = $\frac{40}{80}=\frac{1}{2}$

Since, all of them used half of their pencils, therefore each one used up equal fraction of pencils.

Question 9:

Match the equivalent fractions and write two more for each:

(i)	$\frac{250}{400}$	(a)	$\frac{2}{3}$
(ii)	$\frac{180}{200}$	(b)	$\frac{2}{5}$
(iii)	$\frac{660}{990}$	(c)	$\frac{1}{2}$
(iv)	$\frac{180}{360}$	(d)	$\frac{5}{8}$
(v)	$\frac{220}{550}$	(e)	$\frac{9}{10}$

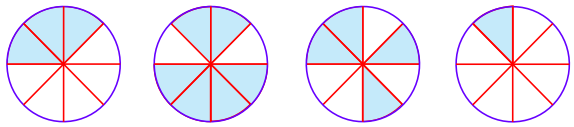
Answer 9:

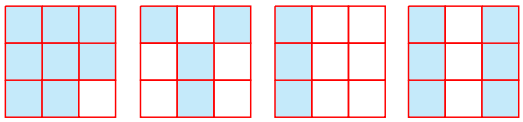
(i)	$\frac{\cancel{250}}{\cancel{400}} = \frac{5}{8}, \frac{10}{16}, \frac{15}{24}$	(d)	$\frac{5}{8}$
(ii)	$\frac{\cancel{180}}{\cancel{200}} = \frac{9}{10}, \frac{18}{20}, \frac{27}{30}$	(e)	$\frac{9}{10}$
(iii)	$\frac{\cancel{660}}{\cancel{990}} = \frac{2}{3}, \frac{4}{6}, \frac{6}{9}$	(a)	$\frac{2}{3}$
(iv)	$\frac{\cancel{180}}{\cancel{360}} = \frac{1}{2}, \frac{2}{4}, \frac{3}{6}$	(c)	$\frac{1}{2}$
(v)	$\frac{\cancel{220}}{\cancel{550}} = \frac{2}{5}, \frac{4}{10}, \frac{6}{15}$	(b)	$\frac{2}{5}$

Exercise 7.4

Question 1:

Write shaded portion as fraction. Arrange them in ascending and descending order using correct sign '<', '>', '=' between the fractions:

(a) 

(b) 

(c) Show $\frac{2}{6}, \frac{4}{6}, \frac{8}{6}$ and $\frac{6}{6}$ on the number line. Put appropriate signs between the fractions given:

$\frac{5}{6} \square \frac{2}{6}$, $\frac{3}{6} \square 0$, $\frac{1}{6} \square \frac{6}{6}$, $\frac{8}{6} \square \frac{5}{6}$

Answer 1:

(a) $\frac{3}{8}, \frac{6}{8}, \frac{4}{8}, \frac{1}{8}$

Ascending order: $\frac{1}{8} < \frac{3}{8} < \frac{4}{8} < \frac{6}{8}$

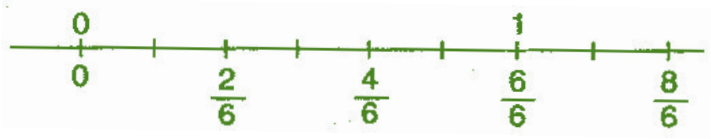
Descending order: $\frac{6}{8} > \frac{4}{8} > \frac{3}{8} > \frac{1}{8}$

(b) $\frac{8}{9}, \frac{4}{9}, \frac{3}{9}, \frac{6}{9}$

Ascending order: $\frac{3}{9} < \frac{4}{9} < \frac{6}{9} < \frac{8}{9}$

Descending order: $\frac{8}{9} > \frac{6}{9} > \frac{4}{9} > \frac{3}{9}$

(c) Number line



$\frac{5}{6} \boxed{>} \frac{2}{6}$ $\frac{1}{6} \boxed{<} \frac{6}{6}$ $\frac{3}{6} \boxed{>} \frac{0}{6}$ $\frac{8}{6} \boxed{>} \frac{5}{6}$

Question 2:

Compare the fractions and put an appropriate sign:

(a) $\frac{3}{6} \square \frac{5}{6}$

(b) $\frac{1}{7} \square \frac{1}{4}$

(c) $\frac{4}{5} \square \frac{5}{5}$

(d) $\frac{3}{5} \square \frac{3}{7}$

Answer 2:

(a) $\frac{3}{6} \boxed{<} \frac{5}{6}$

(b) $\frac{1}{7} \boxed{<} \frac{1}{4}$

(c) $\frac{4}{5} \boxed{<} \frac{5}{5}$

(d) $\frac{3}{5} \boxed{>} \frac{3}{7}$

Question 3:

Make five more each pairs and put appropriate signs.

Answer 3:

(a) $\frac{9}{10} \boxed{>} \frac{6}{10}$

(b) $\frac{1}{3} \boxed{>} \frac{1}{6}$

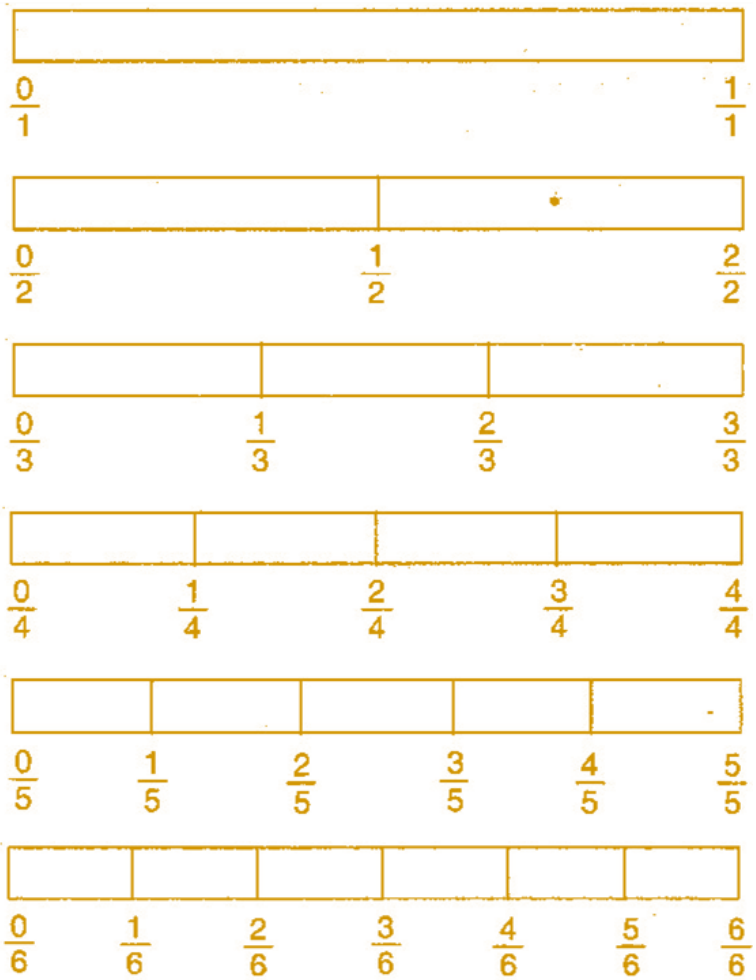
(c) $\frac{1}{8} \boxed{<} \frac{1}{5}$

(d) $\frac{7}{8} \boxed{<} \frac{11}{8}$

(e) $\frac{11}{13} \boxed{>} \frac{9}{13}$

Question 4:

Look at the figures and write '<' or '>' between the given pairs of fractions:



(a) $\frac{1}{6} \square \frac{1}{3}$ (b) $\frac{3}{4} \square \frac{2}{6}$ (c) $\frac{2}{3} \square \frac{2}{4}$

(d) $\frac{6}{6} \square \frac{3}{3}$ (e) $\frac{5}{6} \square \frac{5}{5}$

Make five more such problems and solve them with your friends.

Answer 4:

(a) $\frac{1}{6} < \frac{1}{3}$ (b) $\frac{3}{4} > \frac{2}{6}$ (c) $\frac{2}{3} > \frac{2}{4}$

(d) $\frac{6}{6} = \frac{3}{3}$ (e) $\frac{5}{6} < \frac{5}{5}$

Five more such problems:

(a) $\frac{1}{2} \square \frac{3}{6}$ (b) $\frac{2}{3} \square \frac{3}{5}$ (c) $\frac{3}{4} \square \frac{4}{6}$

(d) $\frac{5}{6} \square \frac{2}{2}$ (e) $\frac{0}{1} \square \frac{0}{6}$

Solution:

(a) $\frac{1}{2} \boxed{=} \frac{3}{6}$ (b) $\frac{2}{3} \boxed{>} \frac{3}{5}$ (c) $\frac{3}{4} \boxed{>} \frac{4}{6}$

(d) $\frac{5}{6} \boxed{<} \frac{2}{2}$ (e) $\frac{0}{1} \boxed{=} \frac{0}{6}$

Question 5:

How quickly can you do this? Fill appropriate sign (<, =, >):

(a) $\frac{1}{2} \square \frac{1}{5}$ (b) $\frac{2}{4} \square \frac{3}{6}$ (c) $\frac{3}{5} \square \frac{2}{3}$

(d) $\frac{3}{4} \square \frac{2}{8}$ (e) $\frac{3}{5} \square \frac{6}{5}$ (f) $\frac{7}{9} \square \frac{3}{9}$

(g) $\frac{1}{4} \square \frac{2}{8}$ (h) $\frac{6}{10} \square \frac{4}{5}$ (i) $\frac{3}{4} \square \frac{7}{8}$

(j) $\frac{6}{10} \square \frac{4}{5}$ (k) $\frac{5}{7} \square \frac{15}{21}$

Answer 5:

(a) $\frac{1}{2} \boxed{>} \frac{1}{5}$ (b) $\frac{2}{4} \boxed{=} \frac{3}{6}$ (c) $\frac{3}{5} \boxed{<} \frac{2}{3}$

(d) $\frac{3}{4} \boxed{>} \frac{2}{8}$ (e) $\frac{3}{5} \boxed{<} \frac{6}{5}$ (f) $\frac{7}{9} \boxed{>} \frac{3}{9}$

(g) $\frac{1}{4} \boxed{=} \frac{2}{8}$ (h) $\frac{6}{10} \boxed{<} \frac{4}{5}$ (i) $\frac{3}{4} \boxed{<} \frac{7}{8}$

(j) $\frac{6}{10} \boxed{<} \frac{4}{5}$ (k) $\frac{5}{7} \boxed{=} \frac{15}{21}$

Question 6:

The following fractions represent just three different numbers. Separate them into three groups of equivalent fractions, by changing each one to its simplest form:

(a) $\frac{2}{12}$ (b) $\frac{3}{15}$ (c) $\frac{8}{50}$ (d) $\frac{16}{100}$ (e) $\frac{10}{60}$ (f) $\frac{15}{75}$

(g) $\frac{12}{60}$ (h) $\frac{16}{96}$ (i) $\frac{12}{75}$ (j) $\frac{12}{72}$ (k) $\frac{3}{18}$ (l) $\frac{4}{25}$

Answer 6:

(a) $\frac{\cancel{2}}{\cancel{12}} = \frac{1}{6}$ (b) $\frac{\cancel{3}}{\cancel{15}} = \frac{1}{5}$ (c) $\frac{\cancel{8}}{\cancel{50}} = \frac{4}{25}$ (d) $\frac{\cancel{16}}{\cancel{100}} = \frac{4}{25}$

(e) $\frac{\cancel{10}}{\cancel{60}} = \frac{1}{6}$ (f) $\frac{\cancel{15}}{\cancel{75}} = \frac{1}{5}$ (g) $\frac{\cancel{12}}{\cancel{60}} = \frac{1}{5}$ (h) $\frac{\cancel{16}}{\cancel{96}} = \frac{1}{6}$

(i) $\frac{\cancel{12}}{\cancel{75}} = \frac{4}{25}$ (j) $\frac{\cancel{12}}{\cancel{72}} = \frac{1}{6}$ (k) $\frac{\cancel{3}}{\cancel{18}} = \frac{1}{6}$ (l) $\frac{4}{25} = \frac{4}{25}$

Equivalent groups:

I group: $\frac{1}{5}$ [(b), (f), (g)]

II group: $\frac{1}{6}$ [(a), (e), (h), (j), (k)]

III group: $\frac{4}{25}$ [(c), (d), (i), (l)]

Question 7:

Find answers to the following. Write and indicate how you solved them:

(a) Is $\frac{5}{9}$ equal to $\frac{4}{5}$? (b) Is $\frac{9}{16}$ equal to $\frac{5}{9}$?

(c) Is $\frac{4}{5}$ equal to $\frac{16}{20}$? (d) Is $\frac{1}{15}$ equal to $\frac{4}{30}$?

Answer 7:

(a) $\frac{5}{9}$ and $\frac{4}{5}$

$\Rightarrow \quad \frac{5\times5}{9\times5} = \frac{25}{45}$ and $\frac{4\times9}{5\times9} = \frac{36}{45}$ [$\because$ L.C.M. of 9 and 5 is 45]

Since, $\frac{25}{45} \neq \frac{36}{45}$

Therefore, $\frac{5}{9} \neq \frac{4}{5}$

(b) $\frac{9}{16}$ and $\frac{5}{9}$

$\Rightarrow \quad \frac{9\times9}{16\times9} = \frac{81}{144}$ and $\frac{5\times16}{9\times16} = \frac{80}{144}$ [$\because$ L.C.M. of 16 and 9 is 144]

Since, $\frac{81}{144} \neq \frac{80}{144}$

Therefore, $\frac{9}{16} \neq \frac{5}{9}$

(c) $\frac{4}{5}$ and $\frac{16}{20}$

$\Rightarrow \quad \frac{4\times20}{5\times20} = \frac{80}{100}$ and $\frac{16\times5}{20\times5} = \frac{80}{100}$ [$\because$ L.C.M. of 5 and 20 is 100]

Since, $\frac{80}{100} = \frac{80}{100}$

Therefore, $\frac{4}{5} = \frac{16}{20}$

(d) $\frac{1}{15}$ and $\frac{4}{30}$

$\Rightarrow \quad \frac{1\times2}{15\times2} = \frac{2}{30}$ and $\frac{4\times1}{30\times1} = \frac{4}{30}$ [$\because$ L.C.M. of 15 and 30 is 30]

Since, $\frac{4}{30} = \frac{4}{30}$

Therefore, $\frac{1}{15} = \frac{4}{30}$

Question 8:

Ila read 25 pages of a book containing 100 pages. Lalita read $\frac{2}{5}$ of the same book. Who read less?

Answer 8:

Ila read 25 pages out of 100 pages.

Fraction of reading the pages = $\frac{25}{100} = \frac{1}{4}th$ part of book

Lalita read $\frac{2}{5}th$ part of book = $\frac{40}{100}$ pages

Since $\frac{1}{4} < \frac{2}{5}$

Therefore, Ila read less.

Question 9:

Rafiq exercised for $\frac{3}{6}$ of an hour, while Rohit exercised for $\frac{3}{4}$ of an hour. Who exercised for a longer time?

Answer 9:

Rafiq exercised $\frac{3}{6}$ of an hour.

Rohit exercised $\frac{3}{4}$ of an hour.

Since $\frac{3}{4} > \frac{3}{6}$

Therefore, Rohit exercised for a longer time.

Question 10:

In a class A of 25 students, 20 passed in first class; in another class B of 30 students, 24 passed in first class. In which class was a greater fraction of students getting first class?

Answer 10:

In class A, 20 passed out of 25, i.e., $\frac{20}{25} = \frac{4}{5}$

In class B, 24 passed out of 30, i.e., $\frac{24}{30} = \frac{4}{5}$

Hence, each class have same fraction of student getting first class.

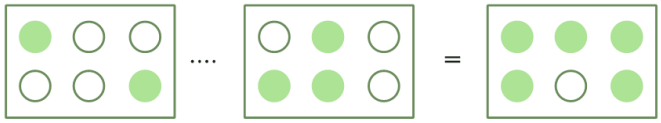
Exercise 7.5

Question 1:

Write the fractions appropriately as additions or subtractions:

(a) 

(b) 

(c) 

Answer 1:

(a) $\frac{1}{5}+\frac{2}{5}=\frac{1+2}{5}=\frac{3}{5}$

(b) $\frac{5}{5}-\frac{3}{5}=\frac{5-3}{5}=\frac{2}{5}$

(c) $\frac{2}{6}+\frac{3}{6}=\frac{2+3}{6}=\frac{5}{6}$

Question 2:

Solve:

(a) $\frac{1}{18}+\frac{1}{18}$ (b) $\frac{8}{15}+\frac{3}{15}$ (c) $\frac{7}{7}-\frac{5}{7}$

(d) $\frac{1}{22}+\frac{21}{22}$ (e) $\frac{12}{15}-\frac{7}{15}$ (f) $\frac{5}{8}+\frac{3}{8}$

(g) $1-\frac{2}{3}\left(1=\frac{3}{3}\right)$ (h) $\frac{1}{4}+\frac{0}{4}$ (i) $3-\frac{12}{5}$

Answer 2:

(a) $\frac{1}{18}+\frac{1}{18}=\frac{1+1}{18}=\frac{\cancel{2}}{\cancel{18}}=\frac{1}{9}$

(b) $\frac{8}{15}+\frac{3}{15}=\frac{8+3}{15}=\frac{11}{15}$

(c) $\frac{7}{7}-\frac{5}{7}=\frac{7-5}{7}=\frac{2}{7}$

(d) $\frac{1}{22}+\frac{21}{22}=\frac{1+21}{22}=\frac{\cancel{22}}{\cancel{22}}=1$

(e) $\frac{12}{15}-\frac{7}{15}=\frac{12-7}{15}=\frac{\cancel{5}}{\cancel{15}}=\frac{1}{3}$

(f) $\frac{5}{8}+\frac{3}{8}=\frac{\cancel{8}}{\cancel{8}}=1$

(g) $1-\frac{2}{3}=\frac{3}{3}-\frac{2}{3}=\frac{3-2}{2}=\frac{1}{3}$

(h) $\frac{1}{4}+\frac{0}{4}=\frac{1+0}{4}=\frac{1}{4}$

(i) $3-\frac{12}{5}=\frac{15}{5}-\frac{12}{5}=\frac{15-12}{5}=\frac{3}{5}$

Question 3:

Shubham painted $\frac{2}{3}$ of the wall space in his room. His sister Madhavi helped and painted $\frac{1}{3}$ of the wall space. How much did they paint together?

Answer 3:

Fraction of wall painted by Shubham = $\frac{2}{3}$

Fraction of wall painted by Madhavi = $\frac{1}{3}$

Total painting by both of them = $\frac{2}{3}+\frac{1}{3}=\frac{2+1}{3}=\frac{\cancel{3}}{\cancel{3}}=1$

Therefore, they painted complete wall.

Question 4:

Fill in the missing fractions:

(a) $\frac{7}{10}-\square=\frac{3}{10}$

(b) $\square-\frac{3}{21}=\frac{5}{21}$

(c) $\square-\frac{3}{6}=\frac{3}{6}$

(d) $\square+\frac{5}{27}=\frac{12}{27}$

Answer 4:

(a) $\frac{4}{10}$

(b) $\frac{8}{21}$

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

(d) $\frac{7}{27}$

Question 5:

Javed was given of a basket of oranges. What fraction of oranges was left in the basket?

Answer 5:

Total = 1

Fraction of Orange left = $1-\frac{5}{7}$

$$= \frac{7}{7}-\frac{5}{7}=\frac{7-5}{7}=\frac{2}{7}$$

Thus, $\frac{2}{7}$ oranges was left in the basket.

Exercise 7.6

Question 1:

Solve:

(a) $\frac{2}{3}+\frac{1}{7}$ (b) $\frac{3}{10}+\frac{7}{15}$ (c) $\frac{4}{9}+\frac{2}{7}$ (d) $\frac{5}{7}+\frac{1}{3}$

(e) $\frac{2}{5}+\frac{1}{6}$ (f) $\frac{4}{5}+\frac{2}{3}$ (g) $\frac{3}{4}-\frac{1}{3}$ (h) $\frac{5}{6}-\frac{1}{3}$

(i) $\frac{2}{3}+\frac{3}{4}+\frac{1}{2}$ (j) $\frac{1}{2}+\frac{1}{3}+\frac{1}{6}$ (k) $1\frac{1}{3}+3\frac{2}{3}$ (l) $4\frac{2}{3}+3\frac{1}{4}$

(m) $\frac{16}{5}-\frac{7}{5}$ (n) $\frac{4}{3}-\frac{1}{2}$

Answer 1:

(a) L.C.M. of 3 and 7 is 21

$\therefore \quad \frac{2}{3}+\frac{1}{7}=\frac{2\times7+1\times3}{21}=\frac{14+3}{21}=\frac{17}{21}$

(b) L.C.M. of 10 and 15 is 30

$\therefore \quad \frac{3}{10}+\frac{7}{15}=\frac{3\times3+7\times2}{30}=\frac{9+14}{30}=\frac{23}{30}$

(c) L.C.M. of 9 and 7 is 63

$\therefore \quad \frac{4}{9}+\frac{2}{7}=\frac{4\times7+2\times9}{63}=\frac{28+18}{63}=\frac{46}{63}$

(a) L.C.M. of 7 and 3 is 21

$\therefore \quad \frac{5}{7}+\frac{1}{3}=\frac{5\times3+7\times1}{21}=\frac{15+7}{21}=\frac{22}{21}=1\frac{1}{21}$

(b) L.C.M. of 5 and 6 is 30

$\therefore \quad \frac{2}{5}+\frac{1}{6}=\frac{2\times6+5\times1}{30}=\frac{12+5}{30}=\frac{17}{30}$

(c) L.C.M. of 5 and 3 is 15

$\therefore \quad \frac{4}{5}+\frac{2}{3}=\frac{4\times3+2\times5}{15}=\frac{12+10}{15}=\frac{22}{15}=1\frac{7}{15}$

(d) L.C.M. of 4 and 3 is 12

$\therefore \quad \frac{3}{4}-\frac{1}{3}=\frac{3\times3-4\times1}{12}=\frac{9-4}{12}=\frac{5}{12}$

(e) L.C.M. of 6 and 3 is 6

$\therefore \quad \frac{5}{6}-\frac{1}{3}=\frac{5\times1-2\times1}{6}=\frac{5-2}{6}=\frac{\cancel{3}}{\cancel{6}}=\frac{1}{2}$

(f) L.C.M. of 3, 4 and 2 is 12

$$\therefore \quad \frac{2}{3}+\frac{3}{4}+\frac{1}{2}=\frac{2\times4+3\times3+1\times6}{12}=\frac{6+9+6}{12}=\frac{23}{12}=1\frac{11}{12}$$

(g) L.C.M. of 2, 3, and 6 is 6

$$\therefore \quad \frac{1}{2}+\frac{1}{3}+\frac{1}{6}=\frac{1\times3+1\times2+1\times1}{6}=\frac{3+2+1}{6}=\frac{\cancel{6}}{\cancel{6}}=1$$

(h) L.C.M. of 3 and 3 is 3

$$\therefore \quad \frac{4}{3}+\frac{11}{3}=\frac{4+11}{3}=\frac{\cancel{15}}{\cancel{3}}=5$$

(i) L.C.M. of 3 and 4 is 12

$$\therefore \quad \frac{14}{3}+\frac{13}{4}=\frac{14\times4+13\times3}{12}=\frac{56+39}{12}=\frac{95}{12}=7\frac{11}{12}$$

(j) L.C.M. of 5 and 5 is 5

$$\therefore \quad \frac{16}{5}-\frac{7}{5}=\frac{16-7}{5}=\frac{9}{5}=1\frac{4}{5}$$

(k) L.C.M. of 3 and 2 is 6

$$\therefore \quad \frac{4}{3}-\frac{1}{2}=\frac{4\times2-1\times3}{6}=\frac{8-3}{6}=\frac{5}{6}$$

Question 2:

Sarika bought $\frac{2}{5}$ meter of ribbon and Lalita $\frac{3}{4}$ meter of ribbon. What is the total length of the ribbon they bought?

Answer 2:

Ribbon bought by Sarita = $\frac{2}{5}$ m and Ribbon bought by Lalita = $\frac{3}{4}$ m

Total length of ribbon = $\frac{2}{5}+\frac{3}{4}$

$$= \frac{2\times4+5\times3}{20} \quad [\because \text{ L.C.M. of 5 and 4 is 20}]$$

$$= \frac{8+15}{20}=\frac{23}{20}=1\frac{3}{20} \text{ m}$$

Therefore, they bought $1\frac{3}{20}$ m of ribbon.

Question 3:

Naina was given $1\frac{1}{2}$ piece of cake and Najma was given $1\frac{1}{3}$ piece of cake. Find the total amount of cake given to both of them.

Answer 3:

Cake taken by Naina = $1\frac{1}{2}$ piece and Cake taken by Najma = $1\frac{1}{3}$ piece

Total cake taken $= 1\frac{1}{2} + 1\frac{1}{3} = \frac{3}{2}+\frac{4}{3}$

$= \frac{3\times3+4\times2}{6}$ [$\because$ L.C.M. of 2 and 3 is 6]

$= \frac{9+8}{6} = \frac{17}{6} = 2\frac{5}{6}$

Therefore, the total consumption of cake is $2\frac{5}{6}$.

Question 4:

Fill in the boxes:

(a) $\square - \frac{5}{8} = \frac{1}{4}$

(b) $\square - \frac{1}{5} = \frac{1}{2}$

(c) $\frac{1}{2} - \square = \frac{1}{6}$

Answer 4:

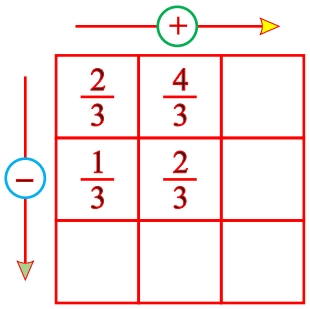
(a) $\frac{1}{4}+\frac{5}{8} = \frac{2+5}{8} = \frac{7}{8}$

(b) $\frac{1}{2}+\frac{1}{5} = \frac{5+2}{10} = \frac{7}{10}$

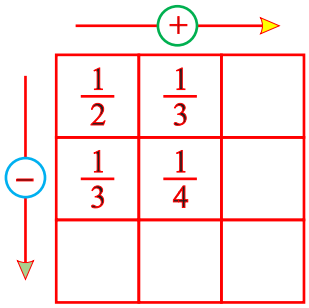
(c) $\frac{1}{2}-\frac{1}{6} = \frac{3-1}{6} = \frac{2}{6}$

Question 5:

Complete the addition – subtraction box:

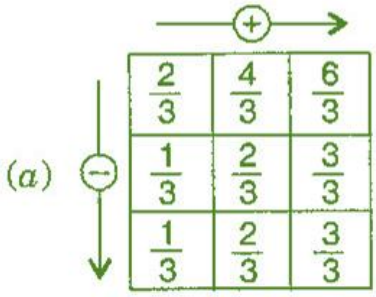


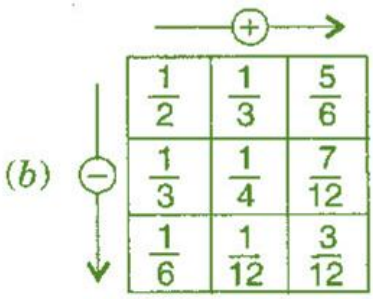
(a)



(b)

Answer 5:





Question 6:

A piece of wire $\frac{7}{8}$ meter long broke into two pieces. One piece was $\frac{1}{4}$ meter long. How long is the other piece?

Answer 6:

Total length of wire $= \frac{7}{8}$ meter

Length of first part $= \frac{1}{4}$ meter

Remaining part $= \frac{7}{8} - \frac{1}{4} = \frac{7\times1-2\times1}{8}$ [$\because$ L.C.M. of 8 and 4 is 8]

$= \frac{7-2}{8} = \frac{5}{8}$ meter

Therefore, the length of remaining part is $\frac{5}{8}$ meter.

Question 7:

Nandini house is $\frac{9}{10}$ km from her school. She walked some distance and then took a bus for $\frac{1}{2}$ km to reach the school. How far did she walk?

Answer 7:

Total distance between school and house = $\frac{9}{10}$ km

Distance covered by bus = $\frac{1}{2}$ km

Remaining distance $= \frac{9}{10} - \frac{1}{2} = \frac{9\times1-1\times5}{10}$ [$\because$ L.C.M. of 10 and 2 is 10]

$= \frac{9-5}{10} = \frac{4}{10} = \frac{2}{5}$ km

Therefore, the distance covered by walking us $\frac{2}{5}$ km.

Question 8:

Ahsa and Samuel have bookshelves of the same size partly filled with books. Asha's shelf is $\frac{5}{6}th$ full and Samuel's shelf is $\frac{2}{5}th$ full. Whose bookshelf is more full? By what fraction?

Answer 8:

$\frac{5}{6}$ and $\frac{2}{5}$

$\Rightarrow \quad \frac{5}{6}\times\frac{5}{5} = \frac{25}{30}$ and $\frac{2}{5}\times\frac{6}{6} = \frac{12}{30}$ [$\because$ L.C.M. of 6 and 5 is 30]

$\because \quad \frac{25}{30} > \frac{12}{30}$

$\Rightarrow \quad \frac{5}{6} > \frac{2}{5}$

$\therefore$ Asha's bookshelf is more covered than Samueal.

Difference = $\frac{25}{30} - \frac{12}{30} = \frac{13}{30}$

Question 9:

Jaidev takes $2\frac{1}{5}$ minutes to walk across the school ground. Rahul takes $\frac{7}{4}$ minutes to do same. Who takes less time and by what fraction?

Answer 9:

Time taken by jaidev = $2\frac{1}{5}$ minutes = $\frac{11}{5}$ minutes

Time taken by Rahul = $\frac{7}{4}$ minutes

Difference $= \frac{11}{5} - \frac{7}{4} = \frac{11\times 4 - 7\times 5}{20}$ [$\because$ L.C.M. of 5 and 4 is 20]

$= \frac{44-35}{20} = \frac{9}{20}$ minutes

Thus, Rahul takes less time, which is $\frac{9}{20}$ minutes.

Mathematics

(Chapter – 8) (Decimals)

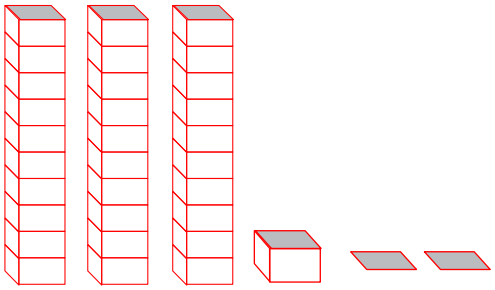
(Class – VI)

Exercise 8.1

Question 1:

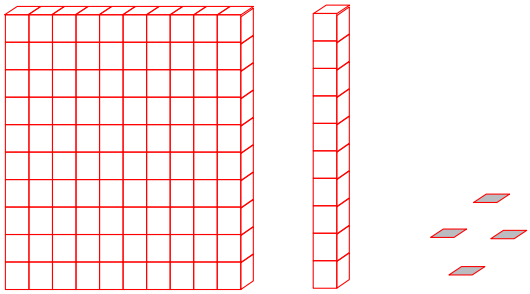
Write the following as numbers in the given table:

a



Tens Ones Tenths

b



Hundreds Tens Tenths

Hundreds (100)	Tens (10)	Ones (1)	Tenths $\left(\frac{1}{10}\right)$

Answer 1:

Hundreds (100)	Tens (10)	Ones (1)	Tenths $\left(\frac{1}{10}\right)$
0	3	2	31.2
1	1	4	110.4

Question 2:

Write the following decimals in the place value table:

(a) 19.4 **(b)** 0.3 **(c)** 10.6 **(d)** 205.9

Answer 2:

(a)

Hundreds	Tens	Ones	Tenths
0	1	9	4

(b)

Hundreds	Tens	Ones	Tenths
0	0	0	3

(c)

Hundreds	Tens	Ones	Tenths
0	1	0	6

(d)

Hundreds	Tens	Ones	Tenths
0	0	5	9

Question 3:

Write each of the following as decimals:

(a) seven-tenths

(b) Two tens and nine-tenths

(c) Fourteen point six

(d) One hundred and two-ones

(e) Six hundred point eight

Answer 3:

(a) seven-tenths = 7 tenths = $\frac{7}{10}$ = 0.7

(b) 2 tens and 9-tenths = 2 x 10 + $\frac{9}{10}$ = 20 + 0.9 =20.9

(c) Fourteen point six = 14.6

(d) One hundred and 2-ones = 100 + 2 x 1 = 100 + 2 = 102

(e) Six hundred point eight = 600.8

Question 4:

Write each of the following as decimals:

(a) $\frac{5}{10}$ (b) $3+\frac{7}{10}$ (c) $200+60+5+\frac{1}{10}$

(d) $70+\frac{8}{10}$ (e) $\frac{88}{10}$ (f) $4\frac{2}{10}$

(g) $\frac{3}{2}$ (h) $\frac{2}{5}$ (i) $\frac{12}{5}$

(j) $3\frac{3}{5}$ (k) $4\frac{1}{2}$

Answer 4:

(a) $\frac{5}{10} = 0.5$

(b) $3+\frac{7}{10} = 3 + 0.7 = 3.7$

(c) $200+60+5+\frac{1}{10} = 200 + 60 + 5 + 0.1 = 265.1$

(d) $70+\frac{8}{10} = 70 + 0.8 = 70.8$

(e) $\frac{88}{10}=\frac{80+8}{10}=\frac{8\cancel{0}}{1\cancel{0}}+\frac{8}{10}=8+\frac{8}{10} = 8 + 0.8 = 8.8$

(f) $4\frac{2}{10}=4+\frac{2}{10} = 4 + 0.2 = 4.2$

(g) $\frac{3}{2}=\frac{3\times5}{2\times5}=\frac{15}{10}=\frac{10+5}{10}=\frac{1\cancel{0}}{1\cancel{0}}+\frac{5}{10} = 1 + 0.5 = 1.5$

(h) $\frac{2}{5}=\frac{2\times2}{5\times2}=\frac{4}{10} = 0.4$

(i) $\frac{12}{5}=\frac{12\times2}{5\times2}=\frac{24}{10}=\frac{20+4}{10}=\frac{2\cancel{0}}{1\cancel{0}}+\frac{4}{10} = 2 + 0.4 = 2.4$

(j) $3\frac{3}{5}=3+\frac{3}{5}=3+\frac{3\times2}{5\times2}=3+\frac{6}{10} = 3 + 0.6 = 3.6$

(k) $4\frac{1}{2}=4+\frac{1}{2}=4+\frac{1\times5}{2\times5}=4+\frac{5}{10} = 4 + 0.5 = 4.5$

Question 5:

Write the following decimals as fraction. Reduce the fractions to lowest terms:

(a) 0.6 (b) 2.5 (c) 1.0 (d) 3.8

(e) 13.7 (f) 21.2 (g) 6.4

Answer 5:

(a) $0.6 = \frac{\cancel{6}}{\cancel{10}} = \frac{3}{5}$

(b) $2.5 = \frac{\cancel{25}}{\cancel{10}} = \frac{5}{2}$

(c) $1.0 = \frac{\cancel{10}}{\cancel{10}} = 1$

(d) $3.8 = \frac{\cancel{38}}{10} = \frac{19}{5}$

(e) $13.7 = \frac{137}{10}$

(f) $21.2 = \frac{\cancel{212}}{\cancel{10}} = \frac{106}{5}$

(g) $6.4 = \frac{\cancel{64}}{\cancel{10}} = \frac{32}{5}$

Question 6:

Express the following as cm using decimals:

(a) 2 mm (b) 30 mm (c) 116 mm (d) 4 cm 2 mm

(e) 162 mm (f) 83 mm

Answer 6:

(a) ∵ 10 mm = 1 cm

∴ 1 mm = $\frac{1}{10}$ cm

∴ 2 mm = $\frac{1}{10}$ x 2 = 0.2 cm

(b) ∵ 10 mm = 1 cm

∴ 1 mm = $\frac{1}{10}$ cm

∴ 30 mm = $\frac{1}{10}$ x 30 = 3.0 cm

(c) ∵ 10 mm = 1 cm

∴ 1 mm = $\frac{1}{10}$ cm

∴ 116 mm = $\frac{1}{10}$ x 116 = 11.6 cm

(d) 4 cm + $\frac{2}{10}$ cm [∵ 10 mm = 1cm]

4 + 0.2 = 4.2 cm

(e) ∵ 10 mm = 1 cm

∴ 1 mm = $\frac{1}{10}$ cm

∴ 162 mm = $\frac{1}{10}$ x 162 = 16.2 cm

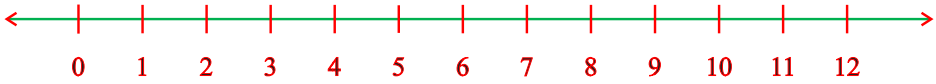
(f) ∵ 10 mm = 1 cm

∴ 1 mm = $\frac{1}{10}$ cm

∴ 83 mm = $\frac{1}{10}$ x 83 = 8.3 cm

Question 7:

Between which two whole numbers on the number line are the given lie? Which of these whole numbers is nearer the number?



(a) 0.8 (b) 5.1 (c) 2.6

(d) 6.4 (e) 9.1 (f) 4.9

Answer 7:

(a) From 0 to 1, 0.8 is nearest to 1.

(b) From 5 to 6, 5.1 is nearest to 5.

(c) From 2 to 3, 2.6 is nearest to 3.

(d) From 6 to 7, 6.4 is nearest to 6.

(e) From 9 to 10, 9.1 is nearest to 9.

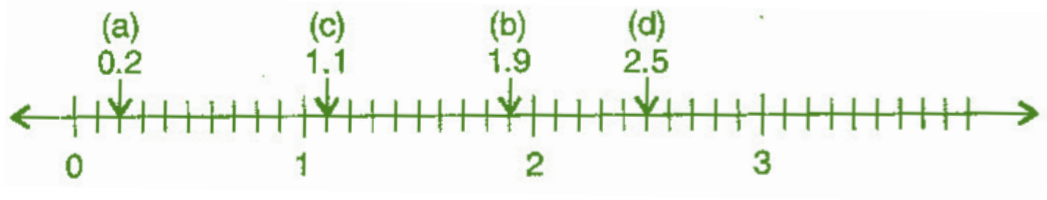
(f) From 4 to 5, 4.9 is nearest to 5.

Question 8:

Show the following numbers on the number line:

(a) 0.2 (b) 1.9 (c) 1.1 (d) 2.5

Answer 8:



Question 9:

Write the decimal number represented by the points A, B, C, D on the given number line.

Answer 9:

$A = 0 + \frac{8}{10} = 0.8$

$B = 1 + \frac{3}{10} = 1.3$

$C = 2 + \frac{2}{10} = 2.2$

$D = 2 + \frac{9}{10} = 2.9$

Question 10:

(a) The length of Ramesh's notebook is 9 cm and 5 mm. What will be its length in cm?

(b) The length of a young gram plant is 65 mm. Express its length in cm.

Answer 10:

(a) 9 cm 5 mm = 9 cm + 5 mm = $9 + \frac{5}{10}$ = 9.5 cm

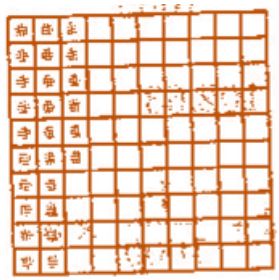
(b) 65 mm = $\frac{65}{10}$ cm = 6.5 cm

Exercise 8.2

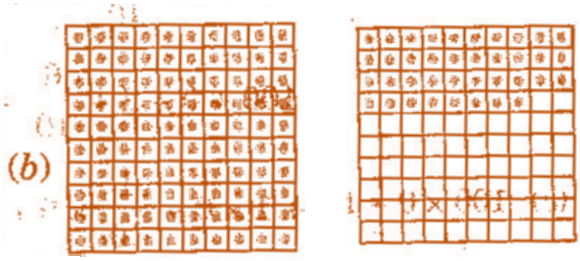
Question 1:

Complete the table with the help of these boxes and use decimals to write the number:

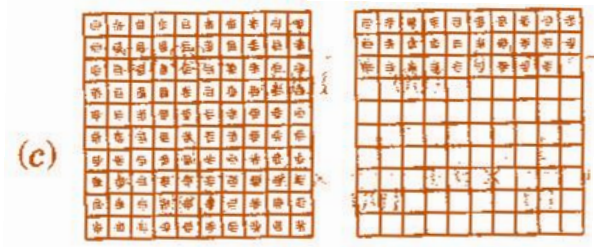
(a)



(b)



(c)



	Ones	Tenths	Hundredths	Numbers
(a)				
(b)				
(c)				

Answer 1:

	Ones	Tenths	Hundredths	Numbers
(a)	0	2	6	0.26
(b)	1	3	8	1.38
(c)	1	2	8	1.28

Question 2:

Write the numbers given in the following place value table in decimal form:

	Hundreds **100**	**Tens** **10**	**Ones** **1**	**Tenths** $\frac{1}{10}$	**Hundredths** $\frac{1}{100}$	**Thousandths** $\frac{1}{1000}$
(a)	0	0	3	2	5	0
(b)	1	0	2	6	3	0
(c)	0	3	0	0	2	5
(d)	2	1	1	9	0	2
(e)	0	1	2	2	4	1

Answer 2:

(a) $0 \times 100 + 0 \times 10 + 3 \times 1 + 2 \times \frac{1}{10} + 5 \times \frac{1}{100} + 0 \times \frac{1}{1000}$

$= 0 + 0 + 3 + 0.2 + 0.05 + 0 = 3.25$

(b) $1 \times 100 + 0 \times 10 + 2 \times 1 + 6 \times \frac{1}{10} + 3 \times \frac{1}{100} + 0 \times \frac{1}{1000}$

$= 1 + 0 + 2 + 0.6 + 0.03 + 0 = 102.63$

(c) $0 \times 100 + 3 \times 10 + 0 \times 1 + 0 \times \frac{1}{10} + 2 \times \frac{1}{100} + 5 \times \frac{1}{1000}$

$= 0 + 30 + 0 + 0 + 0.02 + 0.005 = 30.025$

(d) $2 \times 100 + 1 \times 10 + 1 \times 1 + 9 \times \frac{1}{10} + 0 \times \frac{1}{100} + 2 \times \frac{1}{1000}$

$= 200 + 10 + 1 + 0.9 + 0 + 0.002 = 211.902$

(e) $0 \times 100 + 1 \times 10 + 2 \times 1 + 2 \times \frac{1}{10} + 4 \times \frac{1}{100} + 1 \times \frac{1}{1000}$

$=0 + 10 + 2 + 0.2 + 0.04 + 0.001 = 12.241$

Question 3:

Write the following decimals in the place value table:

(a) 0.29 (b) 2.08 (c) 19.60 (d) 148.32 (e) 200.812

Answer 3:

	Numbers	Hundreds	Tens	Ones	Tenths	Hundredths	Thousandths
		100	10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
(a)	0.29	0	0	0	2	9	0
(b)	2.08	0	0	2	0	8	0
(c)	19.60	0	1	9	6	0	0
(d)	148.32	1	4	8	3	2	0
(e)	200.812	2	0	0	8	1	2

Question 4:

Write each of the following as decimals:

(a) $20+9+\frac{4}{10}+\frac{1}{100}$ (b) $137+\frac{5}{100}$ (c) $\frac{7}{10}+\frac{6}{100}+\frac{4}{1000}$

(d) $23+\frac{2}{10}+\frac{6}{1000}$ (e) $700+20+5+\frac{9}{100}$

Answer 4:

(a) 20 + 9 + 0.4 + 0.01 = 29.41

(b) 137 + 0.05 = 137.05

(c) 0.7 + 0.06 + 0.004 = 0.764

(d) 23 + 0.2 + 0.006 = 23.206

(e) 700 + 20 + 5 + 0.09 = 725.09

Question 5:

Write each of the following decimals in words:

(a) 0.03 (b) 1.20

(c) 108.56 (d) 10.07

(e) 0.032 (f) 5.008

Answer 5:

(a) Zero point zero three
(b) One point two zero
(c) One hundred and eight point five six
(d) Ten point zero seven
(e) Zero point zero three two
(f) Five point zero zero eight

Question 6:

Between which two numbers in tenths place on the number line does each of the given number lie?

(a) 0.06
(b) 0.45
(c) 0.19
(d) 0.66
(e) 0.92
(f) 0.57

Answer 6:

All the numbers lie between 0 and 1.

(a) 0.06 is nearer to 0.1.
(b) 0.45 is nearer to 0.5.
(c) 0.19 is nearer to 0.2.
(d) 0.66 is nearer to 0.7.
(e) 0.92 is nearer to 0.9.
(f) 0.57 is nearer to 0.6.

Question 7:

Write as fractions in lowest terms:

(a) 0.60
(b) 0.05
(c) 0.75
(d) 0.18
(e) 0.25
(f) 0.125
(g) 0.066

Answer 7:

(a) $0.60 = \frac{\cancel{60}}{\cancel{100}} = \frac{3}{5}$

(b) $0.05 = \frac{\cancel{5}}{\cancel{100}} = \frac{1}{20}$

(c) $0.75 = \frac{\cancel{75}}{\cancel{100}} = \frac{3}{4}$

(d) $0.18 = \frac{\cancel{18}}{\cancel{100}} = \frac{9}{50}$

(e) $0.25 = \frac{\cancel{25}}{\cancel{100}} = \frac{1}{4}$

(f) $0.125 = \frac{\cancel{125}}{\cancel{1000}} = \frac{1}{8}$

(f) $0.066 = \frac{\cancel{66}}{\cancel{1000}} = \frac{33}{500}$

Exercise 8.3

Question 1:

Which is greater:

(a) 0.3 or 0.4

(b) 0.07 or 0.02

(c) 3 or 0.8

(d) 0.5 or 0.05

(e) 1.23 or 1.2

(f) 0.099 or 0.19

(g) 1.5 or 1.50

(h) 1.431 or 1.490

(i) 3.3 or 3.300

(j) 5.64 or 5.603

Answer 1:

Before comparing, we write both terms in like decimals:

(a) $0.3 < 0.4$

(b) $0.07 > 0.02$

(c) 3.0 or 0.8 $\Rightarrow 3.0 > 0.8$

(d) 0.50 or 0.05 $\Rightarrow 0.50 > 0.05$

(e) 1.23 or 1.20 $\Rightarrow 1.23 > 1.20$

(f) 0.099 or 0.190 $\Rightarrow 0.099 < 0.190$

(g) 1.50 or 1.50 $\Rightarrow 1.50 = 1.50$

(h) $1.431 < 1.490$

(i) 3.300 or 3.300 $\Rightarrow 3.300 = 3.300$

(j) 5.640 or 5.603 $\Rightarrow 5.640 > 5.603$

Question 2:

Make five more examples and find the greater:

(a) 1.8 or 1.82

(b) 1.0009 or 1.09

(c) 10.01 or 100.1

(d) 5.100 or 5.0100

(e) 04.213 or 0421.3

Answer 2:

Before comparing, we write both terms in like decimals

(a) 1.80 or 1.82 $\Rightarrow$ 1.82 is greater than 1.8

(b) 1.0009 or 1.0900 $\Rightarrow$ 1.09 is greater than 1.0009

(c) 10.01 or 100.10 $\Rightarrow$ 100.1 is greater than 10.01

(d) 5.1000 or 5.0100 $\Rightarrow$ 5.100 is greater than 5.0100

(e) 04.213 or 0421.300 $\Rightarrow$ 0421.3 is greater than 04.213

Exercise 8.4

Question 1:

Express as rupees using decimals:

(a) 5 paise
(b) 75 paise
(c) 20 paise
(d) 50 rupees 90 paise
(e) 725 paise

Answer 1:

(a) $\because$ 1 paisa = ₹ $\frac{1}{100}$

$\therefore$ 5 paise = $\frac{1}{100}$ x 5 = ₹ 0.05

(b) $\because$ 1 paisa = ₹ $\frac{1}{100}$

$\therefore$ 75 paise = $\frac{1}{100}$ x 5 = ₹ 0.75

(c) $\because$ 1 paisa = ₹ $\frac{1}{100}$

$\therefore$ 20 paise = $\frac{1}{100}$ x 5 = ₹ 0.05

(d) $\because$ 1 paisa = ₹ $\frac{1}{100}$

$\therefore$ ₹ 50+90paise=50+ $\frac{1}{100}$ x90 =₹50.90

(e) $\because$ 1 paisa = ₹ $\frac{1}{100}$

$\therefore$ 725 paise = $\frac{1}{100}$ x 725 = $\frac{725}{100}$ = ₹ 7.25

Question 2:

Express as meters using decimals:

(a) 15 cm
(b) 6 cm
(c) 2 m 45 cm
(d) 9 m 7 cm
(e) 419 cm

Answer 2:

(a) $\because$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 15 cm = $\frac{1}{100}$ x 15 = 0.15 m

(b) $\because$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 6 cm = $\frac{1}{100}$ x 6 = 0.06 m

(c) $\because$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 2 m 45 cm = 2 + $\frac{1}{100}$ x 45 = 2.45 m

(d) $\because$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 9 m 7 cm = 9 + $\frac{1}{100}$ x 7 = 9.07 m

(e) $\because$ 1 cm = $\frac{1}{100}$ m

$\therefore$ 419 cm = $\frac{1}{100}$ x 419 = $\frac{419}{100}$ = 4.19 m

Question 3:

Express as cm using decimals:

(a) 5 mm

(b) 60 mm

(c) 164 mm

(d) 9 cm 8 mm

(e) 93 mm

Answer 3:

(a) $\because$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 5 mm = $\frac{1}{10}$ x 5 = 0.5 cm

(b) $\because$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 60 mm = $\frac{1}{10}$ x 60 = 6 cm

(c) $\because$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 164 mm = $\frac{1}{10}$ x 164 = 16.4 cm

(d) $\because$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 9cm 8mm = 9+$\frac{1}{10}$ x 8 =9+0.8=9.8 cm

(e) $\because$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 93 mm = $\frac{1}{10}$ x 93 = 9.3 cm

Question 4:

Express as km using decimals:

(a) 8 m

(b) 88 m

(c) 8888 m

(d) 70 km 5 m

Answer 4:

(a) $\because$ 1 m = $\frac{1}{1000}$ km

$\therefore$ 8 m = $\frac{1}{1000}$ x 8 = 0.008 km

(b) $\because$ 1 m = $\frac{1}{1000}$ km

$\therefore$ 88 m = $\frac{1}{1000}$ x 88 = 0.088 km

(c) $\because$ 1 m = $\frac{1}{1000}$ km

$\therefore$ 8888 m = $\frac{1}{1000}$ x 8888 = 8.888 km

(d) $\because$ 1 m = $\frac{1}{1000}$ km

$\therefore$ 70 km 5m =70+ $\frac{1}{1000}$ x 5 =70.005 km

Question 5:

Express as kg using decimals:

(a) 2 g

(b) 100 g

(c) 3750 g

(d) 5 kg 8 g

(e) 26 kg 50 g

Answer 5:

(a) $\because$ 1 g = $\frac{1}{1000}$ kg

$\therefore$ 2 g = $\frac{1}{1000}$ x 2 = 0.002 kg

(b) $\because$ 1 g = $\frac{1}{1000}$ kg

$\therefore$ 100 g = $\frac{1}{1000}$ x 100 = 0.1 kg

(c) $\because$ 1 g = $\frac{1}{1000}$ kg

$\therefore$ 3750 g = $\frac{1}{1000}$ x 3750 = 3.750 kg

(d) $\because$ 1 g = $\frac{1}{1000}$ kg

$\therefore$ 5 kg 8 g = 5 + $\frac{1}{1000}$ x 8 = 5.008 kg

(e) $\because$ 1 g = $\frac{1}{1000}$ kg

$\therefore$ 26 kg 50 g = 26 + $\frac{1}{1000}$ x 50 = 26.050 kg

Exercise 8.5

Question 1:

Find the sum in each of the following:

(a) 0.007 + 8.5 + 30.08

(b) 15 + 0.632 + 13.8

(c) 27.076 + 0.55 + 0.004

(d) 25.65 + 9.005 + 3.7

(e) 0.75 + 10.425 + 2

(f) 280.69 + 25.2 + 38

Answer 1:

(a)

	H	T	O	.	Tenth	Hund.	Thou.	
			0	.	0	0	7	
			8	.	5			
+		3	0	.	0	8		
		3	8	.	5	8	7	= 38.587

(b)

	H	T	O	.	Tenth	Hund.	Thou.	
	0	1	5	.	0	0	0	
				.	6	3	2	
+		1	3	.	8			
		2	9	.	4	3	2	= 29.432

(c)

	H	T	O	.	Tenth	Hund.	Thou.	
		2	7	.	0	7	6	
				.	5	5		
+				.	0	0	4	
		2	7	.	6	3	0	= 27.630

(d)

	H	T	O	.	Tenth	Hund.	Thou.	
		2	5	.	6	5		
			9	.	0	0	5	
+			3	.	7			
		3	8	.	3	5	5	= 38.355

(e)

	H	T	O	.	Tenth	Hund.	Thou.	
				.	7	5		
		1	0	.	4	2	5	
+			2	.				
		1	3	.	1	7	5	= 13.175

(f)		H	T	O	.	Tenth	Hund.	Thou.	
		2	8	0	.	6	9		
			2	5	.	2			
	+		3	8	.				
		3	4	3	.	8	9		= 343.89

Question 2:

Rashid spent ₹35.75 for Maths book and ₹32.60 for Science book. Find the total amount spent by Rashid.

Answer 2:

Money spent for Maths book = ₹35.75
Money spent for Science book = ₹32.60
Total money spent = ₹35.75 + ₹32.60 = ₹68.35
Therefore, total money spent by Rashid is ₹68.35.

Question 3:

Radhika's mother have her ₹10.50 and her father gave her ₹15.80. Find the total amount given to Radhika by the parents.

Answer 3:

Money given by mother = ₹10.50
Money given by father = ₹15.80
Total money received by Radha = ₹10.50 + ₹15.80 = ₹26.30
Therefore, the total money received by Radha is ₹26.30.

Question 4:

Nasreen bought 3 m 20 cm cloth for her shirt and 2 m 5 cm cloth for her trouser. Find the total length of cloth bought by her.

Answer 4:

Cloth bought for shirt = 3 m 20 cm = 3.20 m
Cloth bought for trouser = 2 m 5 cm = 2.05 m
Total length of cloth bought by Nasreen = 3.20 + 2.05 = 5.25 m
Therefore, the total length of cloth bought by Nasreen is 5.25 m

Question 5:

Naresh walked 2 km 35 m in the morning and 1 km 7 m in the evening. How much distance did he walk in all?

Answer 5:

Distance travelled in morning = 2 km 35 m = 2.035 km
Distance travelled in evening = 1 km 7 m = 1.007 km
Total distance travelled = 2.035 + 1.007 = 3.042 km
Therefore, the total distance travelled by Naresh is 3.042 km.

Question 6:

Sunita travelled 15 km 268 m by bus, 7 km 7 m by car and 500 m by foot in order to reach her school. How far is her school from her residence?

Answer 6:

Distance travelled by bus = 15 km 268 m = 15.268 km
Distance travelled by car = 7 km 7 m = 7.007 km
Distance travelled on foot = 500 m = 0.500 km
Total distance travelled = 15.268 + 7.007 + 0.500 = 22.775 km
Therefore, total distance travelled by Sunita is 22.775 km.

Question 7:

Ravi purchases 5 kg 400 g rice, 2 kg 20 g sugar and 10 kg 850 g flour. Find the total weight of his purchases.

Answer 7:

Weight of Rice = 5 kg 400 g = 5.400 kg
Weight of Sugar = 2 kg 20 g = 2.020 kg
Weight of Flour = 10 kg 850 g = 10.850 kg
Total weight = 5.400 + 2.020 + 10.850 = 18.270 kg
Therefore, the total weight of Ravi's purchase = 18.270 kg.

Exercise 8.6

Question 1:

Subtract:

(a) ₹18.25 from ₹20.75

(b) 202.54 m from 250

(c) ₹5.36 from ₹8.40

(d) 2.051 km from 5.206 km

(e) 0.314 kg from 2.107 kg

Answer 1:

(a)
$$\begin{array}{r} 20.75 \\ -\,18.25 \\ \hline 02.50 \end{array}$$

= ₹2.50

(b)
$$\begin{array}{r} 250.00 \\ -\,202.54 \\ \hline 47.46 \end{array}$$

= 47.46 m

(c)
$$\begin{array}{r} 8.40 \\ -\,5.36 \\ \hline 3.04 \end{array}$$

= ₹3.04

(d)
$$\begin{array}{r} 5.206 \\ -\,2.051 \\ \hline 3.155 \end{array}$$

= 3.155 km

(e)
$$\begin{array}{r} 2.107 \\ -\,0.314 \\ \hline 1.793 \end{array}$$

= 1.793 kg

Question 2:

Find the value of:

(a) 9.756 – 6.28

(b) 21.05 – 15.27

(c) 18.5 – 6.79

(d) 11.6 – 9.847

Answer 2:

(a)
$$\begin{array}{r} 9.756 \\ -\,6.28 \\ \hline 3.476 \end{array}$$

= 3.476

(b)
$$\begin{array}{r} 21.05 \\ -\,15.27 \\ \hline 05.78 \end{array}$$

= 5.78

(c)
$$\begin{array}{r} 18.50 \\ -\ 6.79 \\ \hline 11.71 \end{array}$$

= 11.71

(d)
$$\begin{array}{r} 11.600 \\ -9.847 \\ \hline 1.753 \end{array}$$

= 1.753

Question 3:

Raju bought a book of ₹35.65. He gave ₹50 to the shopkeeper. How much money did he get back from the shopkeeper?

Answer 3:

Total amount given to shopkeeper = ₹50
Cost of book = ₹35.65
Amount left = ₹50.00 – ₹35.65
= ₹14.35
Therefore, Raju got back ₹14.35 from the shopkeeper.

Question 4:

Rani had ₹18.50. She bought one ice-cream for ₹11.75. How much money does she have now?

Answer 4:

Total money = ₹18.50
Cost of Ice-cream = ₹11.75
Amount left = ₹18.50 – ₹11.75
= ₹6.75
Therefore, Rani has ₹6.75 now.

Question 5:

Tina had 20 m 5 cm long cloth. She cuts 4 m 50 cm length of cloth from this for making a curtain. How much cloth is left with her?

Answer 5:

Total length of cloth = 20 m 5 cm = 20.05 m
Length of cloth used = 4 m 50 cm = 4.50 m
Remaining cloth = 20.05 m – 4.50 m = 15.55 m
Therefore, 15.55 m of cloth is left with Tina.

Question 6:

Namita travels 20 km 50 m every day. Out of this she travels 10 km 200 m by bus and the rest by auto. How much distance does she travel by auto?

Answer 6:

Total distance travel = 20 km 50 m = 20.050 km
Distance travelled by bus = 10 km 200 m = 10.200 km
Distance travelled by auto = 20.050 – 10.200 = 9.850 km
Therefore, 9.850 km distance travels by auto.

Question 7:

Aakash bought vegetables weighing 10 kg. Out of this 3 kg 500 g in onions, 2 kg 75 g is tomatoes and the rest is potatoes. What is the weight of the potatoes?

Answer 7:

Weight of onions = 3 kg 500 g = 3.500 kg
Weight of tomatoes = 2 kg 75 g = 2.075 kg
Total weight of onions and tomatoes = 3.500 + 2.075 = 5.575 kg
Therefore, weight of potatoes = 10.000 – 5.575 = 4.425 kg
Thus, the weight of potatoes is 4.425 kg.

Mathematics

(Chapter – 9) (Data Handling)

(Class – VI)

Exercise 9.1

Question 1:

In a mathematics test the following marks were obtained by 40 students. Arrange these marks in a table using tally marks.

8	1	3	7	6	5	5	4	4	2
4	9	5	3	7	1	6	5	2	7
7	3	8	4	2	8	9	5	8	6
7	4	5	6	9	6	4	4	6	6

(a) Find how many students obtained marks equal to or more than 7?

(b) How many students obtained marks below 4?

Answer 1:

Marks	Tally Marks	No. of students
1		2
2		3
3		3
4		7
5		6
6		7
7		5
8		4
9		3

(a) Twelve students

(b) Eight students

Question 2:

Following is the choice of sweets of 30 students of Class VI.

Ladoo, Barfi, Ladoo, jalebi, Ladoo, Rashulla, Jalebi, Ladoo, Barfi, Rasgulla, Ladoo, Jalebi, Jalebi, Rashulla, Ladoo, Rasgulla, Jalebi, Ladoo, Rasgulla, Ladoo, Ladoo, Barfi, Rasgulla, Rasgulla, Jalebi, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo

(a) Arrange the names of sweets in a table using tally marks.

(b) Which sweet is preferred by most of the students?

Answer 2:

(a) Table using tally marks:

Sweets	Tally Marks	No. of students
Ladoo		11
Barfi		3
Jalebi		7
Rasgulla		9
		30

(b) Ladoo. Because 11 students prefer eat.

Question 3:

Catherine threw a dice 40 times and noted the number appearing each time as shown below:

1	3	5	6	6	3	5	4	1	6
2	5	3	4	6	1	5	5	6	1
1	2	2	3	5	2	4	5	5	6
5	1	6	2	3	5	2	4	1	5

Make a table and enter the data using tally marks. Find the number that appeared.

(a) The minimum number of times.

(b) The maximum number of times.

(c) Find those numbers that appear an equal number of times.

Answer 3:

Numbers	Tally Marks	How many times?
1		7
2		6
3		5
4		4
5		11
6		7

(a) The minimum number of times = 4

(b) The maximum number of times = 5

(c) 1 and 6

Question 4:

Following pictograph shows the number of tractors in five villages:

Villages	Number of tractors - 1 Tractor
Village A	
Village B	
Village C	
Village D	
Village E	

Observe the pictograph and answer the following questions:

(i) Which village has the minimum number of tractors?

(ii) Which village has the maximum number of tractors?

(iii) How many more tractors village C has as compared to village B.

(iv) What is the total number of tractors in all the five villages?

Answer 4:

(i) Village D (ii) Village C (iii) 3 (iv) 28

Question 5:

The number of girl students in each class of a co-educational middle school is depicted by the pictograph.

Classes	Number of girl students - 4 Girls
I	
II	
III	
IV	
V	
VI	
VII	
VIII	

Observe this pictograph and answer the following questions:

(a) Which class has the minimum number of girl students?

(b) Is the number of girls in class VI less than the number of girls in class V?

(c) How many girls are there in class VII?

Answer 5:

(a) Class VIII (b) No (c) 3 × 4 = 12 girls

Question 6:

The sale of electric bulbs on different days of a week is shown below:

Days	Number of electric bulbs  - 2 Bulbs
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	
Sunday	

Observe the pictograph and answer the following questions:

(a) How many bulbs were sold on Friday?

(b) On which day were the maximum number of bulbs sold?

(c) On which of the days same number of bulbs were sold?

(d) On which of the days minimum number of bulbs were sold?

(e) If one big carton can hold 9 bulbs. How many cartons were needed in the given week?

Answer 6:

(a) Number of bulbs sold on Friday are 14.

(b) Maximum number of bulbs (18) were sold on Sunday.

(c) Same number of bulbs (8) were sold on Wednesday and Saturday.

(d) Then minimum number of bulbs (8) were sold on Wednesday and Saturday.

(e) The total number of bulbs sold in the given week were 86.

So the number of carton required to hold 86 bulb = 86/9 ≈10.

Hence, 10 cartons required to hold the bulbs.

Question 7:

In a village six fruit merchants sold the following number of fruit baskets in a particular season:

Name of fruit merchants	Number of fruit baskets - 100 Fruit baskets
Rahim	
Lakhanpal	
Anwar	
Martin	
Ranjit Singh	
Joseph	

Observe this pictograph and answer the following questions:

(a) Which merchant sold the maximum number of baskets?

(b) How many fruit baskets were sold by Anwar?

(c) The merchants who have sold 600 or more number of baskets are planning to buy a godown for the next season. Can you name them?

Answer 7:

(a) Martin

(b) 7 × 100 = 700 fruit basket

(c) Anwar, Martin, Ranjit Singh

Exercise 9.2

Question 1:

Total number of animals in five villages are as follows:

Village A	:	80	Village B	:	120
Village C	:	90	Village D	:	40
Village E	:	60			

Prepare a pictograph of these animals using one symbol ⊗ to represent 10 animals and answer the following questions:

(a) How many symbols represent animals of village E?

(b) Which village has the maximum number of animals?

(c) Which village has more animals: village A or village C?

Answer 1:

10 animals = ⊗

Village A	⊗⊗⊗⊗⊗⊗⊗⊗	80
Village B	⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗⊗	120
Village C	⊗⊗⊗⊗⊗⊗⊗⊗⊗	90
Village D	⊗⊗⊗⊗	40
Village E	⊗⊗⊗⊗⊗⊗	60

(a) 6

(b) Village B

(c) Village C has more animals than Village A

Question 2:

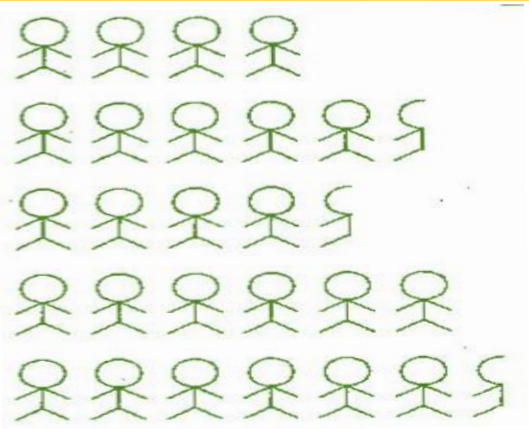
Total number of students of a school in different years is shown in the following table:

Years	Number of students
1996	400
1998	535
2000	472
2002	600
2004	623

A. Prepare a pictograph of students using one symbol  to represent 100 students and answer the following questions:
   (a) How many symbols represent total number of students in the year 2002?
   (b) How many symbols represent total number of students for the year 1998?

B. Prepare another pictograph of students using any other symbol each representing 50 students. Which pictograph do you find more informative?

Answer 2:

Years	100 students = 
1996	
1998	
2000	
2002	
2004	

(a) 6

(b) Five completed and one incomplete.

B.

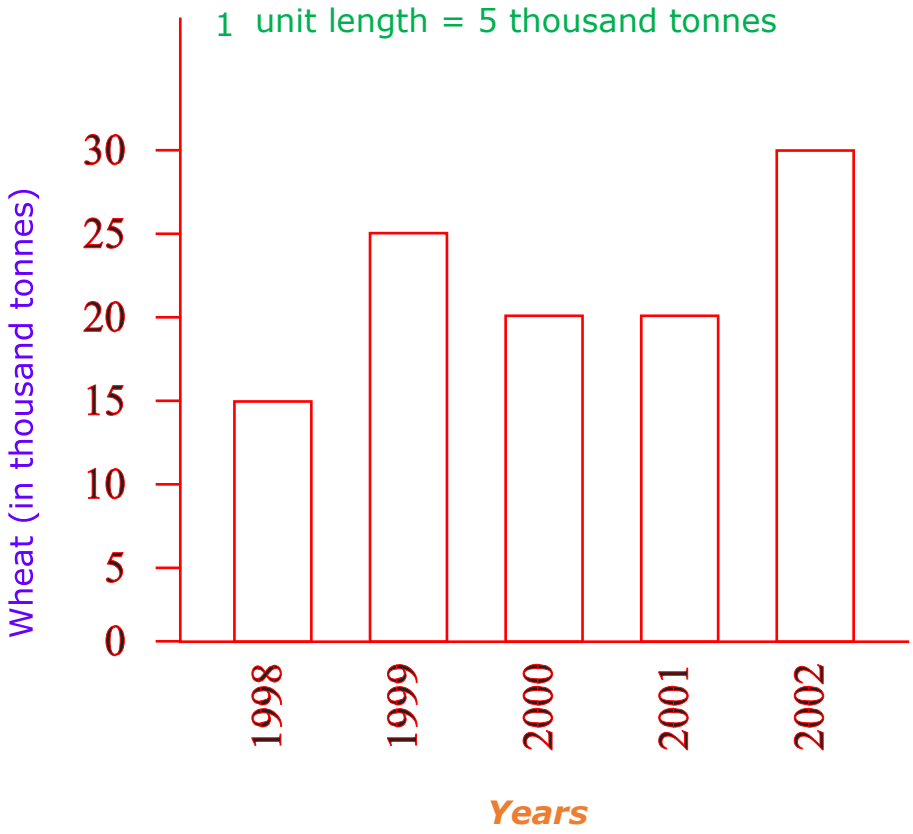
Years	50 students = △
1996	
1998	
2000	
2002	
2004	

Pictograph B is more informative than A.

Exercise 9.3

Question 1:

The bar graph given below shows the amount of wheat purchased by government during the year 1998 – 2002.



Read the bar graph and write down your observations.

(a) In which year was the wheat production maximum?

(b) In which year was the wheat production minimum?

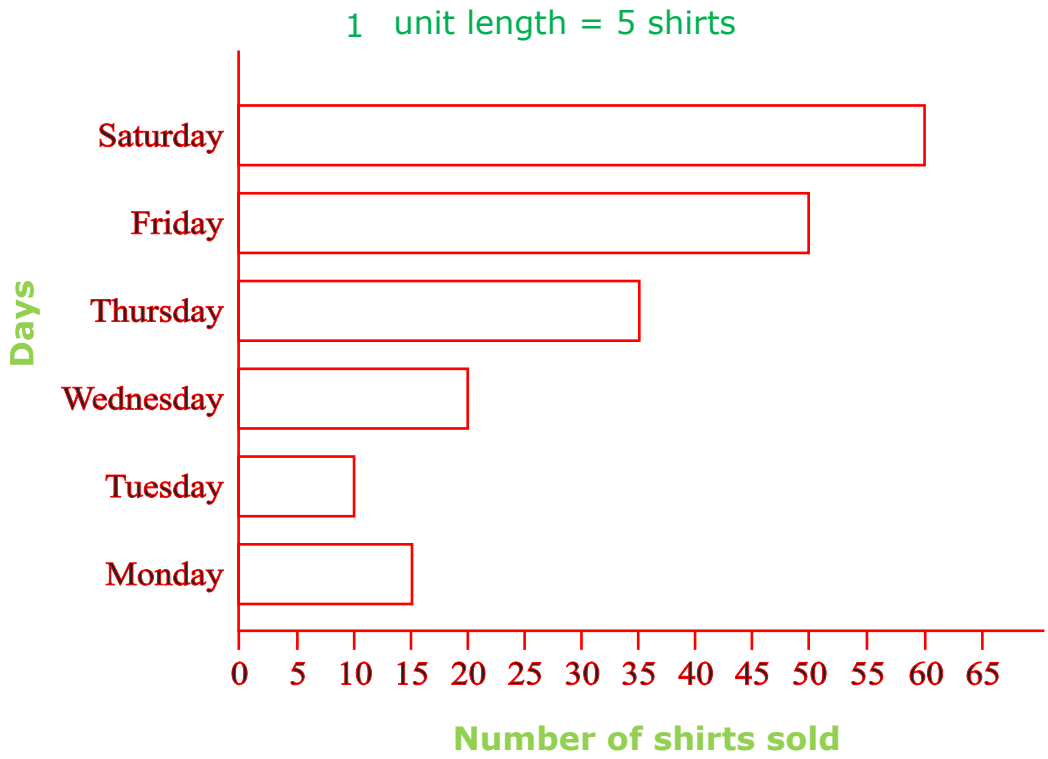
Answer 1:

(a) In 2002, production of wheat was maximum.

(b) In 1998, production of wheat was minimum.

Question 2:

Observe this bar graph which is showing the sale of shirts in a readymade shop from Monday to Saturday.



Now answer the following questions:

(a) What information does the above bar graph give?

(b) What is the scale chosen on the horizontal line representing number of shirts?

(c) On which day were the maximum number of shirts sold? How many shirts were sold on that day?

(d) On which day were the minimum number of shirts sold?

(e) How many shirts were sold on Thursday?

Answer 2:

(a) The bar graph shows the sale of shirt in a readymade shop from Monday to Saturday.

(b) 1 unit = 5 shirts

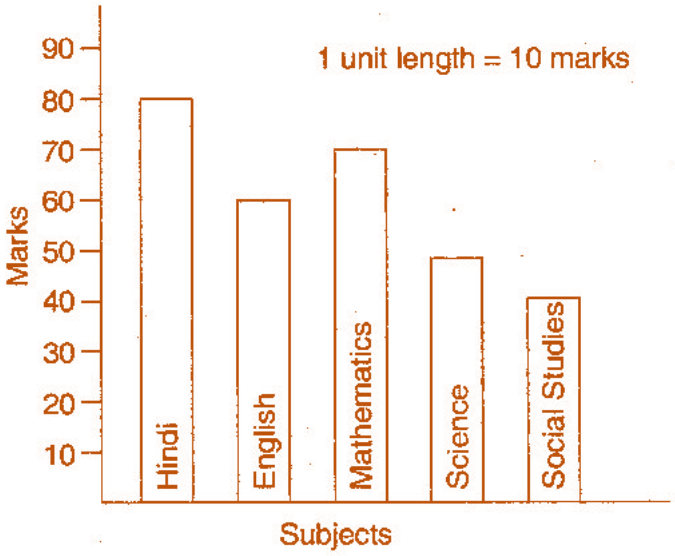
(c) On Saturday, maximum number of shirts, 60 shirts were sold.

(d) On Tuesday, minimum number of shirts were sold.

(e) On Tuesday, 35 shirts were sold.

Question 3:

Observe this bar graph which shows the marks obtained by Aziz in half yearly examination in different subjects:



Answer the given questions:

(a) What information is does the bar graph give?

(b) Name the subject in which Aziz scored maximum marks.

(c) Name the subject in which he has scored minimum marks.

(d) State the name of the subjects and marks obtained in each of them.

Answer 3:

(a) The bar graph shows the marks obtained by Aziz in half yearly examination in different subjects.

(b) Hindi.

(c) Social Studies.

(d) Hindi 80, English 60, Mathematics 70, Science 50, Social Studies 40.

Exercise 9.4

Question 1:

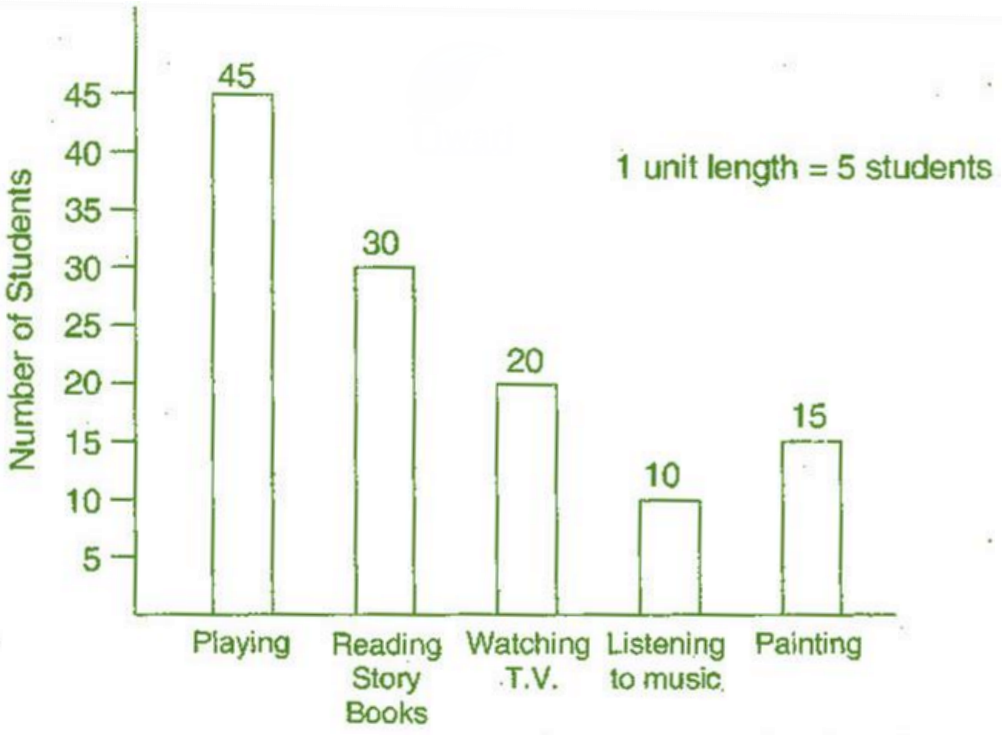
A survey of 120 school students was done to find which activity they prefer to do in their free time:

Preferred activity	Number of students
Playing	45
Reading story books	30
Watching TV	20
Listening to music	10
Painting	15

Draw a bar graph to illustrate the above data taking scale of 1 unit length = 5 students.

Which activity is preferred by most of the students other than playing?

Answer 1:



Reading story books is preferred by most of the students other than playing.

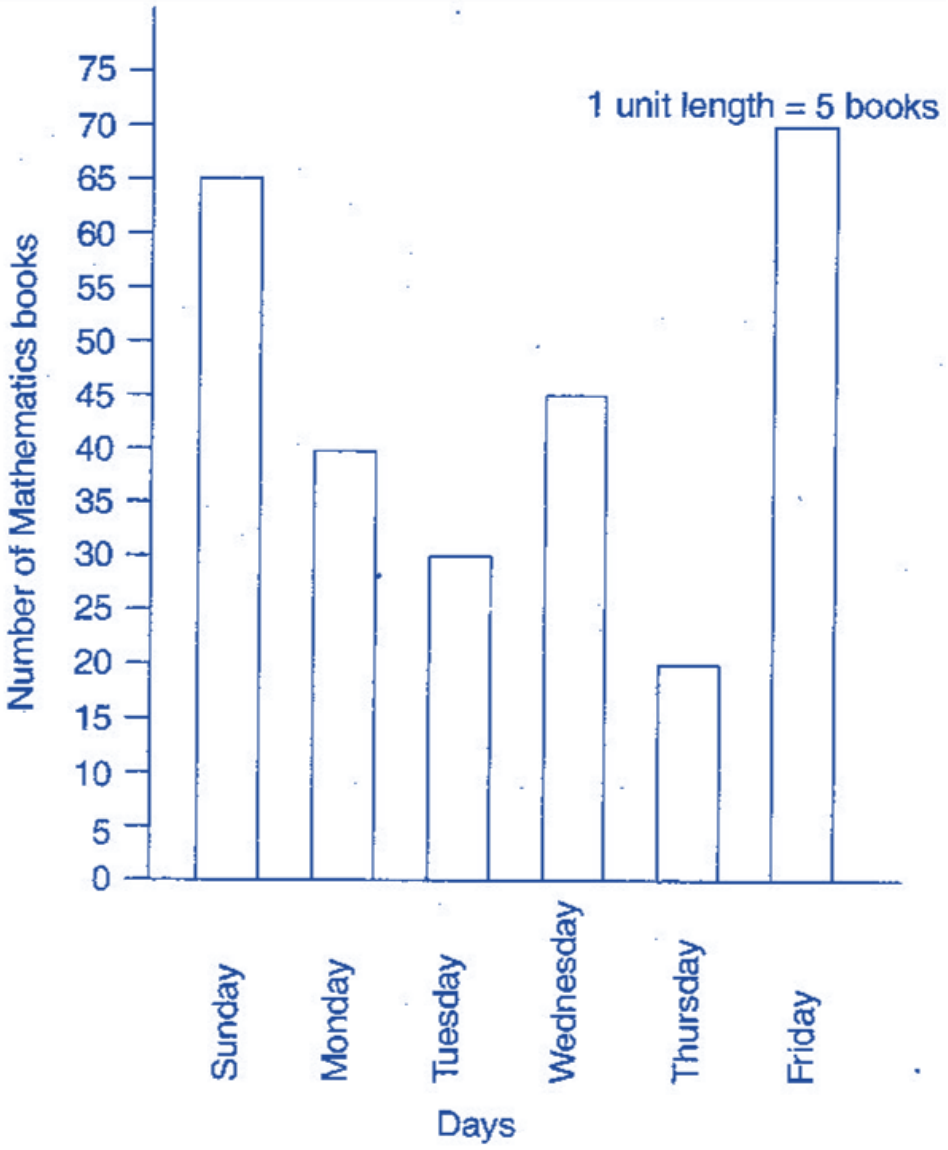
Question 2:

The number of mathematics books sold by a shopkeeper on six consecutive days is shown below:

Days	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
No. of books sold	65	40	30	50	20	70

Draw a bar graph to represent the above information choosing the scale of your choice.

Answer 2:



Question 3:

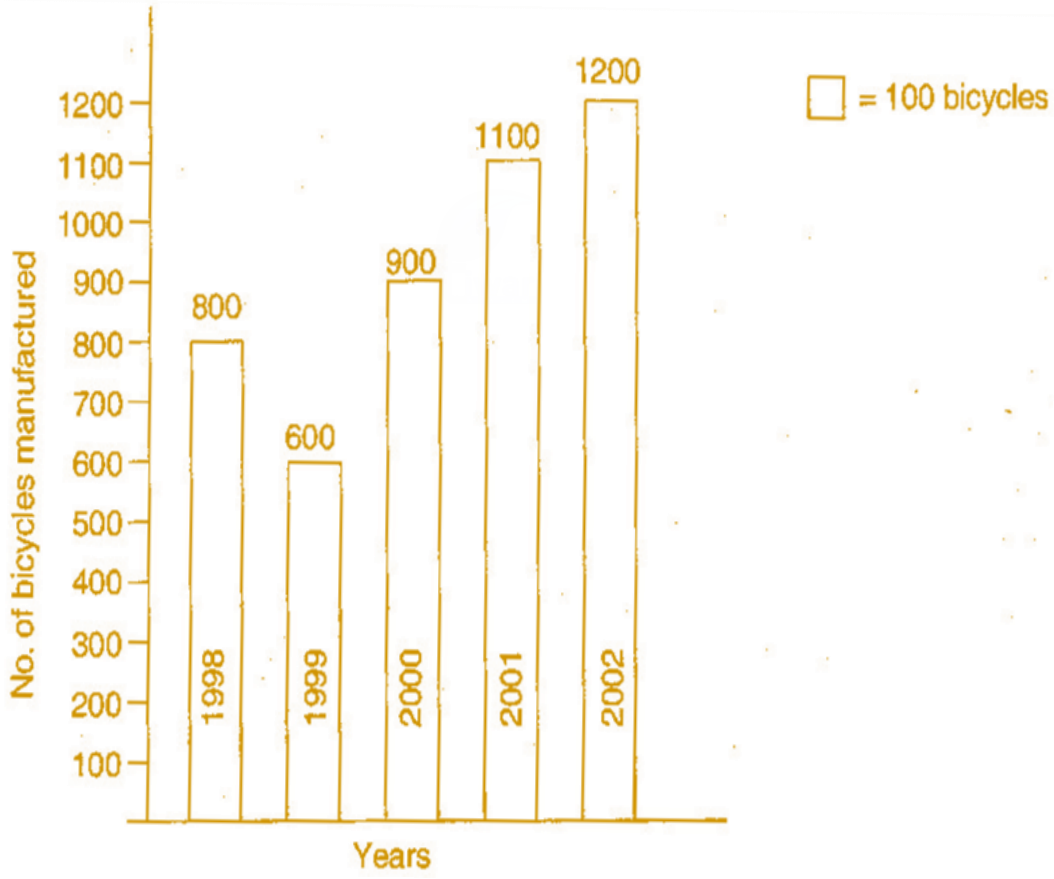
Following shows the number of bicycles manufactured in a factory during the year 1998 to 2002. Illustrate this data using a bar graph. Choose a scale your choice.

Years	Number of bicycles manufactured
1998	800
1999	600
2000	900
2001	1100
2002	1200

(a) In which year were the maximum number of bicycles manufactures?

(b) In which year were the minimum number of bicycles manufactured?

Answer 3:



(a) The maximum number of bicycles manufactures in 2002.

(b) The minimum number of bicycles manufactured in 1999.

Question 4:

Number of persons in various age groups in a town is given in the following table:

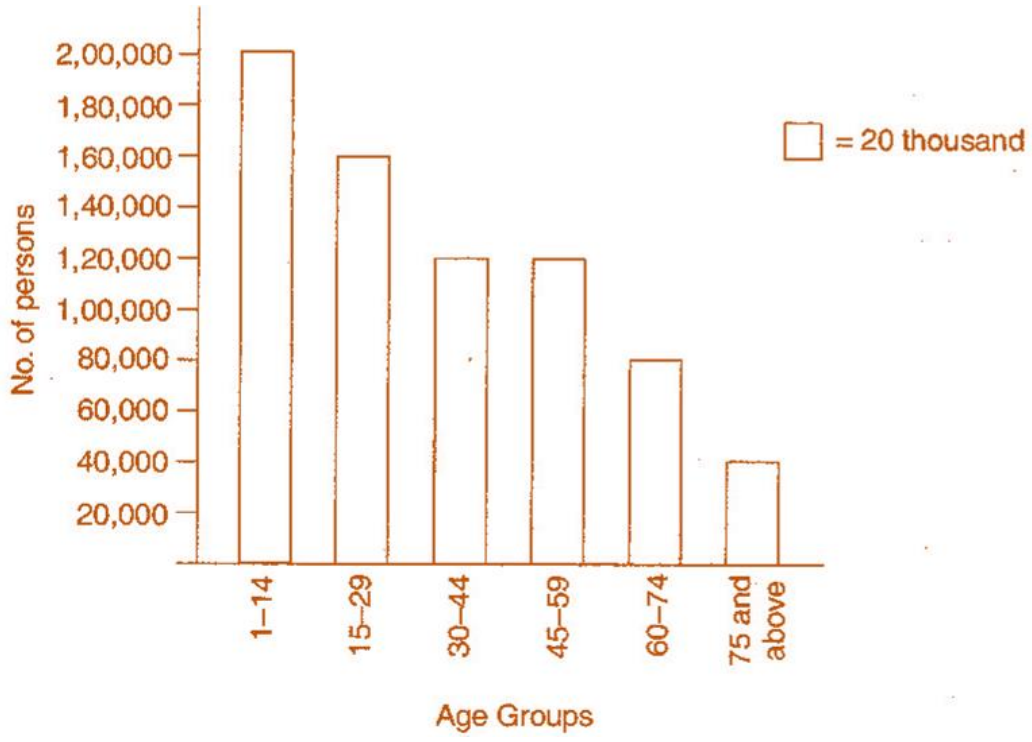
Age Group	Number of persons
1 – 14	2 Lakhs
15 – 29	1 lakh 60 thousands
30 – 44	1 lakh 20 thousands
45 – 59	1 lakh 20 thousands
60 – 74	80 thousands
75 and above	40 thousands

Draw a bar graph to represent the above information and answer the following questions. (Take 1 unit length = 20 thousands)

(a) Which two age groups have same population?

(b) All persons in the age group of 60 and above are called senior citizens. How many senior citizens are there in the town?

Answer 4:



(a) Group 30 – 44 and group 45 – 59 have same population.

(b) 80,000 + 40,000 = 1,20,000 senior citizens are there in the town.

Mathematics

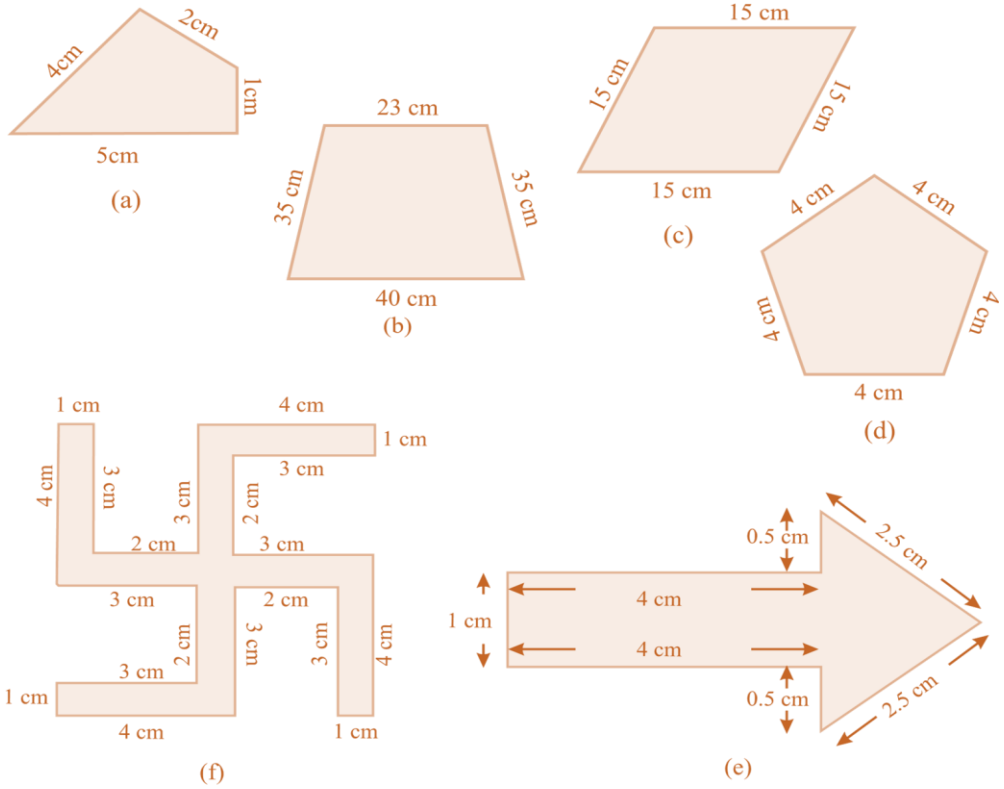
(Chapter – 10) (Mensuration)

(Class – VI)

Exercise 10.1

Question 1:

Find the perimeter of each of the following figures:



Answer 1:

(a) Perimeter = Sum of all the sides

= 4 cm + 2 cm + 1 cm + 5 cm = 12 cm

(b) Perimeter = Sum of all the sides

= 23 cm + 35 cm + 40 cm + 35 cm = 133 cm

(a) Perimeter = Sum of all the sides

= 15 cm + 15 cm + 15 cm + 15 cm = 60 cm

(b) Perimeter = Sum of all the sides

= 4 cm + 4 cm + 4 cm + 4 cm + 4 cm = 20 cm

(c) Perimeter = Sum of all the sides

1 cm + 4 cm + 0.5 cm + 2.5 cm + 2.5 cm + 0.5 cm + 4 cm = 15 cm

(d) Perimeter = Sum of all the sides

= 4 cm + 1 cm + 3 cm + 2 cm + 3 cm + 4 cm + 1 cm + 3 cm + 2 cm + 3 cm + 4 cm + 1 cm + 3 cm + 2 cm + 3 cm + 4 cm + 1 cm + 3 cm + 2 cm + 3 cm = 52 cm

Question 2:

The lid of a rectangular box of sides 40 cm by 10 cm is sealed all round with tape. What is the length of the tape required?

Answer 2:

Total length of tape required = Perimeter of rectangle
= 2 (length + breadth)
= 2 (40 + 10)
= 2 x 50
= 100 cm
= 1 m

Thus, the total length of tape required is 100 cm or 1 m.

Question 3:

A table-top measures 2 m 25 cm by 1 m 50 cm. What is the perimeter of the table-top?

Answer 3:

Length of table top = 2 m 25 cm = 2.25 m
Breadth of table top = 1 m 50 cm = 1.50 m
Perimeter of table top = 2 x (length + breadth)
= 2 x (2.25 + 1.50)
= 2 x 3.75
= 7.50 m

Thus, the perimeter of table top is 7.5 m.

Question 4:

What is the length of the wooden strip required to frame a photograph of length and breadth 32 cm and 21 cm respectively?

Answer 4:

Length of wooden strip = Perimeter of photograph
Perimeter of photograph = 2 x (length + breadth)
= 2 (32 + 21)
= 2 x 53 cm
= 106 cm

Thus, the length of the wooden strip required is equal to 106 cm.

Question 5:

A rectangular piece of land measures 0.7 km by 0.5 km. Each side is to be fenced with 4 rows of wires. What is the length of the wire needed?

Answer 5:

Since the 4 rows of wires are needed.

Therefore the total length of wires is equal to 4 times the perimeter of rectangle.

Perimeter of field = 2 x (length + breadth)

= 2 x (0.7 + 0.5)

= 2 x 1.2

= 2.4 km

= 2.4 x 1000 m

= 2400 m

Thus, the length of wire = 4 x 2400 = 9600 m = 9.6 km

Question 6:

Find the perimeter of each of the following shapes:

(a) A triangle of sides 3 cm, 4 cm and 5 cm.

(b) An equilateral triangle of side 9 cm.

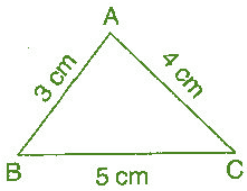
(c) An isosceles triangle with equal sides 8 cm each and third side 6 cm

Answer 6:

(a) Perimeter of ΔABC = AB + BC + CA

= 3 cm + 5 cm + 4 cm

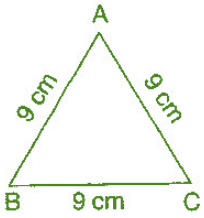
= 12 cm



(b) Perimeter of equilateral ABC = 3 x side

= 3 x 9 cm

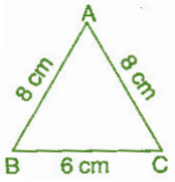
= 27 cm



(c) Perimeter of ΔABC = AB + BC + CA

= 8 cm + 6 cm + 8 cm

= 22 cm



Question 7:

Find the perimeter of a triangle with sides measuring 10 cm, 14 cm and 15 cm.

Answer 7:

Perimeter of triangle = Sum of all three sides
= 10 cm + 14 cm + 15 cm
= 39 cm

Thus, the perimeter of triangle is 39 cm.

Question 8:

Find the perimeter of a regular hexagon with each side measuring 8 cm.

Answer 8:

Perimeter of Hexagon = 6 x length of one side
= 6 x 8 m
= 48 m

Thus, the perimeter of hexagon is 48 m.

Question 9:

Find the side of the square whose perimeter is 20 m.

Answer 9:

Perimeter of square = 4 x side

$\Rightarrow$ 20 = 4 x side

$\Rightarrow$ Side = $\frac{20}{4}$ = 5 cm

Thus, the side of square is 5 cm.

Question 10:

The perimeter of a regular pentagon is 100 cm. How long is its each side?

Answer 10:

Perimeter of regular pentagon = 100 cm

$\Rightarrow$ 5 x side = 100 cm

$\Rightarrow$ Side = $\frac{100}{5}$ = 20 cm

Thus, the side of regular pentagon is 20 cm.

Question 11:

A piece of string is 30 cm long. What will be the length of each side if the string is used to form:

(a) a square (b) an equilateral triangle (c) a regular hexagon?

Answer 11:

Length of string = Perimeter of each figure

(a) Perimeter of square = 30 cm

$\Rightarrow$ 4 x side = 30 cm

$\Rightarrow$ Side = $\frac{30}{4}$ = 7.5 cm

Thus, the length of each side of square is 7.5 cm.

(b) Perimeter of equilateral triangle = 30 cm

$\Rightarrow$ 3 x side = 30 cm

$\Rightarrow$ Side = $\frac{30}{3}$ = 10 cm

Thus, the length of each side of equilateral triangle is 10 cm.

(c) Perimeter of hexagon = 30 cm

$\Rightarrow$ 6 x side = 30 cm

$\Rightarrow$ Side = $\frac{30}{6}$ = 5 cm

Thus, the side of each side of hexagon is 5 cm.

Question 12:

Two sides of a triangle are 12 cm and 14 cm. The perimeter of the triangle is 36 cm. What is the third side?

Answer 12:

Let the length of third side be x cm.

Length of other two side are 12 cm and 14 cm.

Now, Perimeter of triangle = 36 cm

$\Rightarrow$ $12+14+x=36$

$\Rightarrow$ $26+x=36$

$\Rightarrow$ $x=36-26$

$\Rightarrow$ $x=10$ cm

Thus, the length of third side is 10 cm.

Question 13:

Find the cost of fencing a square park of side 250 m at the rate of ₹20 per meter.

Answer 13:

Side of square = 250 m

Perimeter of square = 4 x side

= 4 x 250

= 1000 m

Since, cost of fencing of per meter = ₹ 20

Therefore, the cost of fencing of 1000 meters = 20 x 1000 = ₹20,000

Question 14:

Find the cost of fencing a rectangular park of length 175 m and breadth 125 m at the rate of ₹12 per meter.

Answer 14:

Length of rectangular park = 175 m

Breadth of rectangular park = 125 m

Perimeter of park = 2 x (length + breadth)

= 2 x (175 + 125)

= 2 x 300 = 600 m

Since, the cost of fencing park per meter = ₹ 12

Therefore, the cost of fencing park of 600 m = 12 x 600 = ₹ 7,200

Question 15:

Sweety runs around a square park of side 75 m. Bulbul runs around a rectangular park with length of 60 m and breadth 45 m. Who covers less distance?

Answer 15:

Distance covered by Sweety = Perimeter of square park

Perimeter of square = 4 x side

= 4 x 75 = 300 m

Thus, distance covered by Sweety is 300 m.

Now, distance covered by Bulbul = Perimeter of rectangular park

Perimeter of rectangular park = 2 x (length + breadth)

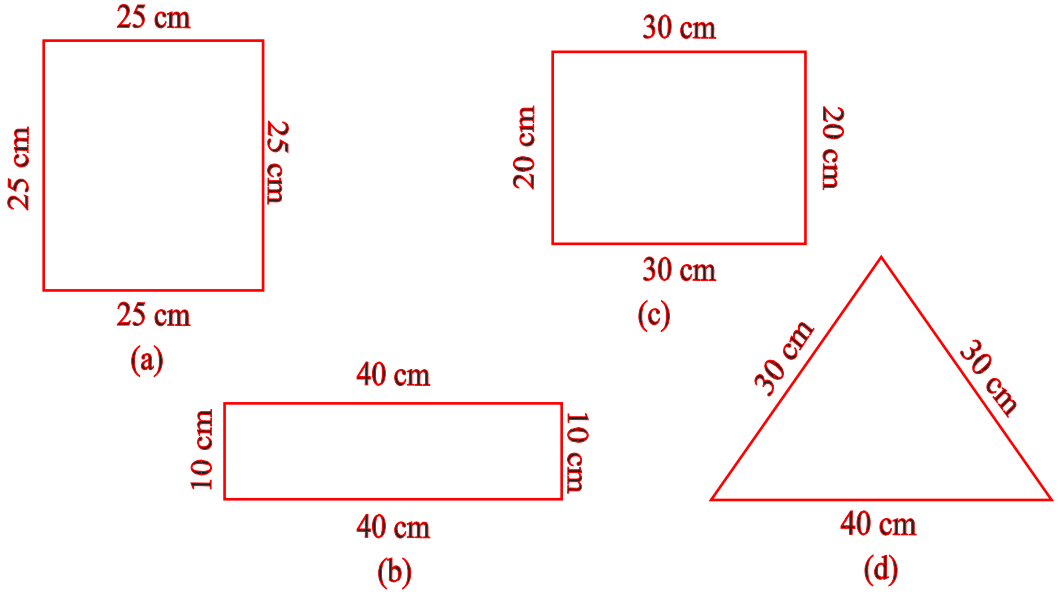
= 2 x (60 + 45)

= 2 x 105 = 210 m

Thus, Bulbul covers the distance of 210 m and Bulbul covers less distance.

Question 16:

What is the perimeter of each of the following figures? What do you infer from the answer?



Answer 16:

(a) Perimeter of square = 4 x side
= 4 x 25 = 100 cm

(b) Perimeter of rectangle = 2 x (length + breadth)
= 2 x (40 + 10)
= 2 x 50
= 100 cm

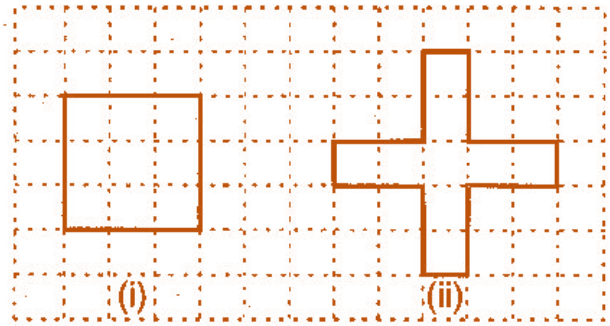
(c) Perimeter of rectangle = 2 x (length + breadth)
= 2 x (30 + 20)
= 2 x 50
= 100 cm

(d) Perimeter of triangle = Sum of all sides
= 30 cm + 30 cm + 40 cm
= 100 cm

Thus, all the figures have same perimeter.

Question 17:

Avneet buys 9 square paving slabs, each with a side $\frac{1}{2}$ m. He lays them in the form of a square



(a) What is the perimeter of his arrangement?

(b) Shari does not like his arrangement. She gets him to lay them out like a cross. What is the perimeter of her arrangement?

(c) Which has greater perimeter?

(d) Avneet wonders, if there is a way of getting an even greater perimeter. Can you find a way of doing this? (The paving slabs must meet along complete edges, i.e., they cannot be broken.)

Answer 17:

(a) 6 m

(b) 10 m

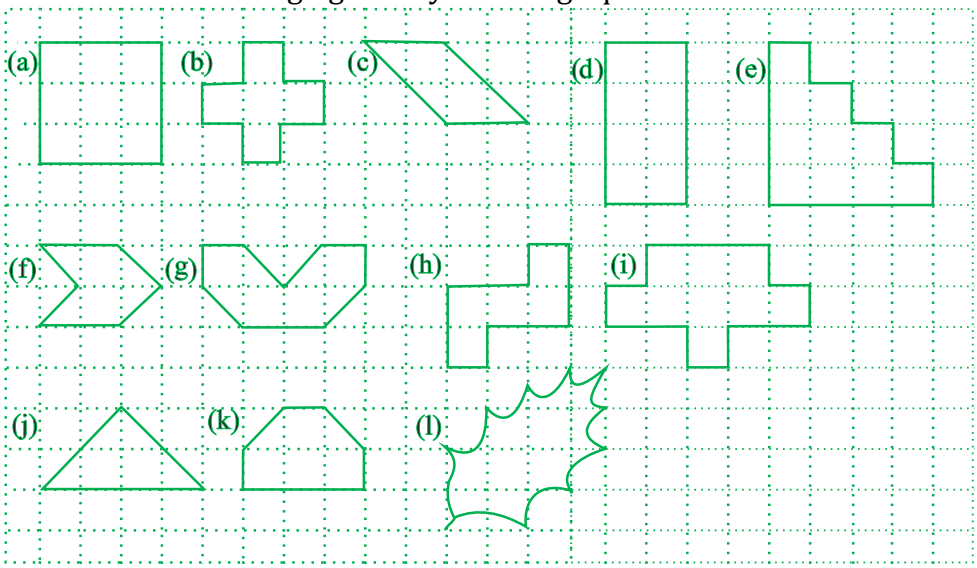
(c) Second arrangement has greater perimeter.

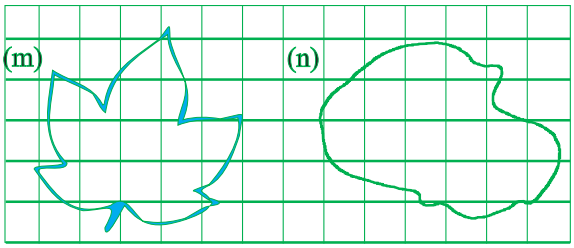
(d) Yes, if all the squares are arranged in row, the perimeter be 10 cm.

Exercise 10.2

Question 1:

Find the areas of the following figures by counting squares:





Answer 1:

(a) Number of filled square = 9

∴ Area covered by squares = 9 x 1 = 9 sq. units

(b) Number of filled squares = 5

∴ Area covered by filled squares = 5 x 1 = 5 sq. units

(c) Number of full filled squares = 2

Number of half-filled squares = 4

∴ Area covered by full filled squares = 2 x 1 = 2 sq. units

And Area covered by half-filled squares = $\cancel{4}$ x $\frac{1}{\cancel{2}}$ = 2 sq. units

∴ Total area = 2 + 2 = 4 sq. units

(d) Number of filled squares = 8
∴ Area covered by filled squares = 8 x 1 = 8 sq. units

(a) Number of filled squares = 10
∴ Area covered by filled squares = 10 x 1 = 10 sq. units

(b) Number of full filled squares = 2
Number of half-filled squares = 4
∴ Area covered by full filled squares = 2 x 1 = 2 sq. units
And Area covered by half-filled squares = $\cancel{4}$ x $\frac{1}{\cancel{2}}$ = 2 sq. units
∴ Total area = 2 + 2 = 4 sq. units

(c) Number of full filled squares = 4
Number of half-filled squares = 4
∴ Area covered by full filled squares = 4 x 1 = 4 sq. units
And Area covered by half-filled squares = $\cancel{4}$ x $\frac{1}{\cancel{2}}$ = 2 sq. units
∴ Total area = 4 + 2 = 6 sq. units

(d) Number of filled squares = 5
∴ Area covered by filled squares = 5 x 1 = 5 sq. units

(e) Number of filled squares = 9
∴ Area covered by filled squares = 9 x 1 = 9 sq. units

(f) Number of full filled squares = 2
Number of half-filled squares = 4
∴ Area covered by full filled squares = 2 x 1 = 2 sq. units
And Area covered by half-filled squares = $\cancel{4}$ x $\frac{1}{\cancel{2}}$ = 2 sq. units
∴ Total area = 2 + 2 = 4 sq. units

(g) Number of full filled squares = 4
Number of half-filled squares = 2
∴ Area covered by full filled squares = 4 x 1 = 4 sq. units

And Area covered by half-filled squares = $\cancel{2}$ x $\frac{1}{\cancel{2}}$ = 1 sq. units

∴ Total area = 4 + 1 = 5 sq. units

(h) Number of full filled squares = 3

Number of half-filled squares = 10

∴ Area covered by full filled squares = 3 x 1 = 3 sq. units

And Area covered by half-filled squares = $\cancel{10}$ x $\frac{1}{\cancel{2}}$ = 5 sq. units

∴ Total area = 3 + 5 = 8 sq. units

(i) Number of full filled squares = 7

Number of half-filled squares = 14

∴ Area covered by full filled squares = 7 x 1 = 7 sq. units

And Area covered by half-filled squares = $\cancel{14}$ x $\frac{1}{\cancel{2}}$ = 7 sq. units

∴ Total area = 7 + 7 = 14 sq. units

(j) Number of full filled squares = 10

Number of half-filled squares = 16

∴ Area covered by full filled squares = 10 x 1 = 10 sq. units

And Area covered by half-filled squares = $\cancel{16}$ x $\frac{1}{\cancel{2}}$ = 8 sq. units

∴ Total area = 10 + 8 = 18 sq. units

Exercise 10.3

Question 1:

Find the areas of the rectangles whose sides are:

(a) 3 cm and 4 cm (b) 12 m and 21 m

(c) 2 km and 3 km (d) 2 m and 70 cm

Answer 1:

(a) Area of rectangle = length x breadth
= 3 cm x 4 cm = 12 cm^2

(b) Area of rectangle = length x breadth
= 12 m x 21 m = 252 m^2

(c) Area of rectangle = length x breadth
= 2 km x 3 km = 6 km^2

(d) Area of rectangle = length x breadth
= 2 m x 70 cm = 2 m x 0.7 m = 1.4 m^2

Question 2:

Find the areas of the squares whose sides are:

(a) 10 cm (b) 14 cm (c) 5 cm

Answer 2:

(a) Area of square = side x side = 10 cm x 10 cm = 100 cm^2

(b) Area of square = side x side = 14 cm x 14 cm = 196 cm^2

(c) Area of square = side x side = 5 m x 5 m = 25 m^2

Question 3:

The length and the breadth of three rectangles are as given below:

(a) 9 m and 6 m (b) 17 m and 3 m (c) 4 m and 14 m

Which one has the largest area and which one has the smallest?

Answer 3:

(a) Area of rectangle = length x breadth = 9 m x 6 m = 54 m^2

(b) Area of rectangle = length x breadth= 3 m x 17 m = 51 m^2

(c) Area of rectangle = length x breadth= 4 m x 14 m = 56 m^2

Thus, the rectangle (c) has largest area, and rectangle (b) has smallest area.

Question 4:

The area of a rectangle garden 50 m long is 300 m^2, find the width of the garden.

Answer 4:

Length of rectangle = 50 m and Area of rectangle = 300 m^2

Since, Area of rectangle = length x breadth

Therefore, $\text{Breadth} = \frac{\text{Area of rectangle}}{\text{Length}} = \frac{\cancel{300}}{\cancel{50}} = 6$ m

Thus, the breadth of the garden is 6 m.

Question 5:

What is the cost of tilling a rectangular plot of land 500 m long and 200 m wide at the rate of ₹8 per hundred sq. m?

Answer 5:

Length of land = 500 m and Breadth of land = 200 m

Area of land = length x breadth = 500 m x 200 m = 1,00,000 m^2

∵ Cost of tilling 100 sq. m of land = ₹ 8

∴ Cost of tilling 1,00,000 sq. m of land = $\frac{8 \times 1000\cancel{00}}{1\cancel{00}}$ = ₹ 8000

Question 6:

A table-top measures 2 m by 1 m 50 cm. What is its area in square meters?

Answer 6:

Length of table = 2 m

Breadth of table = 1 m 50 cm = 1.50 m

Area of table = length x breadth

= 2 m x 1.50 m = 3 m^2

Question 7:

A room us 4 m long and 3 m 50 cm wide. How many square meters of carpet is needed to cover the floor of the room?

Answer 7:

Length of room = 4 m

Breadth of room = 3 m 50 cm = 3.50 m

Area of carpet = length x breadth

= 4 x 3.50 = 14m^2

Question 8:

A floor is 5 m long and 4 m wide. A square carpet of sides 3 m is laid on the floor. Find the area of the floor that is not carpeted.

Answer 8:

Length of floor = 5 m and breadth of floor = 4 m

Area of floor = length x breadth

= 5 m x 4 m = 20 m^2

Now, Side of square carpet = 3 m

Area of square carpet = side x side = 3 x 3 = 9 m^2

Area of floor that is not carpeted = 20 m^2 – 9 m^2 = 11 m^2

Question 9:

Five square flower beds each of sides 1 m are dug on a piece of land 5 m long and 4 m wide. What is the area of the remaining part of the land?

Answer 9:

Side of square bed = 1 m

Area of square bed = side x side = 1 m x 1 m = 1 m^2

∴ Area of 5 square beds = 1 x 5 = 5 m^2

Now, Length of land = 5 m

Breadth of land = 4 m

∴ Area of land = length x breadth

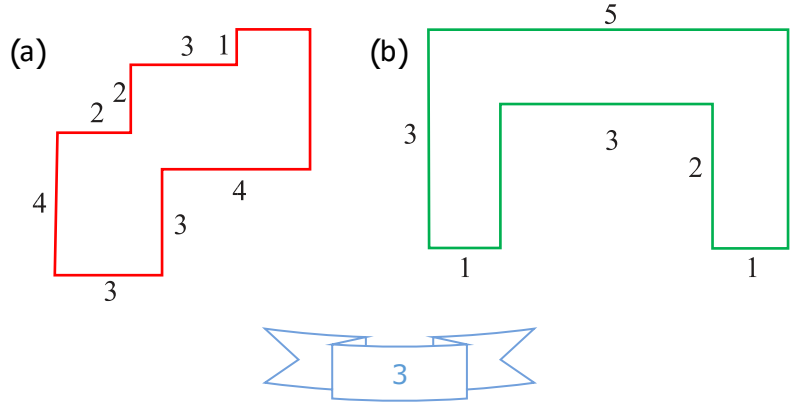
= 5 m x 4 m = 20 m^2

Area of remaining part = Area of land – Area of 5 flower beds

= 20 m^2 – 5 m^2 = 15 m^2

Question 10:

By splitting the following figures into rectangles, find their areas. (The measures are given in centimetres)



Answer 10:

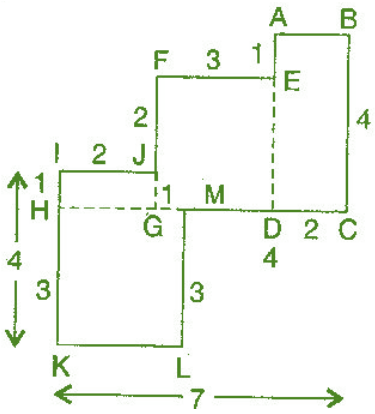
(a) Area of HKLM = 3 x 3 = 9 cm^2

Area of IJGH = 1 x 2 = 2 cm^2

Area of FEDG = 3 x 3 = 9 cm^2

Area of ABCD = 2 x 4 = 8 cm^2

Total area of the figure = 9 + 2 + 9 + 8 = 28 cm^2

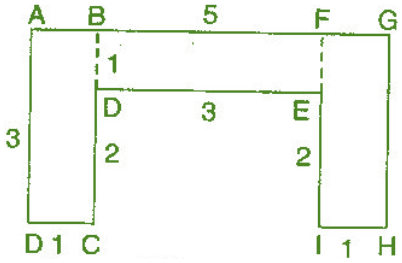


(b) Area of ABCD = 3 x 1 = 3 cm^2

Area of BDEF = 3 x 1 = 3 cm^2

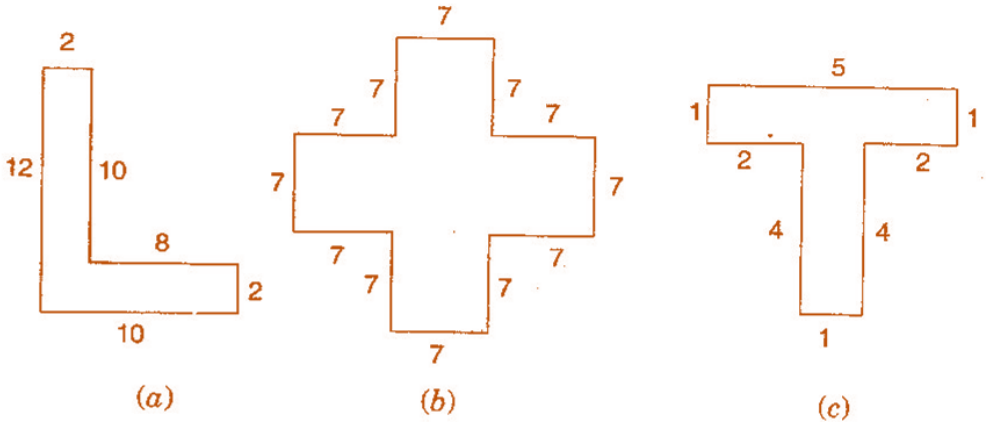
Area of FGHI = 3 x 1 = 3 cm^2

Total area of the figure = 3 + 3 + 3 = 9 cm^2



Question 11:

Split the following shapes into rectangles and find their areas. (The measures are given in centimetres)

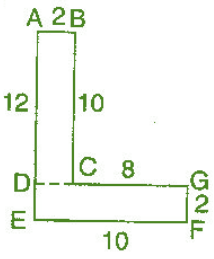


Answer 11:

(a) Area of rectangle ABCD = 2 x 10 = 20 cm^2

Area of rectangle DEFG = 10 x 2 = 20 cm^2

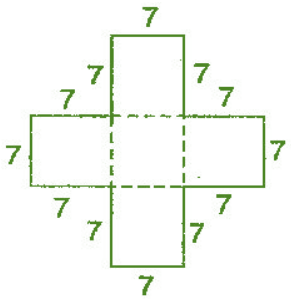
Total area of the figure = 20 + 20 = 40 cm^2



(b) There are 5 squares each of side 7 cm.

Area of one square = 7 x 7 = 49 cm^2

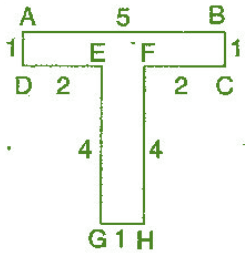
Area of 5 squares = 49 x 5 = 245 cm^2



(c) Area of rectangle ABCD = 5 x 1 = 5 cm^2

Area of rectangle EFGH = 4 x 1 = 4 cm^2

Total area of the figure = 5 + 4 cm^2



Question 12:

How many tiles whose length and breadth are 12 cm and 5 cm respectively will be needed to fit in a rectangular region whose length and breadth are respectively?

(a) 100 cm and 144 cm

(b) 70 cm and 36 cm

Answer 12:

(a) Area of region = 100 cm x 144 cm = 14400 cm^2

Area of one tile = 5 cm x 12 cm = 60 cm^2

$$\text{Number of tiles} = \frac{\text{Area of region}}{\text{Area of one tile}}$$

$$= \frac{\cancel{14400}}{\cancel{60}} = 240$$

Thus, 240 tiles are required.

(b) Area of region = 70 cm x 36 cm = 2520 cm^2

Area of one tile = 5 cm x 12 cm = 60 cm^2

$$\text{Number of tiles} = \frac{\text{Area of region}}{\text{Area of one tile}}$$

$$= \frac{\cancel{2520}}{\cancel{60}} = 42$$

Thus, 42 tiles are required.

Mathematics

(Chapter – 11) (Algebra)

(Class – VI)

Exercise 11.1

Question 1:

Find the rule, which gives the number of matchsticks required to make the following matchsticks patterns. Use a variable to write the rule.

(a) A pattern of letter T as 

(b) A pattern of letter Z as 

(c) A pattern of letter U as 

(d) A pattern of letter V as 

(e) A pattern of letter E as 

(f) A pattern of letter S as 

(g) A pattern of letter A as 

Answer 1:

(a) Pattern of letter  = $2n$ (as two matchstick used in each letter)

(b) Pattern of letter  = $3n$ (as three matchstick used in each letter)

(c) Pattern of letter  = $3n$ (as three matchstick used in each letter)

(d) Pattern of letter  = $2n$ (as two matchstick used in each letter)

(e) Pattern of letter  = $5n$ (as five matchstick used in each letter)

(f) Pattern of letter  = $5n$ (as five matchstick used in each letter)

(g) Pattern of letter  = $6n$ (as six matchstick used in each letter)

Question 2:

We already know the rule for the pattern of letter L, C and F. Some of the letters from Q.1 (given above) give us the same rule as that given by L. Which are these? Why does this happen?

Answer 2:

The letter 'T' and 'V' that has pattern $2n$, since 2 matchsticks are used in all these letters.

Question 3:

Cadets are marching in a parade. There are 5 cadets in a row. What is the rule, which gives the number of cadets, given the number of rows? (Use n for the number of rows)

Answer 3:

Number of rows = n

Cadets in each row = 5

Therefore, total number of cadets = $5n$

Question 4:

If there are 50 mangoes in a box, how will you write the total number of mangoes in terms of the number of boxes? (Use b for the number of boxes)

Answer 4:

Number of boxes = b

Number of mangoes in each box = 50

Therefore, total number of mangoes = $50b$

Question 5:

The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students)

Answer 5:

Number of students = s

Number of pencils to each student = 5

Therefore, total number of pencils needed are = $5s$

Question 6:

A bird flies 1 kilometer in one minute. Can you express the distance covered by the bird in terms of its flying time in minutes? (Use t for flying time in minutes)

Answer 6:

Time taken by bird = t minutes

Speed of bird = 1 km per minute

Therefore, Distance covered by bird = speed x time = $1 \times t = t$ km

Question 7:

Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder as in figure). She has 8 dots in a row. How many dots will her Rangoli have for r rows? How many dots are there if there are 8 rows? If there are 10 rows?

Answer 7:

Number of dots in each row = 8 dots

Number of rows = r

Therefore, number of dots = $8r$

When there are 8 rows, then number of dots = 8 x 8 = 64 dots

When there are 10 rows, then number of dots = 8 x 10 = 80 dots

Question 8:

Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms of Radha's age? Take Radha's age to be x years.

Answer 8:

Radha's age = x years

Therefore, Leela's age = $(x-4)$ years

Question 9:

Mother has made laddus. She gives some laddus to guests and family members; still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?

Answer 9:

Number of laddus gave away = l

Number of laddus remaining = 5

Total number of laddus = $(l+5)$

Question 10:

Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still 10 oranges remain outside. If the number of oranges in a small box are taken to be x, what is the number of oranges in the larger box?

Answer 10:

Number of oranges in one box = x

Number of boxes = 2

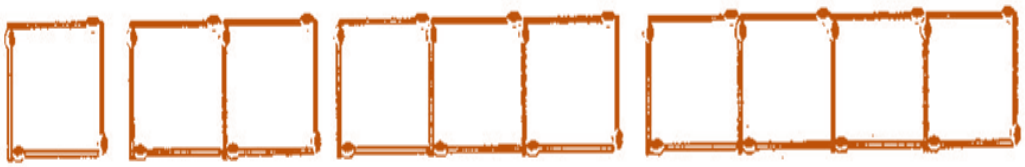
Therefore, total number of oranges in boxes = $2x$

Remaining oranges = 10

Thus, number of oranges = $2x+10$

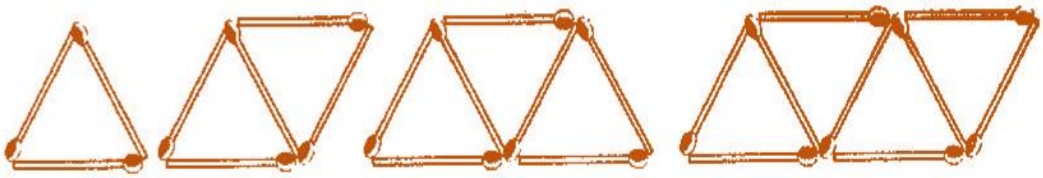
Question 11:

(a) Look at the following matchstick pattern of squares. The squares are not separate. Two neighbouring squares have a common matchstick. Observe the patterns and find the rule that gives the number of matchsticks in terms of the number of squares. (**Hint**: If you remove the vertical stick at the end, you will get a pattern of Cs.)



(a) (b) (c) (d)

(b) Figs. Below gives a matchstick pattern of triangles. As in Exercise 11 (a) above find the general rule that gives the number of matchsticks in terms of the number of triangles.



(a) (b) (c) (d)

Answer 11:

(a)

4 matchsticks

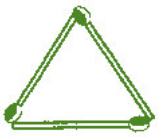
7 matchsticks

10 matchsticks

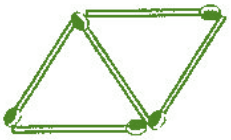
13 matchsticks

If we remove 1 from each then they makes table of 3, i.e., 3, 6, 9, 12…
So the required equation = $3x+1$, where x is number of squares.

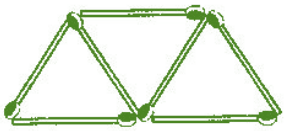
(b)



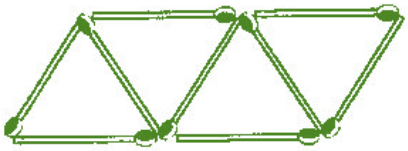
3 matchsticks



7 matchsticks



10 matchsticks



13 matchsticks

If we remove 1 from each then they makes table of 2, i.e., 2, 4, 6, 8…
So the required equation = $2x+1$, where x is number of triangles.

Exercise 11.2

Question 1:

The side of an equilateral triangle is shown by l. Express the perimeter of the equilateral triangle using l.

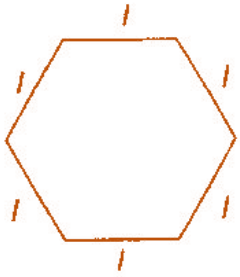
Answer 1:

Side of equilateral triangle = l

Therefore, Perimeter of equilateral triangle = 3 x side = $3l$

Question 2:

The side of a regular hexagon is denoted by l. Express the perimeter of the hexagon using l. (**Hint**: A regular hexagon has all its six sides in length)



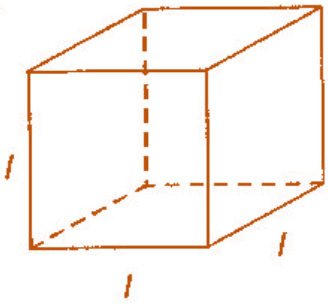
Answer 2:

Side of hexagon = l

Therefore, Perimeter of Hexagon = 6 x side = $6l$

Question 3:

A cube is a three-dimensional figure. It has six faces and all of them are identical squares. The length of an edge of the cube is given by l. find the formula for the total length of the edges of a cube.



Answer 3:

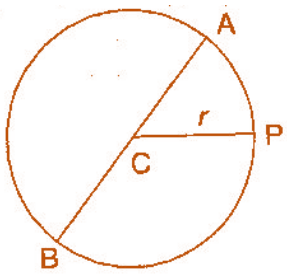
Length of one edge of cube = l

Number of edges in a cube = 12

Therefore, total length = $12 \times l = 12l$

Question 4:

The diameter of a circle is a line, which joins two points on the circle and also passes through the centre of the circle. (In the adjoining figure AB is a diameter of the circle; C is its centre). Express the diameter of the circle (d) in terms of its radius (r).



Answer 4:

Since, length of diameter is double the length of radius.

Therefore, $d = 2r$

Question 5:

To find sum of three numbers 14, 27 and 13. We can have two ways.

(a) We may first add 14 and 27 to get 41 and then add 13 to it to get the total sum 54, or

(b) We may add 27 and 13 to get 40 and then add 14 to get the sum 54. Thus

(14 + 27) + 13 = 14 + (27 + 13)

This can be done for any three numbers. This property is known as the associativity of addition of numbers. Express this property which we have already studied in the chapter on Whole Numbers, in a general way, by using variables a, b and c.

Answer 5:

$(a+b)+c = a+(b+c)$

Exercise 11.3

Question 1:

Make up as many expressions with numbers (no variables) as you can from three numbers 5, 7 and 8. Every number should be used not more than once. Use only addition, subtraction and multiplication.

(**Hint**: Three possible expressions are 5 + (8 – 7), 5 – (8 – 7), (5 x 8) + 7 make the other expressions)

Answer 1:

(a) (8 x 5) – 7
(b) (8 + 5) – 7
(c) (8 x 7) – 5
(d) (8 + 7) – 5
(e) 5 x (7 + 8)
(f) 5 + (7 x 8)
(g) 5 + (8 – 7)
(h) 5 – (7 + 8)

Question 2:

Which out of the following are expressions with numbers only:

(a) $y+3$
(b) $(7\times 20)-8z$
(c) $5(21-7)+7\times 2$
(d) 5
(e) $3x$
(f) $5-5n$
(g) $(7\times 20)-(5\times 10)-45+p$

Answer 2:

(c) and (d)

Question 3:

Identify the operations (addition, subtraction, division, multiplication) in forming the following expressions and tell how the expressions have been formed:

(a) $z+1, z-1, y+17, y-17$
(b) $17y, \frac{y}{17}, 5z$
(c) $2y+17, 2y-17$
(d) $7m, -7m+3, -7\text{m}-3$

Answer 3:

(a) $z+1 \rightarrow$ Addition
$z-1 \rightarrow$ Subtraction
$y+17 \rightarrow$ Addition
$y-17 \rightarrow$ Subtraction

(b) $17y \rightarrow$ Multiplication
$\frac{y}{17} \rightarrow$ Division
$5z \rightarrow$ Multiplication

(c) $2y+17 \rightarrow$ Multiplication and Addition

$2y-17 \rightarrow$ Multiplication and Subtraction

(d) $7m \rightarrow$ Multiplication

$-7m+3 \rightarrow$ Multiplication and Addition

$-7m-3 \rightarrow$ Multiplication and Subtraction

Question 4:

Give expressions for the following cases:

(a) 7 added to p. (b) 7 subtracted from p. (c) p multiplied by 7.

(d) p divided by 7. (e) 7 subtracted from $-m$. (f) $-p$ multiplied by 5.

(g) $-p$ divided by 5. (h) p multiplied by -5.

Answer 4:

(a) $p+7$ (b) $p-7$ (c) $7p$

(d) $\frac{p}{7}$ (e) $-m-7$ (f) $-5p$

(g) $\frac{-p}{5}$ (h) $-5p$

Question 5:

Give expression in the following cases:

(a) 11 added to $2m$.

(b) 11 subtracted from $2m$.

(c) 5 times y to which 3 is added.

(d) 5 times y from which 3 is subtracted.

(e) y is multiplied by -8.

(f) y is multiplied by -8 and then 5 is added to the result.

(g) y is multiplied by 5 and result is subtracted from 16.

(h) y is multiplied by -5 and the result is added to 16.

Answer 5:

(a) $2m+11$ (b) $2m-11$ (c) $5y+3$

(d) $5y-3$ (e) $-8y$ (f) $-8y+5$

(g) $16-5y$ (h) $-5y+16$

Question 6:

(a) From expressions using t and 4. Use not more than one number operation. Every expression must have t in it.

(b) Form expressions using y, 2 and 7. Every expression must have y in it. Use only two number operations. These should be different.

Answer 6:

(a) $t+4, t-4, 4-t, 4t, \frac{t}{4}, \frac{4}{t}$

(b) $2y+7, 2y-7, 7y+2, 7y-2$ and so on.

Exercise 11.4

Question 1:

Answer the following:

(a) Take Sarita's present age to be y years.

(i) What will be her age 5 years from now?

(ii) What was her age 3 years back?

(iii) Sarita's grandfather is 6 times her age. What is the age of her grandfather?

(iv) Grandmother is 2 years younger than grandfather. What is grandmother's age?

(v) Sarita's father's age is 5 years more than 3 times Sarita's age. What is her father's age?

(b) The length of a rectangular hall is 4 meters less than 3 times the breadth of the hall. What is the length, if the breadth is b meters?

(c) A rectangular box has height h cm. Its length is 5 times the height and breadth is 10 cm less than the length. Express the length and the breadth of the box in terms of the height.

(d) Meena, Beena and Leena are climbing the steps to the hill top. Meena is at step s, Beena is 8 steps ahead and Leena 7 steps behind. Where are Beena and Meena? The total number of steps to the hill top is 10 less than 4 times what Meena has reached. Express the total number of steps using s.

(e) A bus travels at v km per hour. It is going from Daspur to Beespur. After the bus has travelled 5 hours. Beespur is still 20 km away. What id the distance from Daspur to Beespur? Express it using v.

Answer 1:

(a) (i) $y+5$ (ii) $y-3$ (iii) $6y$ (iv) $6y-2$ (v) $3y+5$

(b) Length = $3b$ and Breadth = $(3b-4)$ meters

(c) Height of the box = h cm

Length of the box = 5 times the height = $5h$ cm

Breadth of the box = 10 cm less than length = $(5h-10)$ cm

(d) Meena's position = s

Beena's position = 8 steps ahead = $s+8$

Leena's position = 7 steps behind = $s-7$

Total number of steps = $4s-10$

(e) Speed of the bus = v km/h

Distance travelled in 5 hours = $5v$ km

Remaining distance = 20 km

Therefore, total distance = $(5v+20)$ km

Question 2:

Change the following statements using expressions into statements in ordinary language.

(For example, given Salim scores r runs in a cricket match, nalin scores $(r+15)$ runs. In ordinary language – Nalin scores 15 runs more than Salim).

(a) A note book costs ₹ p. A book costs ₹ $3p$.

(b) Tony puts q marbles on the table. He has $8q$ marbles in his box.

(c) Our class has n students. The school has $20n$ students.

(d) Jaggu is z years old. His uncle is $4z$ years old and his aunt is $(4z-3)$ years old.

(e) In an arrangement of dots there are r rows. Each row contains 5 dots.

Answer 2:

(a) A book cost 3 times the cost of a notebook.

(b) The number of marbles in box is 8 times the marble on the table.

(c) Total number of students in the school is 20 times that in our class.

(d) Jaggu's uncle's age is 4 times the age of Jaggu. Jaggu's aunt is 3 years younger than his uncle.

(e) The total number of dots is 5 times the number of rows.

Question 3:

(a) Given, Munnu's age to be x years. Can you guess what $(x-2)$ may show? (**Hint**: Think of Munnu's younger brother). Can you guess what $(x+4)$ may show? What $(3x+7)$ may show?

(b) Given Sara's age today to be y years. Think of her age in the future or in the past. What will the following expression indicate? $y+7, y-3, y+4\frac{1}{2}, y-2\frac{1}{2}$

(c) Given, n students in the class like football, what may $2n$ show? What may $\frac{n}{2}$ show? (**Hint**: Think of games other than football).

Answer 3:

(a) Munnu's age = x years

His younger brother is 2 years younger than him = $(x-2)$ years

His elder brother's age is 4 years more than his age = $(x+4)$ years

His father is 7 year's more than thrice of his age = $(3x+7)$ years

(b) Her age in past = $(y-3), \left(y-2\frac{1}{2}\right)$

Her age in future = $(y+7), \left(y+4\frac{1}{2}\right)$

(c) Number of students like hockey is twice the students liking football, i.e., $2n$

Number of students like tennis is half the students like football, i.e., $\frac{n}{2}$

Exercise 11.5

Question 1:

State which of the following are equations (with a variable). Given reason for your answer. Identify the variable from the equations with a variable.

(a) $17 = x + 7$ (b) $(t - 7) > 5$ (c) $\frac{4}{2} = 2$

(d) $(7 \times 3) - 19 = 8$ (e) $5 \times 4 - 8 = 2x$ (f) $x - 2 = 0$

(g) $2m < 30$ (h) $2n + 1 = 11$ (i) $7 = (11 \times 5) - (12 \times 4)$

(j) $7 = (11 \times 2) + p$ (k) $20 = 5y$ (l) $\frac{3q}{2} < 5$

(m) $z + 12 > 24$ (n) $20 - (10 - 5) = 3 \times 5$ (o) $7 - x = 5$

Answer 1:

(a) It is an equation of variable as both the sides are equal. The variable is x.

(b) It is not an equation as L.H.S. is greater than R.H.S.

(c) It is an equation with no variable. But it is a false equation.

(d) It is an equation with no variable. But it is a false equation.

(e) It is an equation of variable as both the sides are equal. The variable is x.

(f)) It is an equation of variable x.

(g) It is not an equation as L.H.S. is less than R.H.S.

(h) It is an equation of variable as both the sides are equal. The variable is n.

(i) It is an equation with no variable as its both sides are equal.

(j) It is an equation of variable p.

(k) It is an equation of variable y.

(l) It is not an equation as L.H.S. is less than R.H.S.

(m) It is not an equation as L.H.S. is greater than R.H.S.

(n) It is an equation with no variable.

(o) It is an equation of variable x.

Question 2:

Complete the entries of the third column of the table:

S. No.	Equation	Value of variable	Equation satisfied Yes/No
(a)	$10y = 80$	$y = 10$	
(b)	$10y = 80$	$y = 8$	
(c)	$10y = 80$	$y = 5$	
(d)	$4l = 20$	$l = 20$	
(e)	$4l = 20$	$l = 80$	
(f)	$4l = 20$	$l = 5$	
(g)	$b + 5 = 9$	$b = 5$	
(h)	$b + 5 = 9$	$b = 9$	
(i)	$b + 5 = 9$	$b = 4$	
(j)	$h - 8 = 5$	$h = 13$	
(k)	$h - 8 = 5$	$h = 8$	
(l)	$h - 8 = 5$	$h = 0$	
(m)	$p + 3 = 1$	$p = 3$	
(n)	$p + 3 = 1$	$p = 1$	
(o)	$p + 3 = 1$	$p = 0$	
(p)	$p + 3 = 1$	$p = -1$	
(q)	$p + 3 = 1$	$p = -2$	

Answer 2:

S. No.	Equation	Value of variable	Equ. satisfied Yes / No	Sol. of L.H.S.
(a)	$10y = 80$	$y = 10$	No	10 x 10 = 100
(b)	$10y = 80$	$y = 8$	Yes	10 x 8 = 80
(c)	$10y = 80$	$y = 5$	No	10 x 5 = 50
(d)	$4l = 20$	$l = 20$	No	4 x 20 = 80
(e)	$4l = 20$	$l = 80$	No	4 x 80 = 320
(f)	$4l = 20$	$l = 5$	Yes	4 x 5 = 20
(g)	$b + 5 = 9$	$b = 5$	No	5 + 5 = 10
(h)	$b + 5 = 9$	$b = 9$	Yes	9 + 5 = 14
(i)	$b + 5 = 9$	$b = 4$	Yes	4 + 5 = 9
(j)	$h - 8 = 5$	$h = 13$	Yes	13 – 8 = 5
(k)	$h - 8 = 5$	$h = 8$	No	8 – 8 = 0
(l)	$h - 8 = 5$	$h = 0$	No	0 – 8 = –8
(m)			No	3 + 3 = 6

(n)	$p+3=1$	$p=3$	No	1 + 3 = 4
(o)	$p+3=1$	$p=1$	No	0 + 3 = 3
(p)	$p+3=1$	$p=0$	No	–1 + 3 = 2
(q)	$p+3=1$	$p=-1$	Yes	–2 + 3 = 1
	$p+3=1$	$p=-2$		

Question 3:

Pick out the solution from the values given in the bracket next to each equation. Show that the other values do not satisfy the equation.

(a) $5m=60$ (10, 5, 12, 15)

(b) $n+12=20$ (12, 8, 20, 0)

(c) $p-5=5$ (0, 10, 5, –5)

(d) $\frac{q}{2}=7$ (7, 2, 10, 14)

(e) $r-4=0$ (4, –4, 8, 0)

(f) $x+4=2$ (–2, 0, 2, 4)

Answer 3:

(a) $5m=60$

Putting the given values in L.H.S.,

5 x 10 = 50

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $m=10$ is not the solution.

5 x 12 = 60

$\because$ L.H.S. = R.H.S.

$\therefore$ $m=12$ is a solution.

5 x 5 = 25

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $m=5$ is not the solution.

5 x 15 = 75

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $m=15$ is not the solution.

(b) $n+12=20$

Putting the given values in L.H.S.,

12 + 12 = 24

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $n=12$ is not the solution.

20 + 12 = 32

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $n=20$ is not the solution.

8 + 12 = 20

$\because$ L.H.S. = R.H.S.

$\therefore$ $n=8$ is a solution.

0 + 12 = 12

$\because$ L.H.S. $\neq$ R.H.S.

$\therefore$ $n=0$ is not the solution.

(c) $p-5=5$

Putting the given values in L.H.S.,

0 – 5 = –5

10 – 5 = 5

$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $p = 0$ is not the solution.

$5 - 5 = 0$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $p = 5$ is not the solution.

$\because$ L.H.S. $=$ R.H.S.
$\therefore$ $p = 10$ is a solution.

$-5 - 5 = -10$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $p = -5$ is not the solution.

(d) $\frac{q}{2} = 7$

Putting the given values in L.H.S.,

$\frac{7}{2}$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $q = 7$ is not the solution.

$\frac{2}{2} = 1$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $q = 2$ is not the solution.

$\frac{10}{2} = 5$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $q = 10$ is not the solution.

$\frac{14}{2} = 7$
$\because$ L.H.S. $=$ R.H.S.
$\therefore$ $q = 14$ is a solution.

(e) $r - 4 = 0$

Putting the given values in L.H.S.,

$4 - 4 = 0$
$\because$ L.H.S. $=$ R.H.S.
$\therefore$ $r = 4$ is a solution.

$8 - 4 = 4$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $r = 8$ is not the solution.

$-4 - 4 = -8$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $r = -4$ is not the solution.

$0 - 4 = -4$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $r = 0$ is not the solution.

(f) $x + 4 = 2$

Putting the given values in L.H.S.,

$-2 + 4 = 2$
$\because$ L.H.S. $=$ R.H.S.
$\therefore$ $x = -2$ is a solution.

$2 + 4 = 6$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $x = 2$ is not the solution.

$0 + 4 = 4$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $x = 0$ is not the solution.

$4 + 4 = 8$
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $x = 4$ is not the solution.

Question 4:

(a) Complete the table and by inspection of the table find the solution to the equation $m+10=16$.

m	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**----**	**----**	**----**
$m+10$	----	----	----	----	----	----	----	----	----	----	----	----	----

(b) Complete the table and by inspection of the table find the solution to the equation $5t=35$.

t	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**----**	**----**	**----**	**----**	**----**
$5t$	----	----	----	----	----	----	----	----	----	----	----	----	----	----

(c) Complete the table and by inspection of the table find the solution to the equation $\frac{z}{3}=4$.

z	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**----**	**----**	**----**	**----**
$\frac{z}{3}$	$2\frac{2}{3}$	3	$3\frac{1}{3}$	----	----	----	----	----	----	----	----	----	----

(d) Complete the table and by inspection of the table find the solution to the equation $m-7=3$.

m	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**----**	**----**
$m-7$	----	----	----	----	----	----	----	----	----	----	----

Answer 4:

(a)

m	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	11	12	13
$m+10$	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**

$\because$ At $m=6,\ m+10=16$

$\therefore$ $m=6$ is the solution.

(b)

t	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	12	13	14	15	16
$5t$	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**

$\because$ At $t=7,\ 5t=35$

$\therefore$ $t=7$ is the solution.

(c)

z	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	17	18	19	20
$\frac{z}{3}$	$2\frac{2}{3}$	3	$3\frac{1}{3}$	$3\frac{2}{3}$	4	$4\frac{1}{3}$	$4\frac{2}{3}$	5	$5\frac{1}{3}$	$5\frac{2}{3}$	6	$6\frac{1}{3}$	$6\frac{2}{3}$

$\because$ At $z=12,\ \frac{z}{3}=4$

$\therefore$ $z=12$ is the solution.

(d)

m	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	14	15
$m-7$	**–2**	**–1**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

$\because$ At $m=10,\ m-7=3$

$\therefore$ $m=10$ is the solution.

Mathematics

(Chapter – 12) (Ratio and Proportion)

(Class – VI)

Exercise 12.1

Question 1:

There are 20 girls and 15 boys in a class.

(a) What is the ratio of number of girls to the number of boys?

(b) What is the ratio of girls to the total number of students in the class?

Answer 1:

(a) The ratio of girls to that of boys = $\frac{20}{15} = \frac{4}{3}$ = 4:3

(b) The ratio of girls to total students = $\frac{20}{20+15} = \frac{20}{35} = \frac{4}{7}$ = 4:7

Question 2:

Out of 30 students in a class, like football, 12 like cricket and remaining like tennis. Find the ratio of:

(a) Number of students liking football to number of students liking tennis.

(b) Number of students liking cricket to total number of students.

Answer 2:

Total number of students = 30

Number of students like football = 6

Number of students like cricket = 12

Thus number of students like tennis = 30 – 6 – 12 = 12

(a) The ratio of students like football that of tennis = $\frac{6}{12} = \frac{1}{2}$ = 1 : 2

(b) The ratio of students like cricket to that of total students = $\frac{12}{30} = \frac{2}{5}$ = 2 : 5

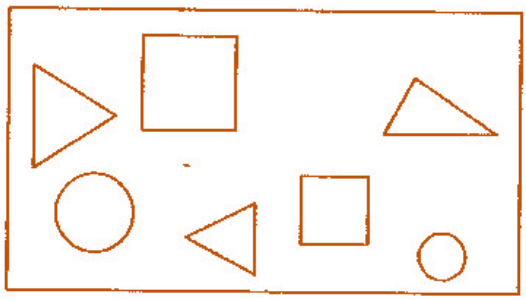
Question 3:

See the figure and find the ratio of:

(a) Number of triangles to the number of circles inside the rectangle.

(b) Number of squares to all the figures inside the rectangle.

(c) Number of circles to all the figures inside the rectangle.



Answer 3:

(a) Ratio of number of triangle to that of circles = $\frac{3}{2}$ = 3 : 2

(b) Ratio of number of squares to all figures = $\frac{2}{7}$ = 2 : 7

(c) Ratio of number of circles to all figures = $\frac{2}{7}$ = 2 : 7

Question 4:

Distances travelled by Hamid and Akhtar in an hour are 9 km and 12 km. Find the ratio of speed of Hamid to the speed of Akhtar.

Answer 4:

We know that, Speed = $\frac{\text{Distance}}{\text{Time}}$

Speed of Hamid = $\frac{9\text{ m}}{1\text{ h}}$ = 9 km/h and Speed of Akhtar = $\frac{12\text{ m}}{1\text{ h}}$ = 12 km/h

Ratio of speed of Hamid to that of speed of Akhtar = $\frac{9}{12} = \frac{3}{4}$ = 3 : 4

Question 5:

Fill in the following blanks:

$\frac{15}{18} = \frac{\square}{6} = \frac{10}{\square} = \frac{\square}{30}$

[Are these equivalent ratios?]

Answer 5:

$\frac{15}{18} = \frac{\boxed{5}}{6} = \frac{10}{\boxed{12}} = \frac{\boxed{25}}{30}$

Yes, these are equivalent ratios.

Question 6:

Find the ratio of the following:

(a) 81 to 108 (b) 98 to 63

(c) 33 km to 121 km (d) 30 minutes to 45 minutes

Answer 6:

(a) Ratio of 81 to 108 = $\frac{\cancel{81}}{\cancel{108}} = \frac{3}{4}$ = 3 : 4

(b) Ratio of 98 to 63 = $\frac{\cancel{98}}{\cancel{63}} = \frac{14}{9}$ = 14 : 9

(c) Ratio of 33 km to 121 km = $\frac{\cancel{33}}{\cancel{121}} = \frac{3}{11}$ = 3 : 11

(d) Ratio of 30 minutes to 45 minutes = $\frac{\cancel{30}}{\cancel{45}} = \frac{2}{3}$ = 2 : 3

Question 7:

Find the ratio of the following:

(a) 30 minutes to 1 hour (b) 40 cm to 1.5 m

(c) 55 paise to ₹ 1 (d) 500 m*l* to 2 litres

Answer 7:

(a) 30 minutes to 1.5 hour

1.5 hours = 1.5 x 60 = 90 minutes [∵ 1 hour = 60 minutes]

Now, ratio of 30 minutes to 1.5 hour = 30 minutes : 1.5 hour

$\Rightarrow$ 30 minutes : 90 minutes = $\frac{\cancel{30}}{\cancel{90}} = \frac{1}{3}$ = 1 : 3

(b) 40 cm to 1.5 m

1.5 m = 1.5 x 100 cm = 150 cm [∵ 1 m = 100 cm]

Now, ratio of 40 cm to 1.5 m = 40 cm : 1.5 m

$\Rightarrow$ 40 cm : 150 cm = $\frac{\cancel{40}}{\cancel{150}} = \frac{4}{15}$ = 4 : 15

(c) 55 paise to Re. 1

₹ 1 = 100 paise

Now, ratio of 55 paise to ₹1 = 55 paise : 100 paise

$\Rightarrow$ $\frac{\cancel{55}}{\cancel{100}} = \frac{11}{20}$ = 11 : 20

(d) 500 ml to 2 litters

2 litres = 2 x 1000 ml = 2000 ml [$\because$ 1 litre = 1000 ml]

Now, ratio of 500 ml to 2 litres = 500 ml : 2 litres

$\Rightarrow$ 500 ml : 2000 ml = $\frac{\cancel{500}}{\cancel{2000}} = \frac{1}{4}$ = 1 : 4

Question 8:

In a year, Seema earns ₹1,50,000 and saves ₹50,000. Find the ratio of:

(a) Money that Seema earns to the money she saves.

(b) Money that she saves to the money she spends.

Answer 8:

Total earning = ₹1,50,000 and Saving = ₹50,000

$\therefore$ Money spent = ₹1,50,000 - ₹50,000 = ₹1,00,000

(a) Ratio of money earned to money saved = $\frac{\cancel{150000}}{\cancel{50000}} = \frac{3}{1}$ = 3 : 1

(b) Ratio of money saved to money spend = $\frac{\cancel{50000}}{\cancel{100000}} = \frac{1}{2}$ = 1 : 2

Question 9:

There are 102 teachers in a school of 3300 students. Find the ratio of the number of teachers to the number of students.

Answer 9:

Ratio of number of teachers to that of students = $\frac{\cancel{102}}{\cancel{3300}} = \frac{17}{550}$ = 17 : 550

Question 10:

In a college out of 4320 students, 2300 are girls. Find the ratio of:

(a) Number of girls to the total number of students.

(b) Number of boys to the number of girls.

(c) Number of boys to the total number of students.

Answer 10:

Total number of students in school = 4320

Number of girls = 2300

Therefore, number of boys = 4320 – 2300 = 2020

(a) Ratio of girls to total number of students = $\frac{2300}{4320} = \frac{115}{216}$ = 115 : 216

(b) Ratio of boys to that of girls = $\frac{2020}{2300} = \frac{101}{115}$ = 101 : 115

(c) Ratio of boys to total number of students = $\frac{2020}{4320} = \frac{101}{216}$ = 101 : 216

Question 11:

Out of 1800 students in a school, 750 opted basketball, 800 opted cricket and remaining opted table tennis. If a student can opt only one game, find the ratio of:

(a) Number of students who opted basketball to the number of students who opted table tennis.

(b) Number of students who opted cricket to the number of students opting basketball.

(c) Number of students who opted basketball to the total number of students.

Answer 11:

Total number of students = 1800

Number of students opted basketball = 750

Number of students opted cricket = 800

Therefore, number of students opted tennis = 1800 – (750 + 800) = 250

(a) Ratio of students opted basketball to that of opted table tennis = $\frac{750}{250} = \frac{3}{1}$ =3:1

(b) Ratio of students opted cricket to students opted basketball = $\frac{800}{750} = \frac{16}{15}$ =16:15

(c) Ratio of students opted basketball to total no. of students = $\frac{750}{1800} = \frac{5}{12}$ = 5:12

Question 12:

Cost of a dozen pens is ₹180 and cost of 8 ball pens is ₹56. Find the ratio of the cost of a pen to the cost of a ball pen.

Answer 12:

Cost of a dozen pens (12 pens) = ₹180

$\therefore$ Cost of 1 pen = $\frac{180}{12}$ = ₹15

Cost of 8 ball pens = ₹56

$\therefore$ Cost of 1 ball pen = $\frac{56}{8}$ = ₹7

Ratio of cost of one pen to that of one ball pen = $\frac{15}{7}$ = 15 : 7

Question 13:

Consider the statement: Ratio of breadth and length of a ball is 2 : 5. Complete the following table that shows some possible breadths and lengths of the hall.

Breadth of the hall (in meters)	10	☐	40
Length of the hall (in meters)	25	50	☐

Answer 13:

Ratio of breadth to length = 2 : 5 = $\frac{2}{5}$

$\therefore$ Other equivalent ratios are = $\frac{2}{5}\times\frac{10}{10}=\frac{20}{50}$, $\frac{2}{5}\times\frac{20}{20}=\frac{40}{100}$

Thus,

Breadth of the hall (in meters)	10	20	40
Length of the hall (in meters)	25	50	100

Question 14:

Divide 20 pens between Sheela and Sangeeta in the ratio 3 : 2.

Answer 14:

Ratio between Sheela and Sangeeta = 3 : 2

Total these terms = 3 + 2 = 5

Therefore, the part of Sheela = $\frac{3}{5}$ of the total pens

and the part of Sangeeta = $\frac{2}{5}$ of total pens

Thus, Sheela gets = $\frac{3}{\cancel{5}} \times \cancel{20}$ = 12 pens

and Sangeeta gets = $\frac{2}{\cancel{5}} \times \cancel{20}$ = 8 pens

Question 15:

Mother wants to divide ₹36 between her daughters Shreya and Bhoomika in the ratio of their ages. If the age of Shreya is 15 years and age of Bhoomika is 12 years, find how much Shreya and Bhoomika will get.

Answer 15:

Ratio of the age of Shreya to that of Bhoomika = $\frac{\cancel{15}}{\cancel{12}} = \frac{5}{4}$ = 5 : 4

Thus, ₹36 divide between Shreya and Bhoomika in the ratio of 5 : 4.

Shreya gets = $\frac{5}{9}$ of ₹36 = $\frac{5}{\cancel{9}} \times \cancel{36}$ = ₹20

Bhoomika gets = $\frac{4}{9}$ of ₹36 = $\frac{4}{\cancel{9}} \times \cancel{36}$ = ₹16

Question 16:

Present age of father is 42 years and that of his son is 14 years. Find the ratio of:

(a) Present age of father to the present age of son.

(b) Age of the father to the age of the son, when son was 12 years old.

(c) Age of father after 10 years to the age of son after 10 years.

(d) Age of father to the age of son when father was 30 years old.

Answer 16:

(a) Ratio of father's present age to that of son = $\frac{\cancel{42}}{\cancel{14}} = \frac{3}{1}$ = 3 : 1

(b) When son was 12 years, i.e., 2 years ago, then father was (42 – 2) = 40 years

Therefore, the ratio of their ages = $\frac{\cancel{40}}{\cancel{12}} = \frac{10}{3}$ = 10 : 3

(c) Age of father after 10 years = 42 + 10 = 52 years

Age of son after 10 years = 14 + 10 = 24 years

Therefore, ratio of their ages = $\frac{\cancel{52}}{\cancel{24}} = \frac{13}{6}$ = 13 : 6

(d) When father was 30 years old,

i.e., 12 years ago, then son was (14 – 12) = 2 years old

Therefore, the ratio of their ages = $\frac{\cancel{30}}{\cancel{2}} = \frac{15}{1}$ = 15 : 1

Exercise 12.2

Question 1:

Determine the following are in proportion:

(a) 15, 45, 40, 120

(b) 33, 121, 9, 96

(c) 24, 28, 36, 48

(d) 32, 48, 70, 210

(e) 4, 6, 8, 12

(f) 33, 44, 75, 100

Answer 1:

(a) $15 : 45 = \frac{\cancel{15}}{\cancel{45}} = \frac{1}{3} = 1 : 3$

$40 : 120 = \frac{\cancel{40}}{\cancel{120}} = \frac{1}{3} = 1 : 3$

Since $15 : 45 = 40 : 120$

Therefore, 15, 45, 40, 120 are in proportion.

(b) $33 : 121 = \frac{\cancel{33}}{\cancel{121}} = \frac{3}{11} = 3 : 11$

$9 : 96 = \frac{\cancel{9}}{\cancel{96}} = \frac{3}{32} = 3 : 32$

Since $33 : 121 \neq 9 : 96$

Therefore, 33, 121, 9, 96 are not in proportion.

(c) $24 : 28 = \frac{\cancel{24}}{\cancel{28}} = \frac{6}{7} = 6 : 7$

$36 : 48 = \frac{\cancel{36}}{\cancel{48}} = \frac{3}{4} = 3 : 4$

Since $24 : 28 \neq 36 : 48$

Therefore, 24, 28, 36, 48 are not in proportion.

(d) $32 : 48 = \frac{\cancel{32}}{\cancel{48}} = \frac{2}{3} = 2 : 3$

$70 : 210 = \frac{\cancel{70}}{\cancel{210}} = \frac{1}{3} = 1 : 3$

Since $32 : 48 \neq 70 : 210$

Therefore, 32, 48, 70, 210 are not in proportion.

(e) $4 : 6 = \frac{\cancel{4}}{\cancel{6}} = \frac{2}{3} = 2 : 3$

$8 : 12 = \frac{\cancel{8}}{\cancel{12}} = \frac{2}{3} = 2 : 3$

Since $4 : 6 = 8 : 12$

Therefore, 4, 6, 8, 12 are in proportion.

(f) $33 : 44 = \frac{\cancel{33}}{\cancel{44}} = \frac{3}{4} = 3 : 4$

$75 : 100 = \frac{\cancel{75}}{\cancel{100}} = \frac{3}{4} = 3 : 4$

Since $33 : 44 = 75 : 100$

Therefore, 33, 44, 75, 100 are in ratio.

Question 2:

Write True (T) or False (F) against each of the following statements:

(a) 16 : 24 : : 20 : 30

(b) 21 : 6 : : 35 : 10

(c) 12 : 18 : : 28 : 12

(d) 8 : 9 : : 24 : 27

(e) 5.2 : 3.9 : : 3 : 4

(f) 0.9 : 0.36 : : 10 : 4

Answer 2:

(a) 16 : 25 : : 20 : 30

$\Rightarrow \quad \frac{\cancel{16}}{\cancel{24}} = \frac{\cancel{20}}{\cancel{30}}$

$\Rightarrow \quad \frac{2}{3} = \frac{2}{3}$

Hence, it is True.

(b) 21 : 6 : : 35 : 10

$\Rightarrow \quad \frac{\cancel{21}}{\cancel{6}} = \frac{\cancel{35}}{\cancel{10}}$

$\Rightarrow \quad \frac{7}{2} = \frac{7}{2}$

Hence, it is True.

(c) 12 : 18 : : 28 : 12

$$\Rightarrow \quad \frac{\cancel{12}}{\cancel{18}} = \frac{\cancel{28}}{\cancel{12}}$$

$$\Rightarrow \quad \frac{2}{3} \neq \frac{7}{3}$$

Hence, it is False.

(d) 8 : 9 : : 24 : 27

$$\Rightarrow \quad \frac{\cancel{8}}{\cancel{9}} = \frac{\cancel{24}}{\cancel{27}}$$

$$\Rightarrow \quad \frac{8}{9} = \frac{8}{9}$$

Hence, it is True.

(e) 5.2 : 3.9 : : 3 : 4

$$\Rightarrow \quad \frac{\cancel{5.2}}{\cancel{3.9}} = \frac{\cancel{3}}{\cancel{4}}$$

$$\Rightarrow \quad \frac{4}{3} \neq \frac{3}{4}$$

Hence, it is False.

(f) 0.9 : 0.36 : : 10 : 4

$$\Rightarrow \quad \frac{\cancel{0.9}}{\cancel{0.36}} = \frac{\cancel{10}}{\cancel{4}}$$

$$\Rightarrow \quad \frac{5}{2} = \frac{5}{2}$$

Hence, it is True.

Question 3:

Are the following statements true:

(a) 40 persons : 200 persons = ₹15 : ₹75
(b) 7.5 litres : 15 litres = 5 kg : 10 kg
(c) 99 kg : 45 kg = ₹44 : ₹20
(d) 32 m : 64 m = 6 sec. : 12 sec.
(e) 45 km : 60 km = 12 hours : 15 hours

Answer 3:

(a) 40 persons : 200 persons = $\frac{\cancel{40}}{\cancel{200}} = \frac{1}{5}$ = 1 : 5

₹15 : ₹75 = $\frac{\cancel{15}}{\cancel{75}} = \frac{1}{5}$ = 1 : 5

Since, 40 persons : 200 persons = ₹15 : ₹75

Hence, the statement is true.

(b) 7.5 litres : 15 litres = $\frac{7.5}{15} = \frac{\cancel{75}}{\cancel{150}} = \frac{1}{2}$ = 1 : 2

5 kg : 10 kg = $\frac{\cancel{5}}{\cancel{10}} = \frac{1}{2}$ = 1 : 2

Since, 7.5 litres : 15 litres = 5 kg : 10 kg

Hence, the statement is true.

(c) 99 kg : 45 kg = $\frac{\cancel{99}}{\cancel{45}} = \frac{11}{5}$ = 11 : 5

₹44 : ₹20 = $\frac{\cancel{44}}{\cancel{20}} = \frac{11}{5}$ = 11 : 5

Since, 99 kg : 45 kg = ₹44 : ₹20

Hence, the statement is true.

(d) 32 m : 64 m = $\frac{\cancel{32}}{\cancel{64}} = \frac{1}{2}$ = 1 : 2

6 sec : 12 sec = $\frac{\cancel{6}}{\cancel{12}} = \frac{1}{2}$ = 1 : 2

Since, 32 m : 64 m = 6 sec : 12 sec

Hence, the statement is true.

(e) 45 km : 60 km = $\frac{\cancel{45}}{\cancel{60}} = \frac{3}{4}$ = 3 : 4

12 hours : 15 hours = $\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$ = 4 : 5

Since, 45 km : 60 km $\neq$ 12 hours : 15 hours

Hence, the statement is not true.

Question 4:

Determine if the following ratios form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion:

(a) 25 cm : 1 m and ₹40 : ₹160
(b) 39 litres : 65 litres and 6 bottles : 10 bottles
(c) 2 kg : 80 kg and 25 g : 625 g
(d) 200 ml : 2.5 ml and ₹4 : ₹50

Answer 4:

(a) 25 cm : 1 m = 25 cm : (1 x 100) cm = 25 cm : 100 cm = $\frac{\cancel{25}}{\cancel{100}} = \frac{1}{4}$ = 1 : 4

₹40 : ₹160 = $\frac{\cancel{40}}{\cancel{160}} = \frac{1}{4}$ = 1 : 4

Since the ratios are equal, therefore these are in proportion.
Middle terms = 1 m, ₹40 and Extreme terms = 25 cm, ₹160

(b) 39 litres : 65 litres = $\frac{\cancel{39}}{\cancel{65}} = \frac{3}{5}$

6 bottles : 10 bottles = $\frac{\cancel{6}}{\cancel{10}} = \frac{3}{5}$ = 3 : 5

Since the ratios are equal, therefore these are in proportion.
Middle terms = 65 litres, 6 bottles and Extreme terms = 39 litres, 10 bottles

(c) 2 kg : 80 kg = $\frac{\cancel{2}}{\cancel{80}} = \frac{1}{40}$ = 1 : 40

25 g : 625 g = $\frac{\cancel{25}}{\cancel{625}} = \frac{1}{25}$ = 1 : 25

Since the ratios are not equal, therefore these are not in proportion.

(d) 200 ml :2.5 litres = 200 ml:(25000) litres = 200 ml : 2500 ml = $\frac{\cancel{200}}{\cancel{2500}} = \frac{2}{25}$ = 2:25

₹4 : ₹50 = $\frac{\cancel{4}}{\cancel{50}} = \frac{2}{25}$ = 2 : 25

Since the ratios are equal, therefore these are in proportion.
Middle terms = 2.5 litres, ₹4 and Extreme terms = 200 ml, ₹50

Exercise 12.3

Question 1:

If the cost of 7 m of cloth is ₹294, find the cost of 5 m of cloth.

Answer 1:

Cost of 7 m of cloth = ₹294

$\therefore$ Cost of 1 m of cloth = $\frac{294}{7}$ = ₹42

$\therefore$ Cost of 5 m of cloth = 42 x 5 = ₹210

Thus, the cost of 5 m of cloth is ₹210.

Question 2:

Ekta earns ₹1500 in 10 days. How much will she earn in 30 days?

Answer 2:

Earning of 10 days = ₹1500

$\therefore$ Earning of 1 day = $\frac{1500}{10}$ = ₹150

$\therefore$ Earning of 30 days = 150 x 30 = ₹4500

Thus, the earning of 30 days is ₹4,500.

Question 3:

If it has rained 276 mm in the last 3 days, how many cm of rain will fall in one full week (7 days)? Assume that the rain continues to fall at the same rate.

Answer 3:

Rain in 3 days = 276 mm

$\therefore$ Rain in 1 day = $\frac{276}{3}$ = 92 mm

$\therefore$ Rain in 7 days = 92 x 7 = 644 mm

Thus, the rain in 7 days is 644 mm.

Question 4:

Cost of 5 kg of wheat is ₹30.50.

(a) What will be the cost of 8 kg of wheat?

(b) What quantity of wheat can be purchased in ₹61?

Answer 4:

(a) Cost of 5 kg of wheat = ₹30.50

$\therefore$ Cost of 1 kg of wheat = $\frac{30.50}{5} = \frac{\cancel{3050}}{\cancel{500}}$ = ₹6.10

$\therefore$ Cost of 8 kg of wheat = 6.10 x 8 = ₹48.80

(b) From ₹30.50, quantity of wheat can be purchased = 5 kg

$\therefore$ From ₹1, quantity of wheat can be purchased = $\frac{5}{30.50}$

$\therefore$ From ₹61, quantity of wheat can be purchased = $\frac{5}{30.50} \times 61 = \frac{5}{\cancel{3050}} \times \cancel{6100}$

= 10 kg

Question 5:

The temperature dropped 15 degree Celsius in the last 30 days. If the rate of temperature drop remains the same, how many degrees will the temperature drop in the next ten days?

Answer 5:

Degree of temperature dropped in last 30 days = 15 degrees

$\therefore$ Degree of temperature dropped in last 30 days = $\frac{\cancel{15}}{\cancel{30}} = \frac{1}{2}$ degree

$\therefore$ Degree of temperature dropped in last 10 days = $\frac{1}{\cancel{2}} \times \cancel{10}$ = 5 degree

Thus, 5 degree Celsius temperature dropped in 10 days.

Question 6:

Shaina pays ₹7500 as rent for 3 months. How much does she has to pay for a whole year, if the rent per month remains same?

Answer 6:

Rent paid for 3 months = ₹7500

$\therefore$ Rent paid for 1 months = $\frac{7500}{3}$ = ₹2500

$\therefore$ Rent paid for 12 months = 2500 x 12 = ₹30,000

Thus, the total rent of one year is ₹30,000.

Question 7:

Cost of 4 dozens bananas is ₹60. How many bananas can be purchased for ₹12.50?

Answer 7:

Cost of 4 dozen bananas = ₹60

Cost of 48 bananas = ₹60 [4 dozen = 4 x 12 = 48]

$\because$ From ₹60, number of bananas can be purchased = 48

$\therefore$ From ₹1, number of bananas can be purchased = $\frac{48}{60} = \frac{4}{5}$

$\therefore$ From ₹12.50, number of bananas can be purchased = $\frac{4}{5} \times 12.50 = \frac{4}{5} \times \frac{1250}{100} = \frac{250}{25}$

= 10 bananas

Thus, 10 bananas can be purchased for ₹12.50.

Question 8:

The weight of 72 books is 9 kg what is the weight of 40 such books?

Answer 8:

The weight of 72 books = 9 kg

$\therefore$ The weight of 1 book = $\frac{9}{72} = \frac{1}{8}$

$\therefore$ The weight of 40 books = $\frac{1}{8} \times 40$ = 5 kg

Thus, the weight of 40 books is 5 kg.

Question 9:

A truck requires 108 litres of diesel for covering a distance of 594 km. How much diesel will be required by the truck to cover a distance of 1650 km?

Answer 9:

For covering 594 km, a truck will be required diesel = 108 litres

$\therefore$ For covering 1 km, a truck will be required diesel = $\frac{\cancel{108}}{\cancel{594}} = \frac{2}{11}$

$\therefore$ For covering 1650 km, a truck will be required diesel = $\frac{2}{\cancel{11}} \times \cancel{1650}$ = 300 litres

Thus, 300 litres diesel required by the truck to cover a distance of 1650 km.

Question 10:

Raju purchases 10 pens for ₹150 and Manish buys 7 pens for ₹84. Can you say who got the pen cheaper?

Answer 10:

Raju purchase 10 pens for = ₹150

$\therefore$ Raju purchases 1 pen for = $\frac{\cancel{150}}{\cancel{10}}$ = ₹15

Manish purchases 7 pens for = ₹84

$\therefore$ Manish purchases 1 pen for = $\frac{\cancel{84}}{\cancel{7}}$ = ₹12

Thus, Manish got the pens cheaper.

Question 11:

Anish made 42 runs in 6 overs and Anup made 63 runs in 7 overs. Who made more runs per over?

Answer 11:

Anish made in 6 overs = 42 runs

$\therefore$ Anish made in 1 overs = $\frac{\cancel{42}}{\cancel{6}}$ = 7 runs

Anup made in 7 overs = 63 runs

$\therefore$ Anup made in 1 overs = $\frac{\cancel{63}}{\cancel{7}}$ = 9 runs

Thus, Anup made more runs per over.

Mathematics

(Chapter – 13) (Symmetry)

(Class – VI)

Exercise 13.1

Question 1:

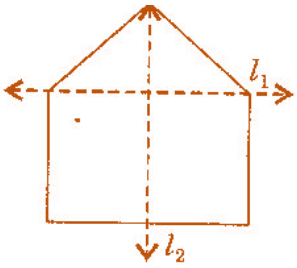
List any four symmetrical from your home or school.

Answer 1:

Notebook, Blackboard, Glass, Inkpot.

Question 2:

For the given figure, which one is the mirror line, l_1 or l_2 ?

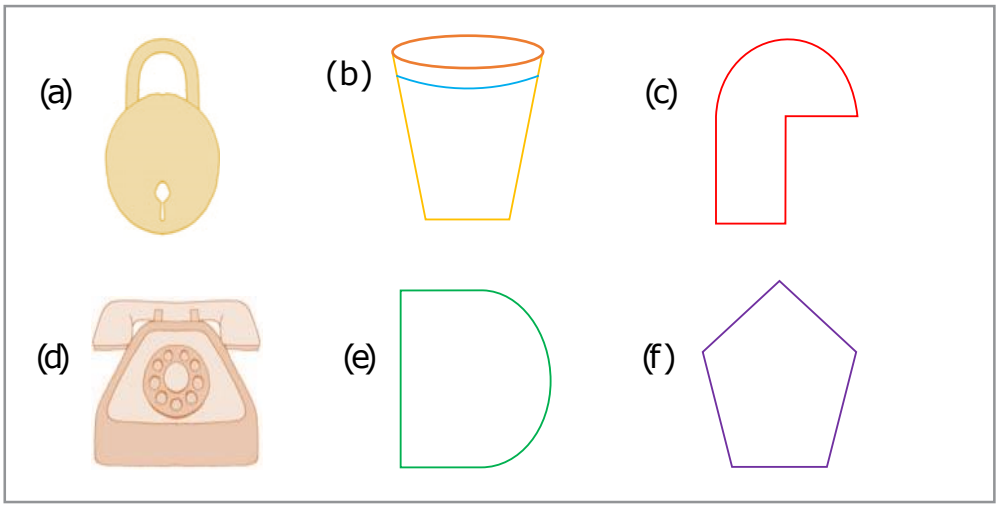


Answer 2:

l_2 is the mirror line as both sides of the lines are symmetric.

Question 3:

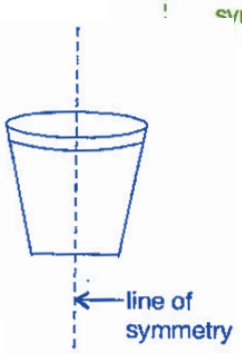
Identify the shapes given below. Check whether they are symmetric or not. Draw the line of symmetry as well.



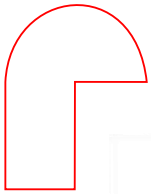
Answer 3:

(a) Symmetric

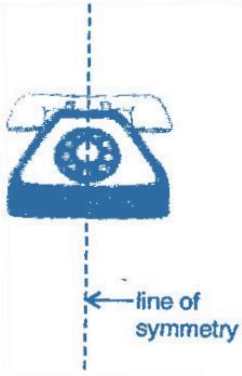
(b) Symmetric



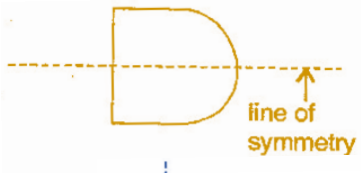
(c) Not symmetric



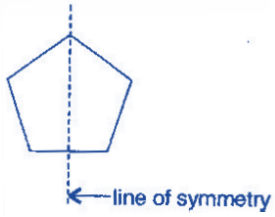
(d) Symmetric



(e) Symmetric

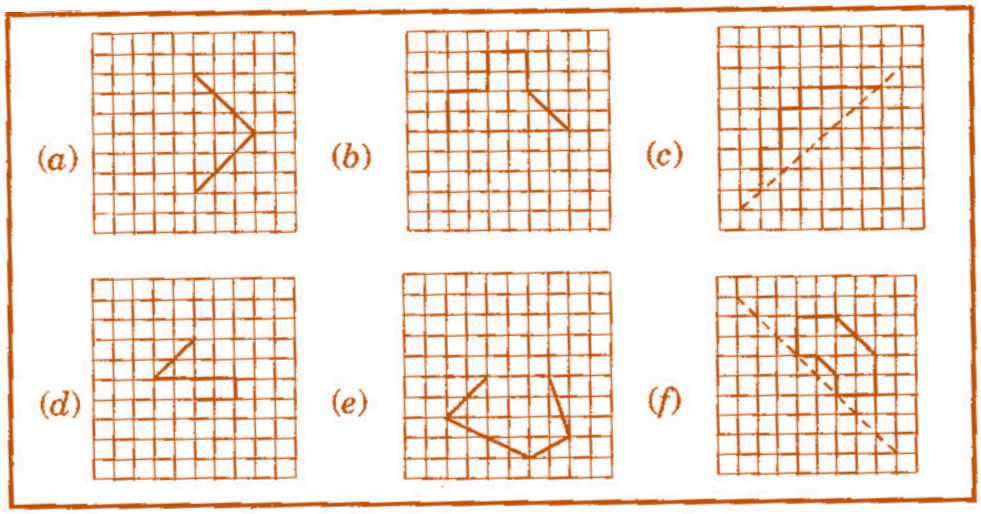


(f) Symmetric

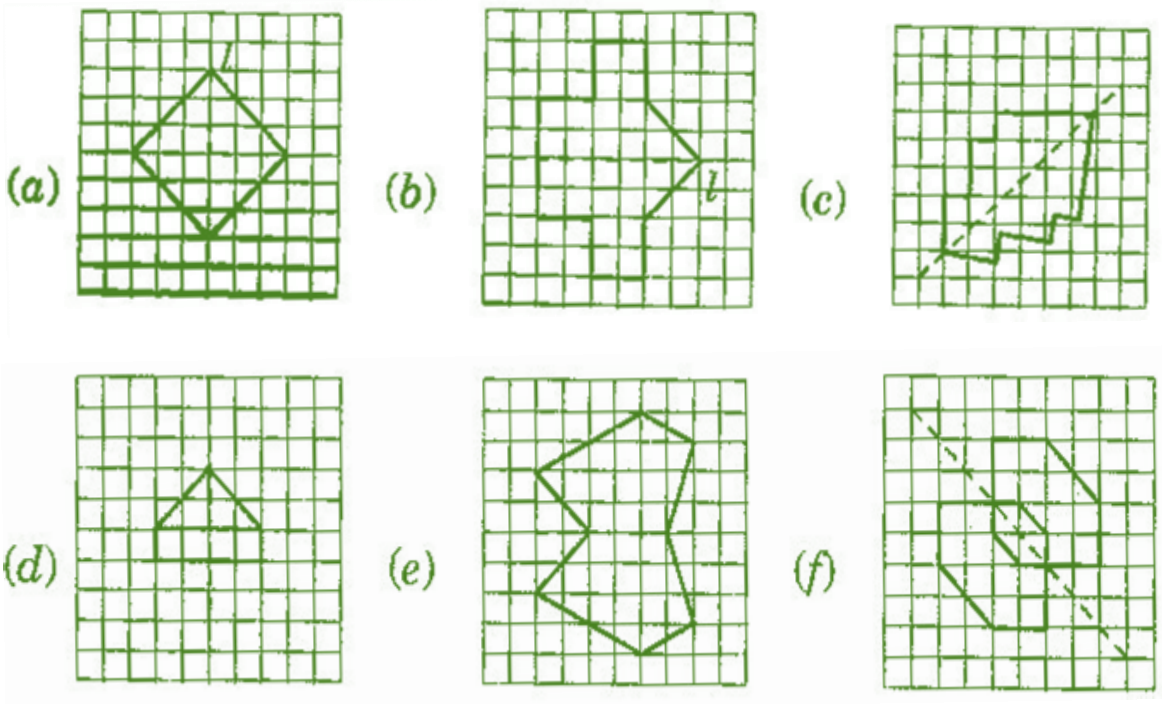


Question 4:

Copy the following on a square paper. A square paper is what you would have used in your arithmetic notebook in earlier classes. Then complete them such that the dotted line is the line of symmetry.

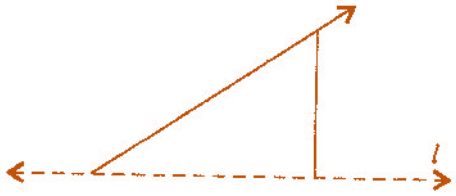


Answer 4:

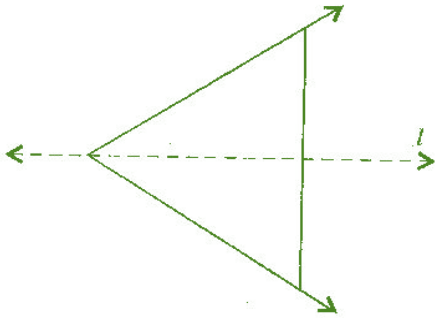


Question 5:

In the figure, l is the line of symmetry. Complete the diagram to make it symmetric.

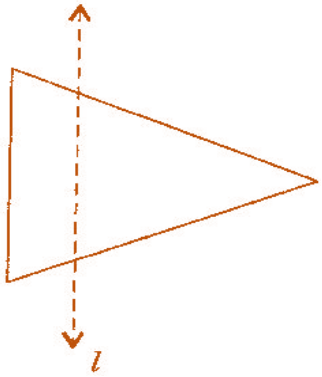


Answer 5:

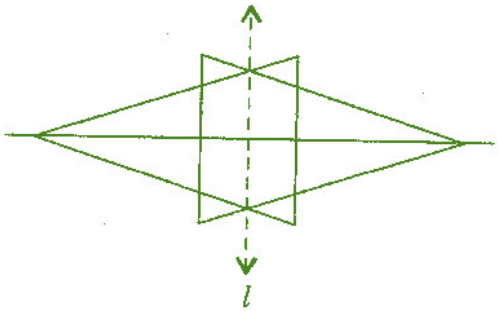


Question 6:

In the figure, l is the line of symmetry. Draw the image of the triangle and complete the diagram, so that it becomes symmetric.



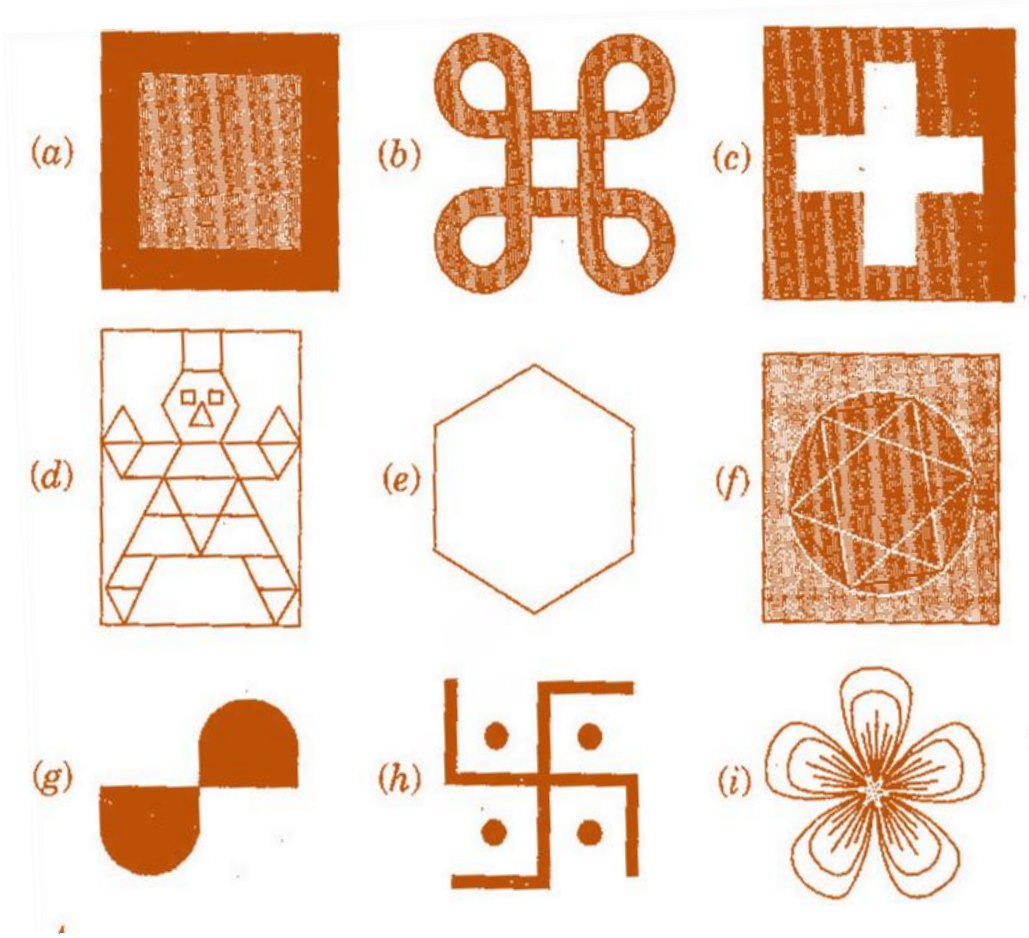
Answer 6:



Exercise 13.2

Question 1:

Find the number of lines of symmetry for each of the following shapes:

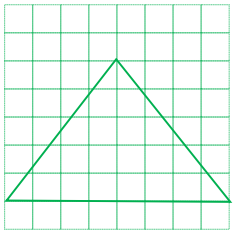


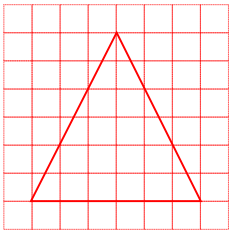
Answer 1:

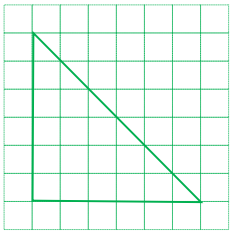
(a) 4
(b) 4
(c) 4
(d) 1
(e) 6
(f) 4
(g) 0
(h) 0
(i) 3

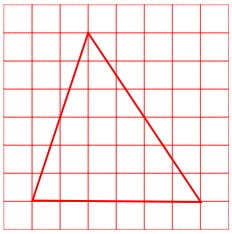
Question 2:

Copy the triangle in each of the following figures on squared paper. In each case, draw the line(s) of symmetry, if any and identify the type of triangle. (Some of you may like to trace the figures and try paper-folding first!)

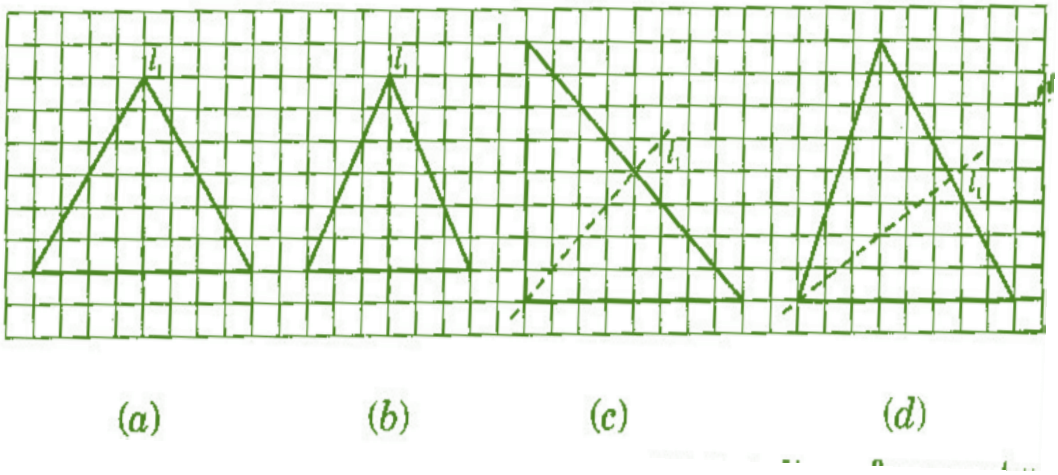
(a) 

(b) 

(c) 

(d) 

Answer 2:



(a) l_1 is the line of symmetry.

(b) l_1 is the line of symmetry.

(c) l_1 is the line of symmetry.

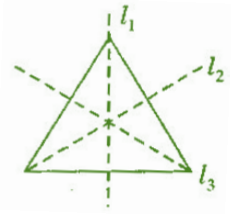
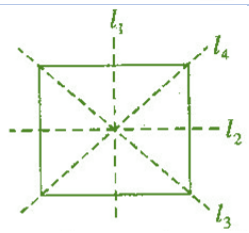
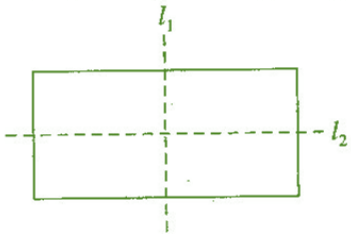
(d) No line of symmetry.

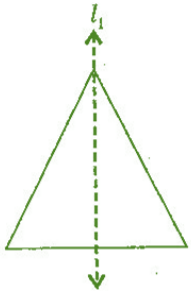
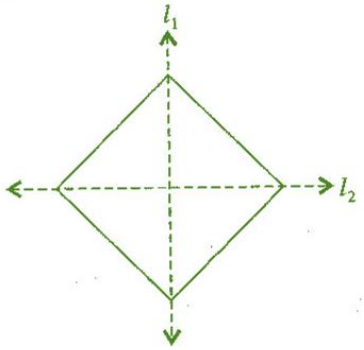
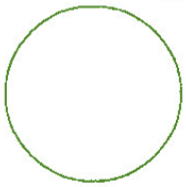
Question 3:

Complete the following table:

Shape	Rough figure	No. of lines of symmetry
Equilateral triangle		3
Square		
Rectangle		
Isosceles triangle		
Rhombus		
Circle		

Answer 3:

Shape	Rough figure	No. of lines of symmetry
Equilateral triangle		3
Square		4
Rectangle		2

Isosceles triangle		1
Rhombus		2
Circle		Infinite

Question 4:

Can you draw a triangle which has:

(a) exactly one line of symmetry?

(b) exactly two lines of symmetry?

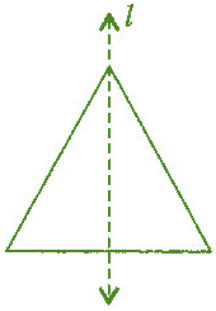
(c) exactly three lines of symmetry?

(d) no lines of symmetry?

Sketch a rough figure in each case.

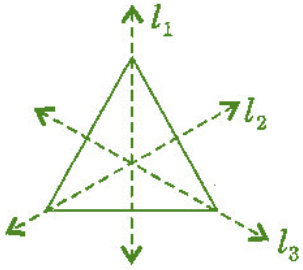
Answer 4:

(a) Yes, Isosceles triangle



(b) No such triangle cannot be formed.

(c) Yes, Equilateral triangle



(d) Yes, Scalene triangle

Question 5:

On a squared paper, sketch the following:

(a) A triangle with a horizontal line of symmetry but no vertical line of symmetry.

(b) A quadrilateral with both horizontal and vertical lines of symmetry.

(c) A quadrilateral with a horizontal line of symmetry but no vertical line of symmetry.

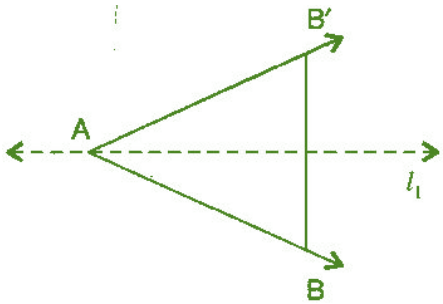
(d) A hexagon with exactly with two lines of symmetry.

(e) A hexagon with six lines of symmetry.

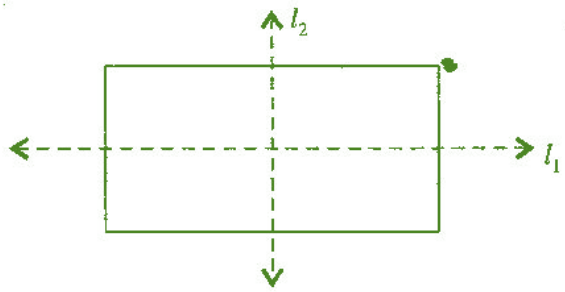
(**Hin**t: It will be helpful if you first draw the lines of symmetry and then complete the figures)

Answer 5:

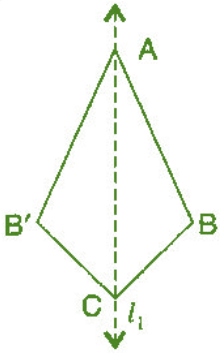
(a)



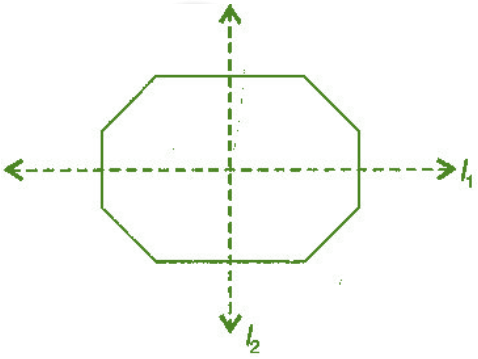
(b)



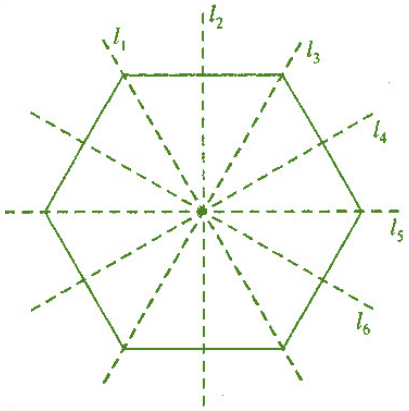
(c)



(d)

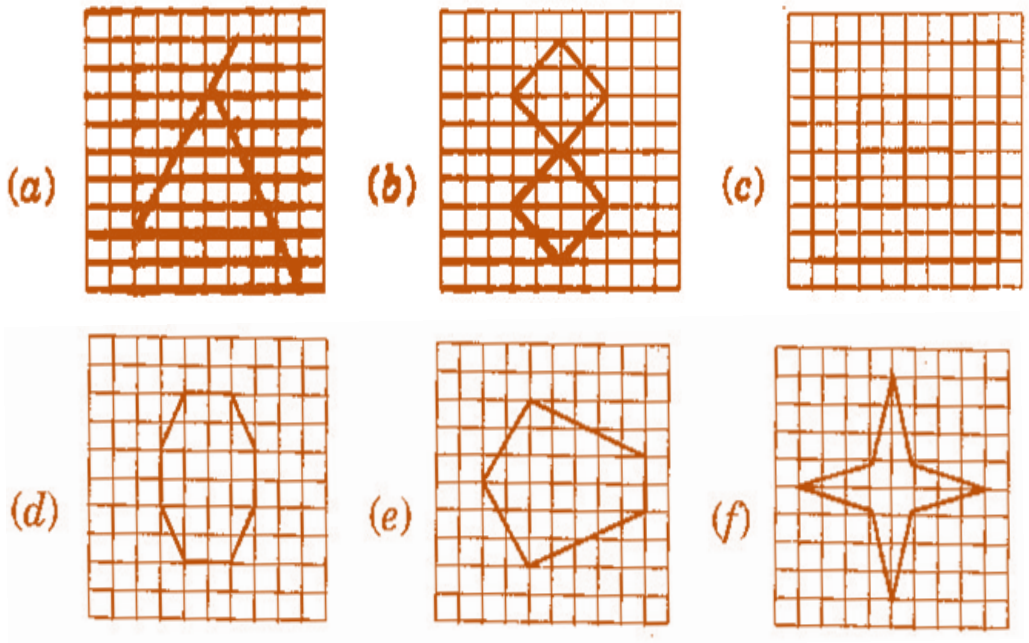


(e)



Question 6:

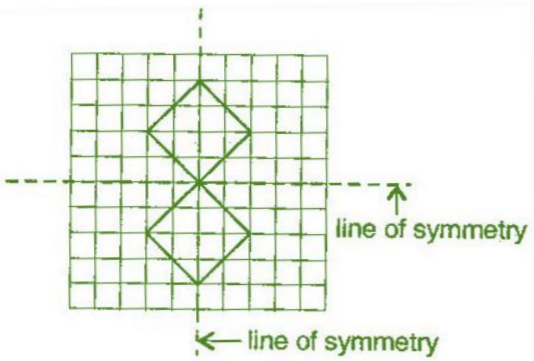
Trace each figure and draw the lines of symmetry, if any:



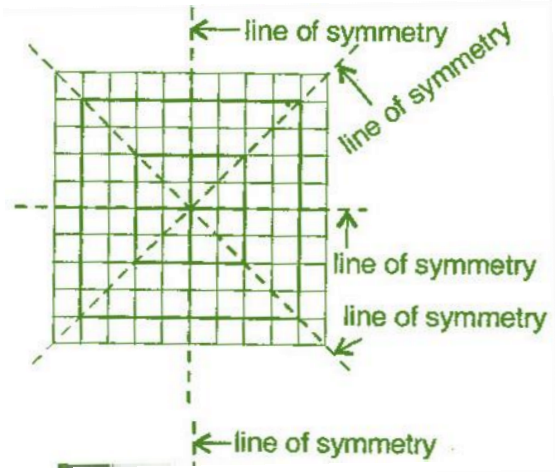
Answer 6:

(a) No line

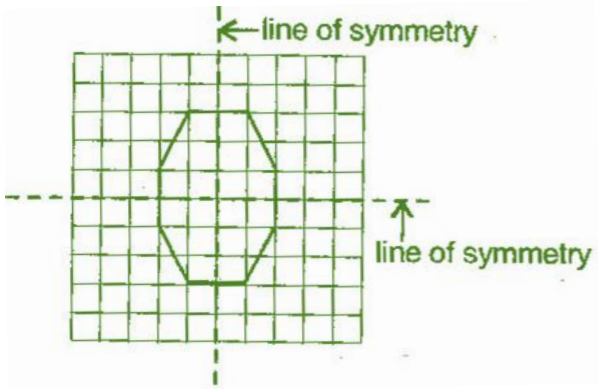
(b) Two lines



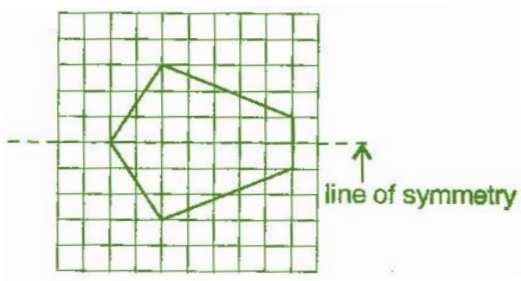
(c) Four lines



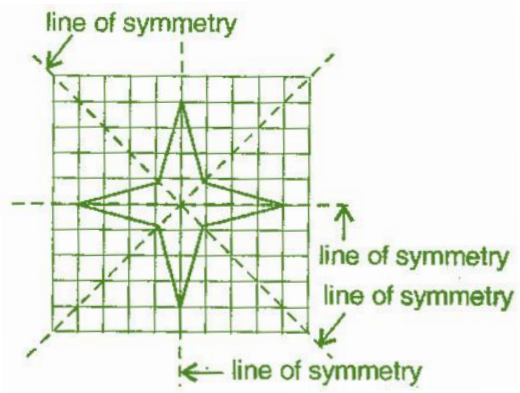
(d) Two lines



(e) One line

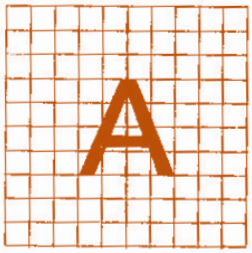


(f) Four lines



Question 7:

Consider the letters of English alphabets A to Z. List among them the letters which have:



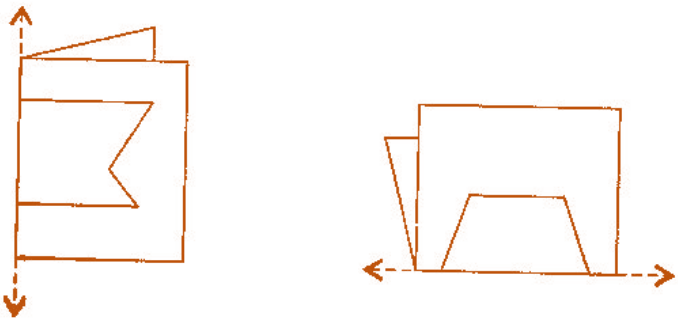
(a) vertical lines of symmetry (like A)
(b) horizontal lines of symmetry (like B)
(c) no lines of symmetry (like Q)

Answer 7:

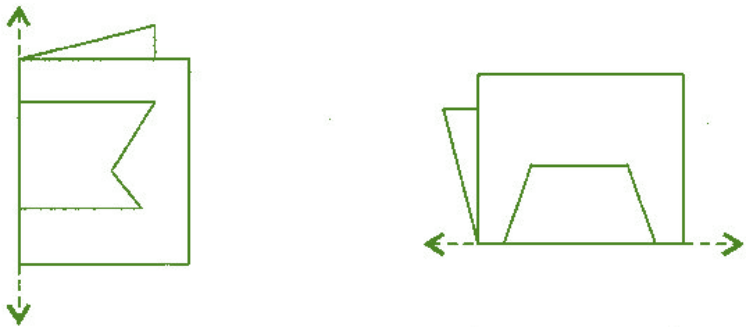
Vertical lines:	A, H, I, M, O, T, U, V, W, X, Y
Horizontal lines:	B, C, D, E, H, I, K, O, X
No line of symmetry:	F, G, J, N, P, Q, R, S, Z

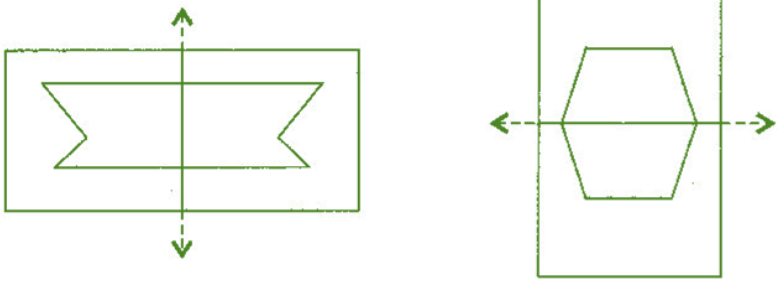
Question 8:

Given here are figures of a few folded sheets and designs drawn about the fold. In each case, draw a rough diagram of the complete figure that would be seen when the design is cut off.



Answer 8:

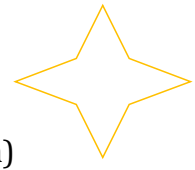




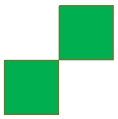
Exercise 13.3

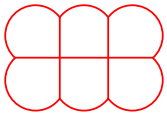
Question 1:

Find the number of lines of symmetry in each of the following shapes. How will you check your answer?

(a) 

(b) 

(c) 

(d) 

(e) 

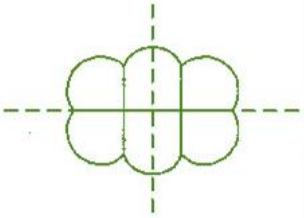
(f) 

Answer 1:

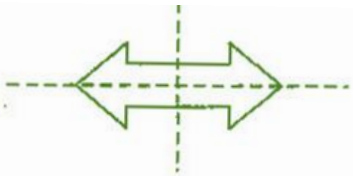
(a) 4. 

(b) 1. 

(c) 2. 

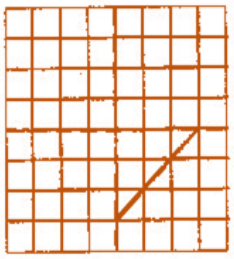
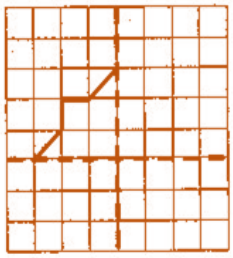
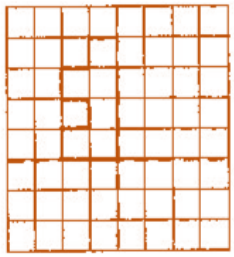
(d) 2. 

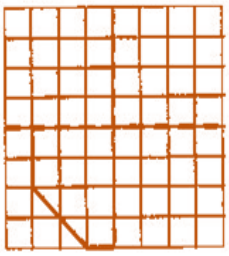
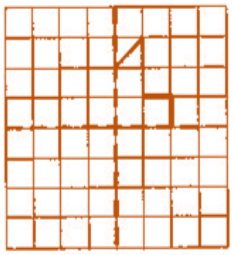
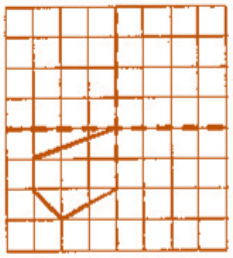
(e) 1. 

(f) 2. 

Question 2:

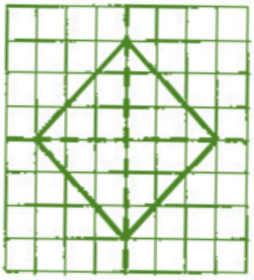
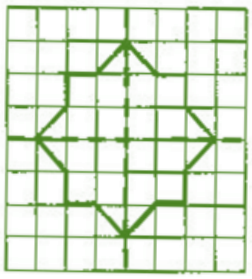
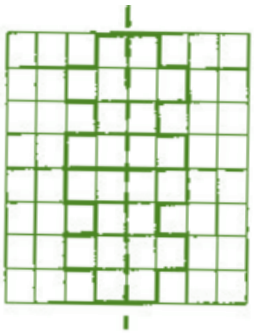
Copy the following drawing on squared paper. Complete each one of them such that the resulting figure has two dotted lines as two lines of symmetry.

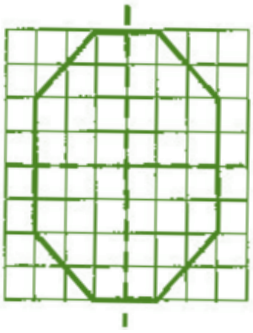
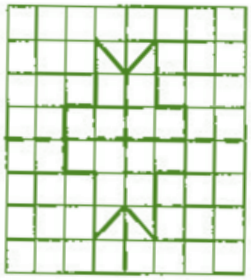
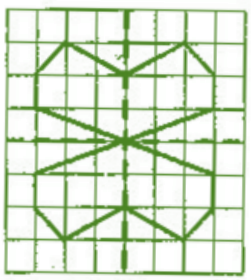
(a)  (b)  (c) 

(d)  (e)  (f) 

How did you go about completing the picture?

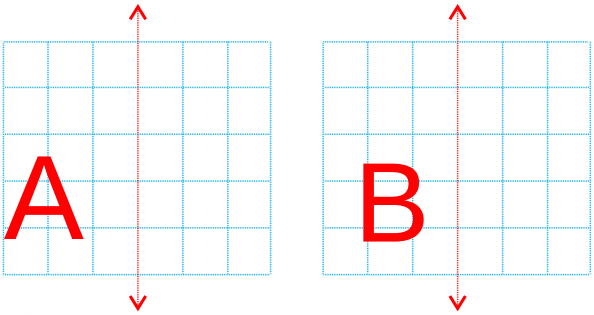
Answer 2:

(a)  (b)  (c) 

(d)  (e)  (f) 

Question 3:

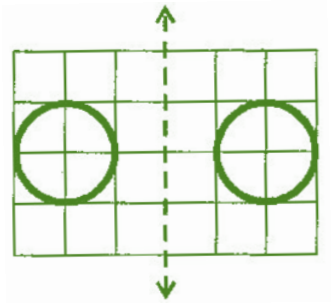
In each figure below, a letter of alphabet is shown along with a vertical line. Take the mirror image of the letter in the given line. Find which letters look the same after reflection (i.e., which letters look the same in the image) and which do not. Can you guess why?



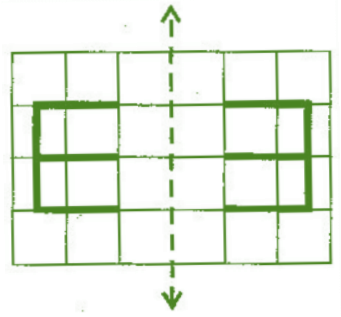
Try for O E M N P H L T S V X

Answer 3:

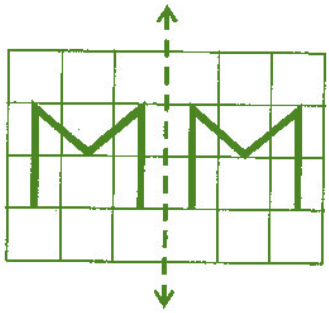
Same after reflection



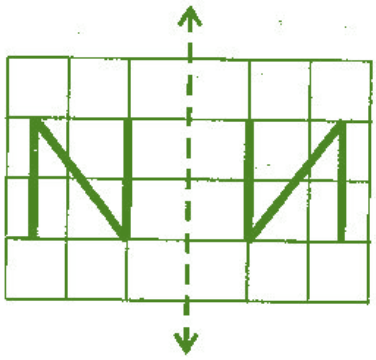
Different after reflection



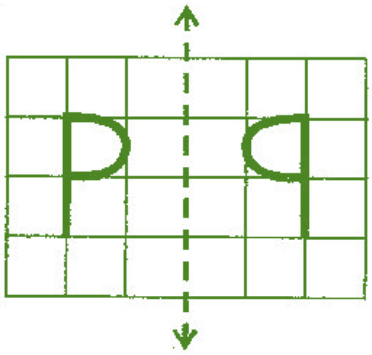
Same after reflection



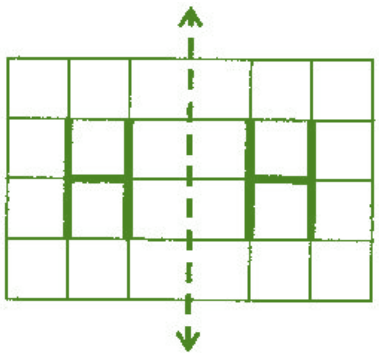
Different after reflection



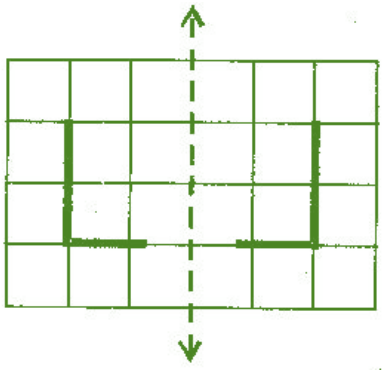
Different after reflection



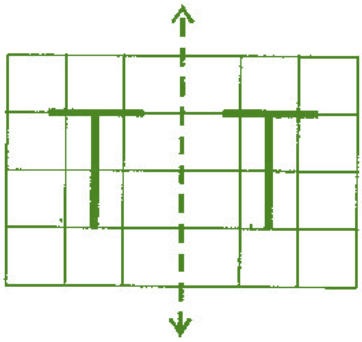
Same after reflection



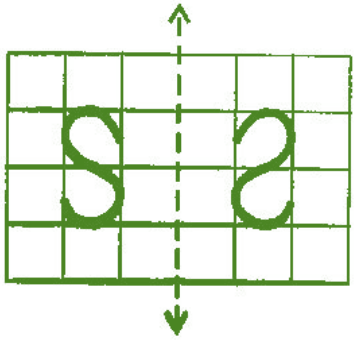
Different after reflection



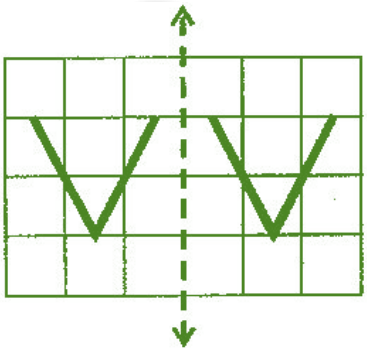
Same after reflection



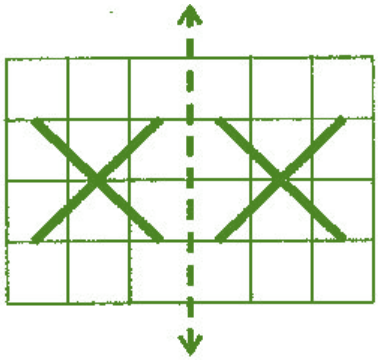
Different after reflection



Same after reflection



Same after reflection



Mathematics

(Chapter – 14) (Practical Geometry)

(Class – VI)

Exercise 14.1

Question 1:

Draw a circle of radius 3.2 cm.

Answer 1:

Steps of construction:

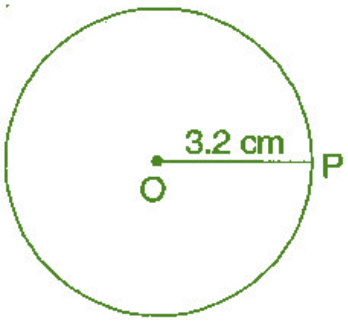
(a) Open the compass for the required radius of 3.2 cm.

(b) Make a point with a sharp pencil where we want the centre of circle to be.

(c) Name it O.

(d) Place the pointer of compasses on O.

(e) Turn the compasses slowly to draw the circle.



Hence, it is the required circle.

Question 2:

With the same centre O, draw two circles of radii 4 cm and 2.5 cm.

Answer 2:

Steps of construction:

(a) Marks a point 'O' with a sharp pencil where we want the centre of the circle.

(b) Open the compasses 4 cm.

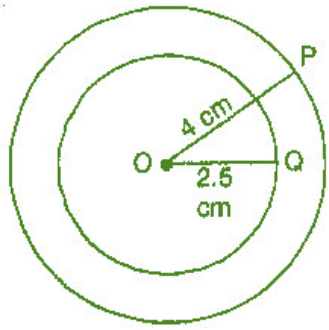
(c) Place the pointer of the compasses on O.

(d) Turn the compasses slowly to draw the circle.

(e) Again open the compasses 2.5 cm and place the pointer of the compasses on D.

(f) Turn the compasses slowly to draw the second circle.

Hence, it is the required figure.



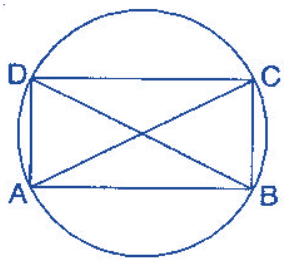
Question 3:

Draw a circle and any two of its diameters. If you join the ends of these diameters, what is the figure obtained if the diameters are perpendicular to each other? How do you check your answer?

Answer 3:

(i) By joining the ends of two diameters, we get a rectangle. By measuring, we find AB = CD = 3 cm, BC = AD = 2 cm, i.e., pairs of opposite sides are equal and also $\angle A = \angle B = \angle C = \angle D = 90^\circ$, , i.e. each angle is of 90°.

Hence, it is a rectangle.

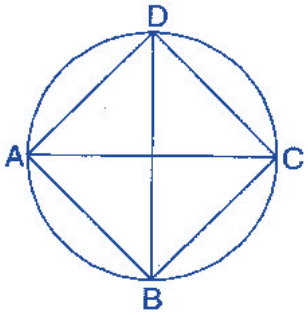


(ii) If the diameters are perpendicular to each other, then by joining the ends of two diameters, we get a square.

By measuring, we find that AB = BC = CD = DA = 2.5 cm, i.e., all four sides are equal.

Also $\angle A = \angle B = \angle C = \angle D = 90^\circ$, , i.e. each angle is of 90°.

Hence, it is a square.



Question 4:

Draw any circle and mark points A, B and C such that:

(a) A is on the circle.

(b) B is in the interior of the circle.

(c) C is in the exterior of the circle.

Answer 4:

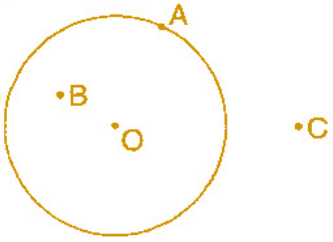
(i) Mark a point 'O' with sharp pencil where we want centre of the circle.

(ii) Place the pointer of the compasses at 'O'. Then move the compasses slowly to draw a circle.

(a) Point A is on the circle.

(b) Point B is in interior of the circle.

(c) Point C is in the exterior of the circle.



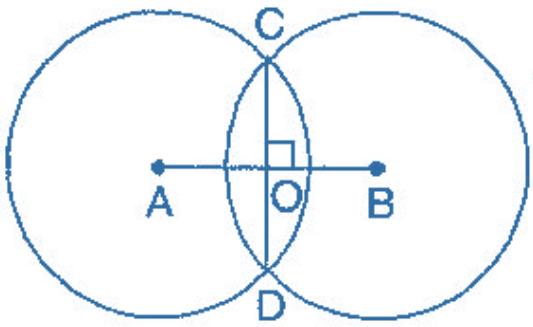
Question 5:

Let A, B be the centres of two circles of equal radii; draw them so that each one of them passes through the centre of the other. Let them intersect at C and D. Examine whether $\overline{AB}$ and $\overline{CD}$ are at right angles.

Answer 5:

Draw two circles of equal radii taking A and B as their centre such that one of them passes through the centre of the other. They intersect at C and D. Join AB and CD.

Yes, AB and CD intersect at right angle as $\angle COB$ is 90°.



Exercise 14.2

Question 1:

Draw a line segment of length 7.3 cm, using a ruler.

Answer 1:

Steps of construction:

(i) Place the zero mark of the ruler at a point A.

(ii) Mark a point B at a distance of 7.3 cm from A.

(iii) Join AB.

Hence, $\overline{AB}$ is the required line segment of length 7.3 cm.

Question 2:

Construct a line segment of length 5.6 cm using ruler and compasses.

Answer 2:

Steps of construction:

(i) Draw a line 'l'. Mark a point A on this line.

(ii) Place the compasses pointer on zero mark of the ruler. Open it to place the pencil point up to 5.6 cm mark.

(iii) Without changing the opening of the compasses. Place the pointer on A and cut an arc 'l' at B.

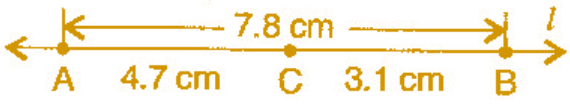
$\overline{AB}$ is the required line segment of length 5.6 cm.

Question 3:

Construct $\overline{AB}$ of length 7.8 cm. From this cut off $\overline{AC}$ of length 4.7 cm. Measure $\overline{BC}$.

Answer 3:

Steps of construction:



(i) Place the zero mark of the ruler at A.

(ii) Mark a point B at a distance 7.8 cm from A.

(iii) Again, mark a point C at a distance 4.7 from A.

Hence, by measuring $\overline{BC}$, we find that BC = 3.1 cm

Question 4:

Given $\overline{AB}$ of length 3.9 cm, construct $\overline{PQ}$ such that the length $\overline{PQ}$ is twice that of $\overline{AB}$. Verify by measurement.

(**Hint**: Construct $\overline{PX}$ such that length of $\overline{PX}$ = length of $\overline{AB}$; then cut off $\overline{XQ}$ such that $\overline{XQ}$ also has the length of $\overline{AB}$.

Answer 4:

Steps of construction:

(i) Draw a line 'l'.

(ii) Construct $\overline{PX}$ such that length of $\overline{PX}$ = length of $\overline{AB}$

(iii) Then cut of $\overline{XQ}$ such that $\overline{XQ}$ also has the length of $\overline{AB}$.

(iv) Thus the length of $\overline{PX}$ and the length of $\overline{XQ}$ added together make twice the length of $\overline{AB}$.

Verification:

Hence, by measurement we find that PQ = 7.8 cm

= 3.9 cm + 3.9 cm

= $\overline{AB}$ + $\overline{AB}$ = 2 x $\overline{AB}$

Question 5:

Given $\overline{AB}$ of length 7.3 cm and $\overline{CD}$ of length 3.4 cm, construct a line segment $\overline{XY}$ such that the length of $\overline{XY}$ is equal to the difference between the lengths of $\overline{AB}$ and $\overline{CD}$. Verify by measurement.

Answer 5:

Steps of construction:

(i) Draw a line 'l' and take a point X on it.

(ii) Construct $\overline{XZ}$ such that length $\overline{XZ}$ = length of $\overline{AB}$ = 7.3 cm

(iii) Then cut off $\overline{ZY}$ = length of $\overline{CD}$ = 3.4 cm

(iv) Thus the length of $\overline{XY}$ = length of $\overline{AB}$ – length of $\overline{CD}$

Verification:

Hence, by measurement we find that length of $\overline{XY}$ = 3.9 cm

= 73. Cm – 3.4 cm

= $\overline{AB} - \overline{CD}$

Exercise 14.3

Question 1:

Draw any line segment $\overline{PQ}$. Without measuring $\overline{PQ}$, construct a copy of $\overline{PQ}$.

Answer 1:

Steps of construction:

(i) Given $\overline{PQ}$ whose length is not known.

(ii) Fix the compasses pointer on P and the pencil end on Q. The opening of the instrument now gives the length of $\overline{PQ}$.

(iii) Draw any line 'l'. Choose a point A on 'l'. Without changing the compasses setting, place the pointer on A.

(iv) Draw an arc that cuts 'l' at a point, say B.

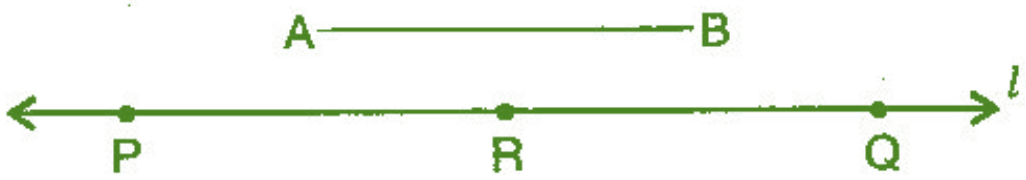
Hence, $\overline{AB}$ is the copy of $\overline{PQ}$.

Question 2:

Given some line segment $\overline{AB}$, whose length you do not know, construct $\overline{PQ}$ such that the length of $\overline{PQ}$ is twice that of $\overline{AB}$.

Answer 2:

Steps of construction:



(i) Given $\overline{AB}$ whose length is not known.

(ii) Fix the compasses pointer on A and the pencil end on B. The opening of the instrument now gives the length of $\overline{AB}$.

(iii) Draw any line 'l'. Choose a point P on 'l'. Without changing the compasses setting, place the pointer on Q.

(iv) Draw an arc that cuts 'l' at a point R.

(v) Now place the pointer on R and without changing the compasses setting, draw another arc that cuts 'l' at a point Q.

Hence, $\overline{PQ}$ is the required line segment whose length is twice that of AB.

Exercise 14.4

Question 1:

Draw any line segment $\overline{AB}$. Mark any point M on it. Through M, draw a perpendicular to $\overline{AB}$. (Use ruler and compasses)

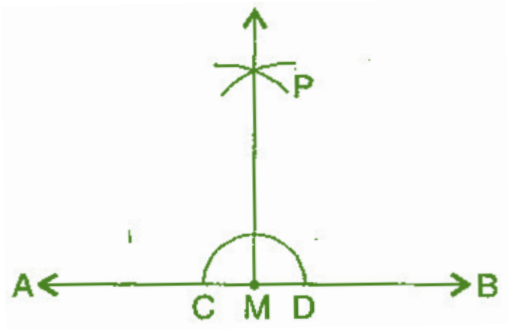
Answer 1:

Steps of construction:

(i) With M as centre and a convenient radius, draw an arc intersecting the line AB at two points C and B.

(ii) With C and D as centres and a radius greater than MC, draw two arcs, which cut each other at P.

(iii) Join PM. Then PM is perpendicular to AB through the point M.



Question 2:

Draw any line segment $\overline{PQ}$. Take any point R not on it. Through R, draw a perpendicular to $\overline{PQ}$. (Use ruler and set-square)

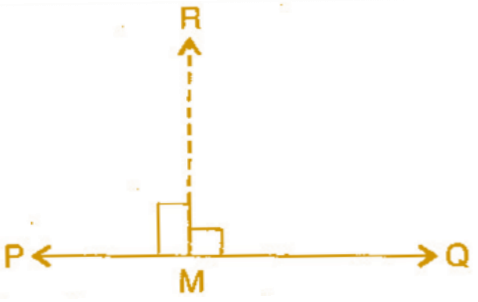
Answer 2:

Steps of construction:

(i) Place a set-square on $\overleftrightarrow{PQ}$ such that one arm of its right angle aligns along $\overleftrightarrow{PQ}$.

(ii) Place a ruler along the edge opposite to the right angle of the set-square.

(iii) Hold the ruler fixed. Slide the set square along the ruler till the point R touches the other arm of the set square.



(iv) Join RM along the edge through R meeting $\overleftrightarrow{PQ}$ at M. Then RM $\perp$ PQ.

Question 3:

Draw a line l and a point X on it. Through X, draw a line segment $\overline{XY}$ perpendicular to l. Now draw a perpendicular to $\overline{XY}$ to Y. (use ruler and compasses)

Answer 3:

Steps of construction:

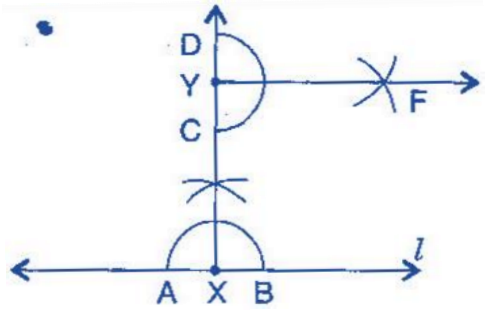
(i) Draw a line 'l' and take point X on it.

(ii) With X as centre and a convenient radius, draw an arc intersecting the line 'l' at two points A and B.

(iii) With A and B as centres and a radius greater than XA, draw two arcs, which cut each other at C.

(iv) Join AC and produce it to Y. Then XY is perpendicular to 'l'.

(v) With D as centre and a convenient radius, draw an arc intersecting XY at two points C and D.



(vi) With C and D as centres and radius greater than YD, draw two arcs which cut each other at F.

(vii) Join YF, then YF is perpendicular to XY at Y.

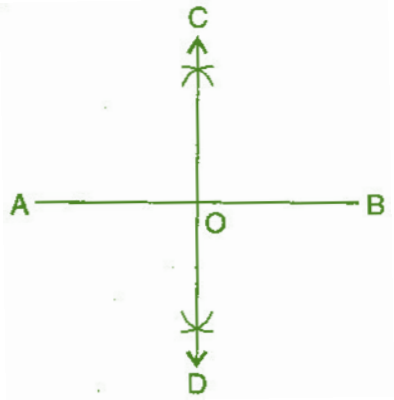
Exercise 14.5

Question 1:

Draw $\overline{AB}$ of length 7.3 cm and find its axis of symmetry.

Answer 1:

Axis of symmetry of line segment $\overline{AB}$ will be the perpendicular bisector of $\overline{AB}$. So, draw the perpendicular bisector of AB.



Steps of construction:

(i) Draw a line segment $\overline{AB}$ = 7.3 cm

(ii) Taking A and B as centres and radius more than half of AB, draw two arcs which intersect each other at C and D.

(iii) Join CD. Then CD is the axis of symmetry of the line segment AB.

Question 2:

Draw a line segment of length 9.5 cm and construct its perpendicular bisector.

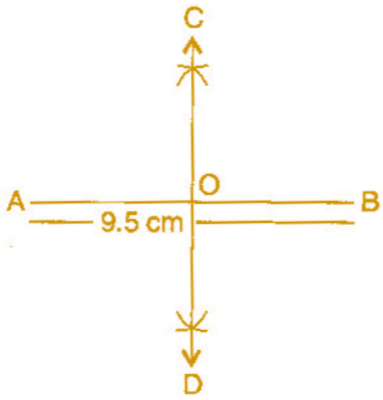
Answer 2:

Steps of construction:

(i) Draw a line segment $\overline{AB}$ = 9.5 cm

(ii) Taking A and B as centres and radius more than half of AB, draw two arcs which intersect each other at C and D.

(iii) Join CD. Then CD is the perpendicular bisector of $\overline{AB}$.



Question 3:

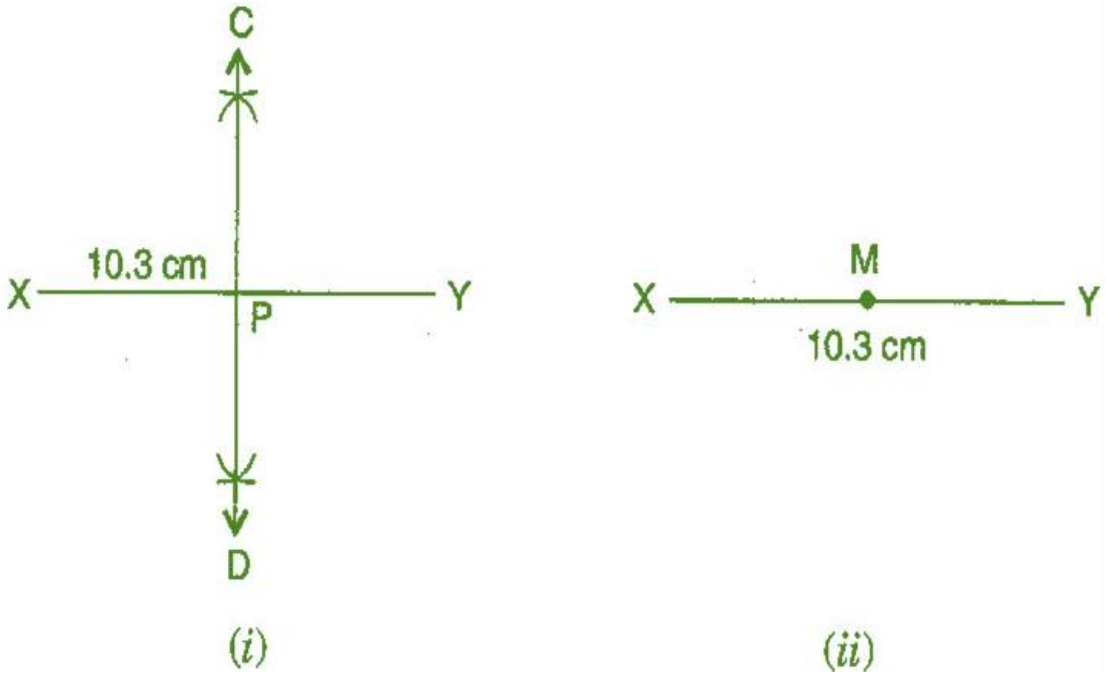
Draw the perpendicular bisector of $\overline{XY}$ whose length is 10.3 cm.

(a) Take any point P on the bisector drawn. Examine whether PX = PY.

(b) If M is the mid-point of $\overline{XY}$, what can you say about the lengths MX and XY?

Answer 3:

Steps of construction:



(i) Draw a line segment $\overline{XY}$ = 10.3 cm

(ii) Taking X and Y as centres and radius more than half of AB, draw two arcs which intersect each other at C and D.

(iii) Join CD. Then CD is the required perpendicular bisector of $\overline{XY}$.

Now:

(a) Take any point P on the bisector drawn. With the help of divider we can check that $\overline{PX} = \overline{PY}$.

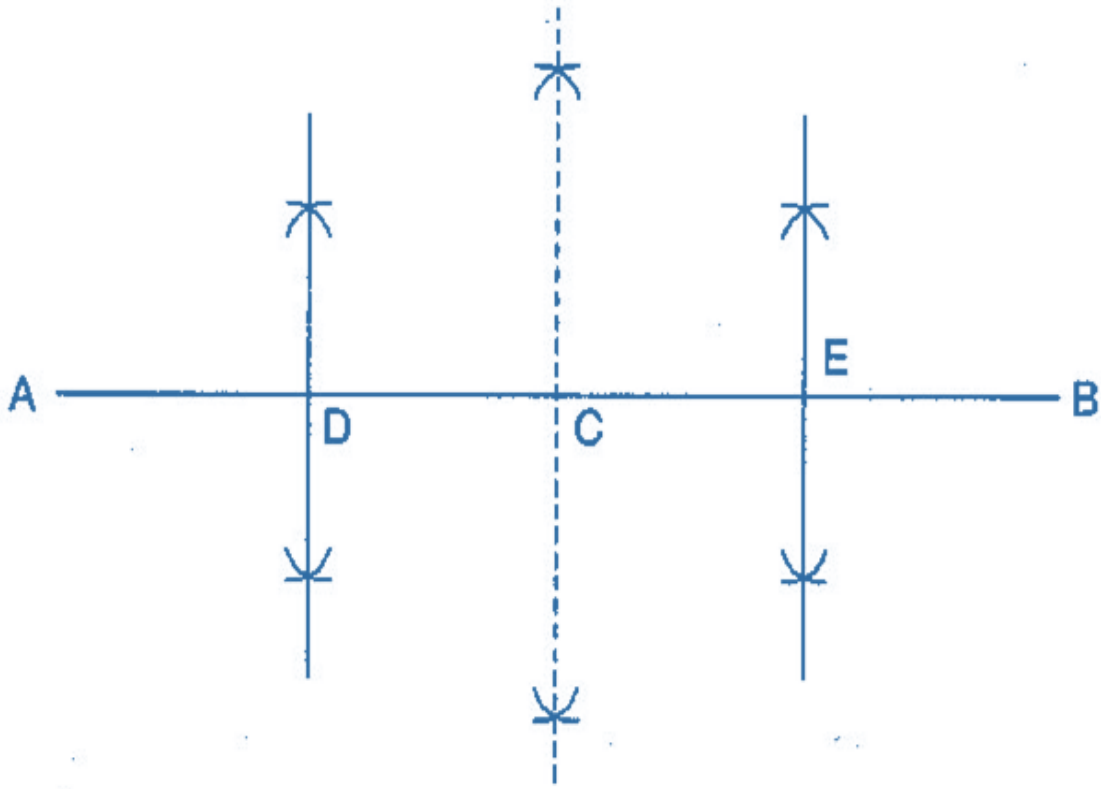
(b) If M is the mid-point of $\overline{XY}$, then $\overline{MX} = \frac{1}{2}\overline{XY}$.

Question 4:

Draw a line segment of length 12.8 cm. Using compasses, divide it into four equal parts. Verify by actual measurement.

Answer 4:

Steps of construction:



(i) Draw a line segment AB = 12.8 cm

(ii) Draw the perpendicular bisector of $\overline{AB}$ which cuts it at C. Thus, C is the mid-point of $\overline{AB}$.

(iii) Draw the perpendicular bisector of $\overline{AC}$ which cuts it at D. Thus D is the mid-point of .

(iv) Again, draw the perpendicular bisector of $\overline{CB}$ which cuts it at E. Thus, E is the mid-point of $\overline{CB}$.

(v) Now, point C, D and E divide the line segment $\overline{AB}$ in the four equal parts.

(vi) By actual measurement, we find that

$\overline{AD} = \overline{DC} = \overline{CE} = \overline{EB} = 3.2$ cm

Question 5:

With $\overline{PQ}$ of length 6.1 cm as diameter, draw a circle.

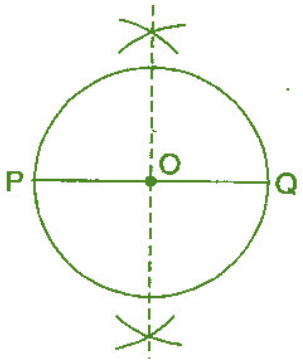
Answer 5:

Steps of construction:

(i) Draw a line segment $\overline{PQ}$ = 6.1 cm.

(ii) Draw the perpendicular bisector of PQ which cuts, it at O. Thus O is the mid-point of $\overline{PQ}$.

(iii) Taking O as centre and OP or OQ as radius draw a circle where diameter is the line segment $\overline{PQ}$.



Question 6:

Draw a circle with centre C and radius 3.4 cm. Draw any chord $\overline{AB}$. Construct the perpendicular bisector $\overline{AB}$ and examine if it passes through C.

Answer 6:

Steps of construction:

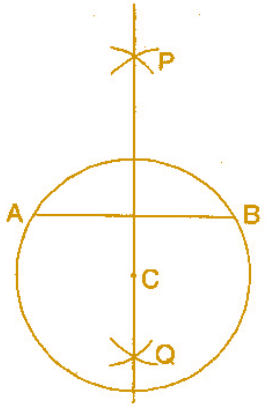
(i) Draw a circle with centre C and radius 3.4 cm.

(ii) Draw any chord $\overline{AB}$.

(iii) Taking A and B as centres and radius more than half of $\overline{AB}$, draw two arcs which cut each other at P and Q.

(iv) Join PQ. Then PQ is the perpendicular bisector of $\overline{AB}$.

(v) This perpendicular bisector of $\overline{AB}$ passes through the centre C of the circle.



Question 7:

Repeat Question 6, if $\overline{AB}$ happens to be a diameter.

Answer 7:

Steps of construction:

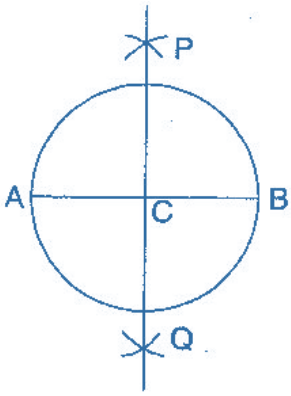
(i) Draw a circle with centre C and radius 3.4 cm.

(ii) Draw its diameter $\overline{AB}$.

(iii) Taking A and B as centres and radius more than half of it, draw two arcs which intersect each other at P and Q.

(iv) Join PQ. Then PQ is the perpendicular bisector of $\overline{AB}$.

(v) We observe that this perpendicular bisector of $\overline{AB}$ passes through the centre C of the circle.



Question 8:

Draw a circle of radius 4 cm. Draw any two of its chords. Construct the perpendicular bisectors of these chords. Where do they meet?

Answer 8:

Steps of construction:

(i) Draw the circle with O and radius 4 cm.

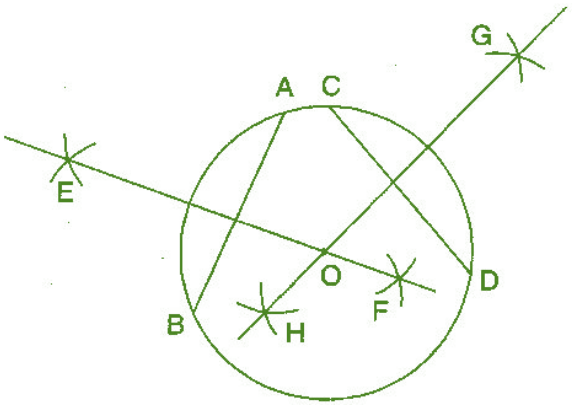
(ii) Draw any two chords $\overline{AB}$ and $\overline{CD}$ in this circle.

(iii) Taking A and B as centres and radius more than half AB, draw two arcs which intersect each other at E and F.

(iv) Join EF. Thus EF is the perpendicular bisector of chord $\overline{CD}$.

(v) Similarly draw GH the perpendicular bisector of chord $\overline{CD}$.

(vi) These two perpendicular bisectors meet at O, the centre of the circle.



Question 9:

Draw any angle with vertex O. Take a point A on one of its arms and B on another such that OA = OB. Draw the perpendicular bisectors of $\overline{OA}$ and $\overline{OB}$. Let them meet at P. Is PA = PB?

Answer 9:

Steps of construction:

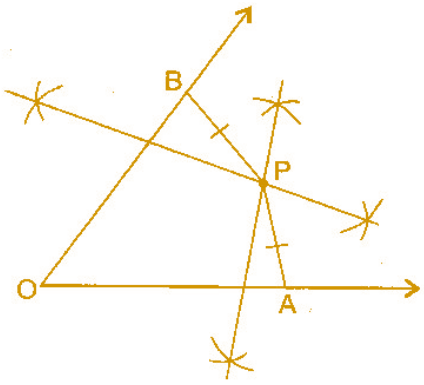
(i) Draw any angle with vertex O.

(ii) Take a point A on one of its arms and B on another such that OA = OB.

(iii) Draw perpendicular bisector of $\overline{OA}$ and $\overline{OB}$.

(iv) Let them meet at P. Join PA and PB.

(v) With the help of divider, we check that $\overline{PA} = \overline{PB}$.



Exercise 14.6

Question 1:

Draw $\angle POQ$ of measure $75°$ and find its line of symmetry.

Answer 1:

Steps of construction:

(a) Draw a line l and mark a point O on it.

(b) Place the pointer of the compasses at O and draw an arc of any radius which intersects the line l at A.

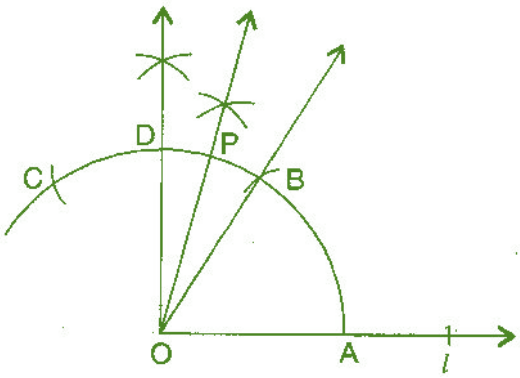
(c) Taking same radius, with centre A, cut the previous arc at B.

(d) Join OB, then $\angle BOA = 60°$.

(e) Taking same radius, with centre B, cut the previous arc at C.

(f) Draw bisector of $\angle BOC$. The angle is of $90°$. Mark it at D. Thus, $\angle DOA = 90°$

(g) Draw $\overline{OP}$ as bisector of $\angle DOB$.
Thus, $\angle POA = 75°$



Question 2:

Draw an angle of measure $147°$ and construct its bisector.

Answer 2:

Steps of construction:

(a) Draw a ray $\overleftarrow{OA}$.

(b) With the help of protractor, construct $\angle AOB = 147°$.

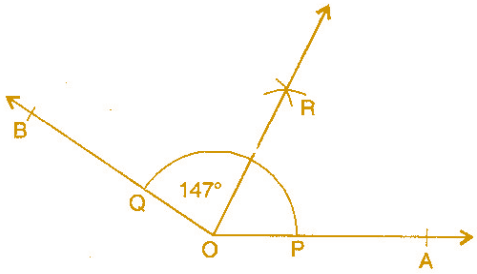
(c) Taking centre O and any convenient radius, draw an arc which intersects the arms $\overline{OA}$ and $\overline{OB}$ at P and Q respectively.

(d) Taking P as centre and radius more than half of PQ, draw an arc.

(e) Taking Q as centre and with the same radius, draw another arc which intersects the previous at R.

(f) Join OR and produce it.

(g) Thus, $\overline{OR}$ is the required bisector of $\angle AOB$.



Question 3:

Draw a right angle and construct its bisector.

Answer 3:

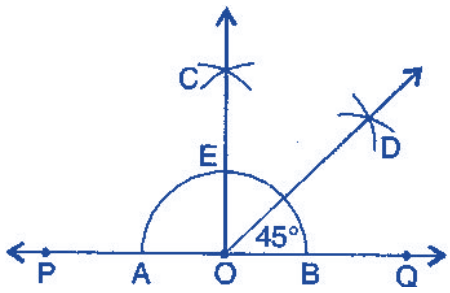
Steps of construction:

(a) Draw a line PQ and take a point O on it.

(b) Taking O as centre and convenient radius, draw an arc which intersects PQ at A and B.

(c) Taking A and B as centres and radius more than half of AB, draw two arcs which intersect each other at C.

(d) Join OC. Thus, $\angle COQ$ is the required right angle.



(e) Taking B and E as centre and radius more than half of BE, draw two arcs which intersect each other at the point D.

(f) Join OD. Thus, $\overline{OD}$ is the required bisector of $\angle COQ$.

Question 4:

Draw an angle of measure $153°$ and divide it into four equal parts.

Answer 4:

Steps of construction:

(a) Draw a ray $\overleftrightarrow{OA}$.

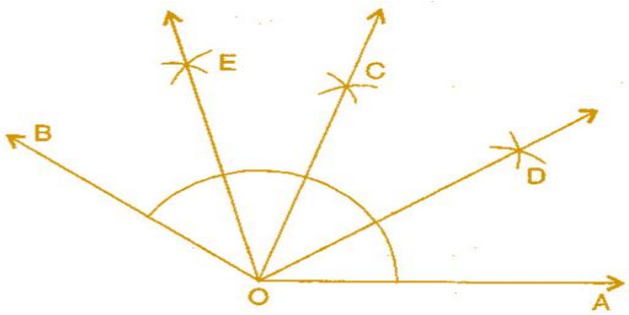
(b) At O, with the help of a protractor, construct $\angle AOB = 153°$.

(c) Draw $\overline{OC}$ as the bisector of $\angle AOB$.

(d) Again, draw $\overline{OD}$ as bisector of $\angle AOC$.

(e) Again, draw $\overline{OE}$ as bisector of $\angle BOC$.

(f) Thus, $\overline{OC}$, $\overline{OD}$ and $\overline{OE}$ divide $\angle AOB$ in four equal arts.



Question 5:

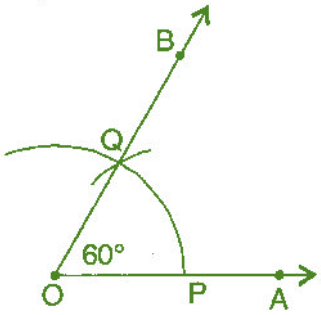
Construct with ruler and compasses, angles of following measures:

(a) 60° (b) 30° (c) 90° (d) 120° (e) 45° (f) 135°

Answer 5:

Steps of construction:

(a) 60°



(i) Draw a ray $\overleftrightarrow{OA}$.

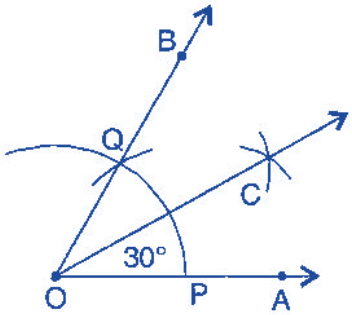
(ii) Taking O as centre and convenient radius, mark an arc, which intersects $\overleftrightarrow{OA}$ at P.

(iii) Taking P as centre and same radius, cut previous arc at Q.

(iv) Join OQ.

Thus, $\angle$ BOA is required angle of 60°.

(b) 30°



(i) Draw a ray $\overleftrightarrow{OA}$.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects $\overleftrightarrow{OA}$ at P.

(iii) Taking P as centre and same radius, cut previous arc at Q.

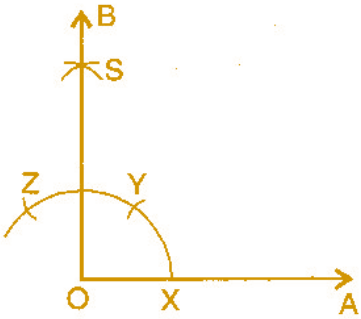
(iv) Join OQ. Thus, $\angle$ BOA is required angle of 60°.

(v) Put the pointer on P and mark an arc.

(vi) Put the pointer on Q and with same radius, cut the previous arc at C.

Thus, $\angle$ COA is required angle of 30°.

(c) 90°



(i) Draw a ray $\overleftrightarrow{OA}$.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects $\overleftrightarrow{OA}$ at X.

(iii) Taking X as centre and same radius, cut previous arc at Y.

(iv) Taking Y as centre and same radius, draw another arc intersecting the same arc at Z.

(v) Taking Y and Z as centres and same radius, draw two arcs intersecting each other at S.

(vi) Join OS and produce it to form a ray OB.

Thus, $\angle$ BOA is required angle of 90°.

(d) 120°

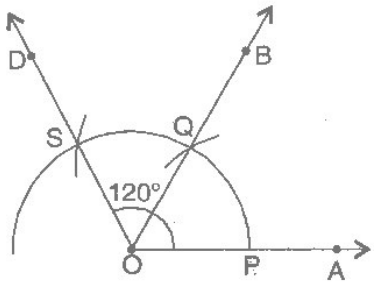
(i) Draw a ray $\overleftarrow{OA}$.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects $\overleftarrow{OA}$ at P.

(iii) Taking P as centre and same radius, cut previous arc at Q.

(iv) Taking Q as centre and same radius cut the arc at S.

(v) Join OS.



Thus, ∠ AOD is required angle of 120°.

(e) 45°

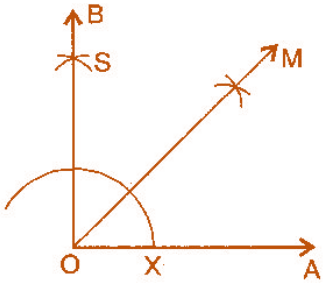
(i) Draw a ray $\overleftarrow{OA}$.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects $\overleftarrow{OA}$ at X.

(iii) Taking X as centre and same radius, cut previous arc at Y.

(iv) Taking Y as centre and same radius, draw another arc intersecting the same arc at Z.

(v) Taking Y and Z as centres and same radius, draw two arcs intersecting each other at S.



(vi) Join OS and produce it to form a ray OB. Thus, ∠ BOA is required angle of 90°.

(vii) Draw the bisector of ∠ BOA.

Thus, ∠ MOA is required angle of 45°.

(f) 135°

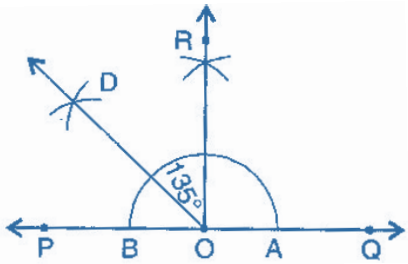
(i) Draw a line PQ and take a point O on it.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects PQ at A and B.

(iii) Taking A and B as centres and radius more than half of AB, draw two arcs intersecting each other at R.

(iv) Join OR. Thus, ∠ QOR = ∠ POQ = 90°.

(v) Draw $\overrightarrow{OD}$ the bisector of ∠ POR.



Thus, ∠ QOD is required angle of 135°.

Question 6:

Draw an angle of measure 45° and bisect it.

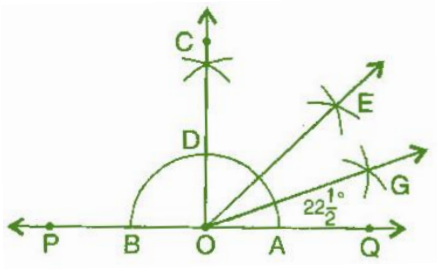
Answer 6:

Steps of construction:

(a) Draw a line PQ and take a point O on it.

(b) Taking O as centre and a convenient radius, draw an arc which intersects PQ at two points A and B.

(c) Taking A and B as centres and radius more than half of AB, draw two arcs which intersect each other at C.



(d) Join OC. Then $\angle COQ$ is an angle of 90°

(e) Draw $\overrightarrow{OE}$ as the bisector of $\angle COE$. Thus, $\angle QOE = 45^\circ$

(f) Again draw $\overrightarrow{OG}$ as the bisector of $\angle QOE$.

Thus, $\angle QOG = \angle EOG = 22\frac{1}{2}^\circ$.

Question 7:

Draw an angle of measure 135° and bisect it.

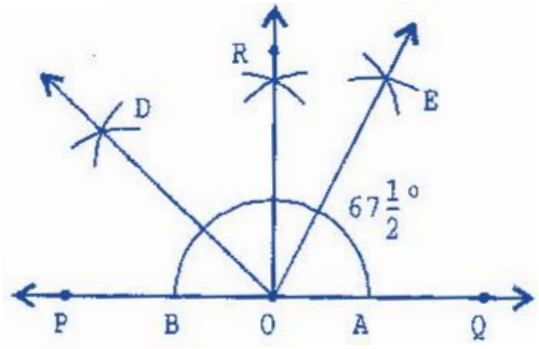
Answer 7:

Steps of construction:

(a) Draw a line PQ and take a point O on it.

(b) Taking O as centre and convenient radius, mark an arc, which intersects PQ at A and B.

(c) Taking A and B as centres and radius more than half of AB, draw two arcs intersecting each other at R.



(d) Join OR. Thus, $\angle QOR = \angle POQ = 90^\circ$.

(e) Draw $\overrightarrow{OD}$ the bisector of $\angle POR$. Thus, $\angle QOD$ is required angle of 135°.

(f) Now, draw $\overrightarrow{OE}$ as the bisector of $\angle QOD$.

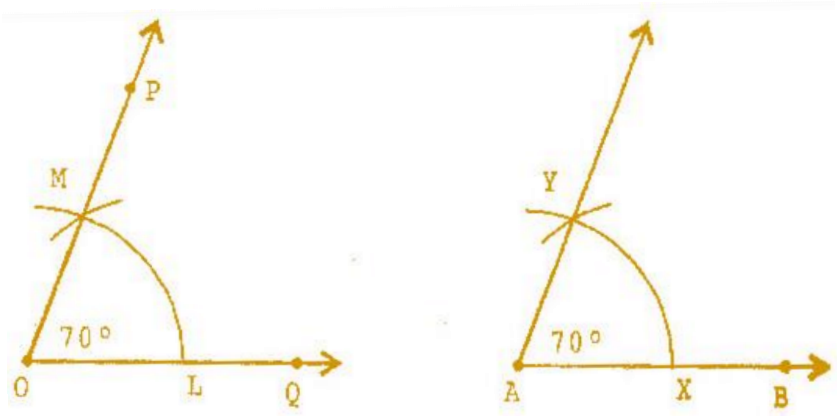
Thus, $\angle QOE = \angle DOE = 67\frac{1}{2}^\circ$

Question 8:

Draw an angle of 70°. Make a copy of it using only a straight edge and compasses.

Answer 8:

Steps of construction:



(a) Draw an angle 70° with protractor, i.e., ∠ POQ = 70°

(b) Draw a ray $\overrightarrow{AB}$.

(c) Place the compasses at O and draw an arc to cut the rays of ∠ POQ at L and M.

(d) Use the same compasses, setting to draw an arc with A as centre, cutting AB at X.

(e) Set your compasses setting to the length LM with the same radius.

(f) Place the compasses pointer at X and draw the arc to cut the arc drawn earlier at Y.

(g) Join AY.

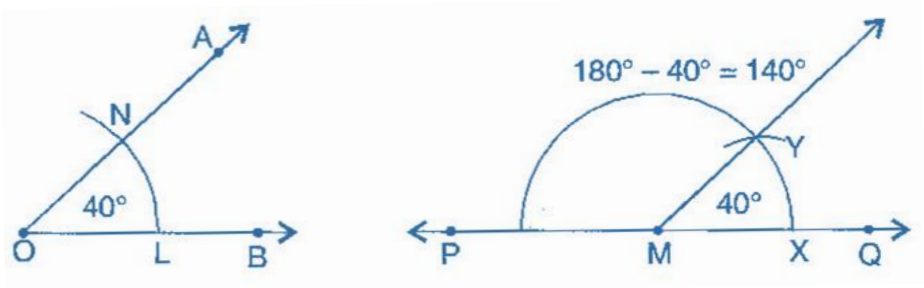
Thus, ∠ YAX = 70°

Question 9:

Draw an angle of 40°. Copy its supplementary angle.

Answer 9:

Steps of construction:



(a) Draw an angle of $40°$ with the help of protractor, naming $\angle$ AOB.
(b) Draw a line PQ.
(c) Take any point M on PQ.
(d) Place the compasses at O and draw an arc to cut the rays of $\angle$ AOB at L and N.
(e) Use the same compasses setting to draw an arc O as centre, cutting MQ at X.
(f) Set your compasses to length LN with the same radius.
(g) Place the compasses at X and draw the arc to cut the arc drawn earlier Y.
(h) Join MY.
Thus, $\angle$ QMY = $40°$ and $\angle$ PMY is supplementary of it.