Class –VI Mathematics (Ex. 9.1)
Questions

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	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?

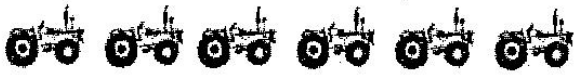
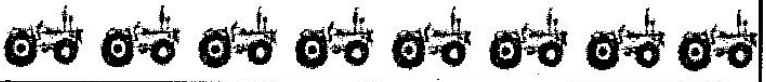
2. Following is the choice of sweets of 30 students of Class VI.
   Ladoo, Barfi, Ladoo, jalebi, Ladoo, Rashulla, Jalebi, Ladoo, Barfi, Rasgulla, Ladoo, Jalebi, Jalebi, Rashulla, Ladoo, Rasgulla, Jalebi, Ladoo, Rasgulla, Ladoo, Ladoo, Barfi, Rasgulla, Rasgulla, Jalebi, Rasgulla, Ladoo, Rasgulla, Jalebi, Ladoo
   (a) Arrange the names of sweets in a table using tally marks.
   (b) Which sweet is preferred by most of the students?

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.

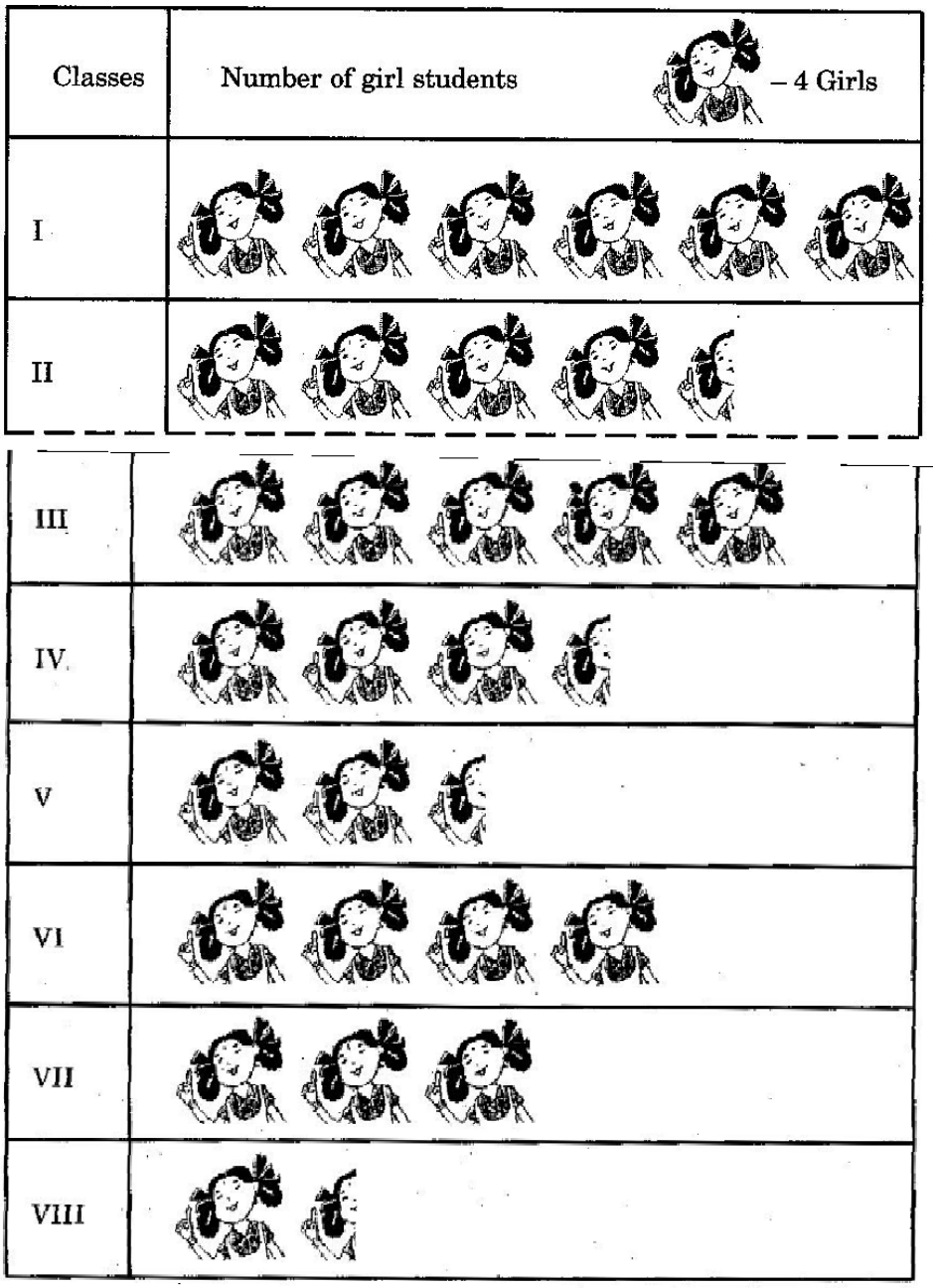
4. Following pictograph shows the number of tractors in five villages:

Villages	No. of tractors  – 1 tractor
Village A	
Village B	
Village C	
Village D	
Village E	

   Observe the pictograph and answer the following questions:

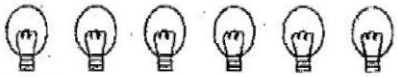
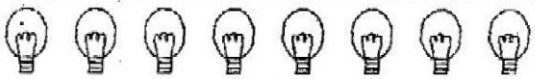
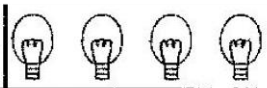
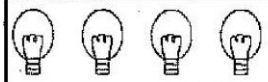
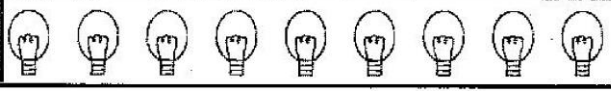
(i) Which village has the minimum number of tractors?
(ii) Which village has the maximum number of tractors?
(iii) How many more tractors village C has as compared to village B.
(iv) What is the total number of tractors in all the five villages?

5. The number of girl students in each class of a co-educational middle school is depicted by the pictograph.



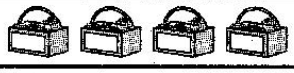
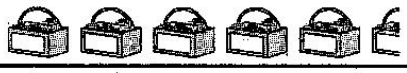
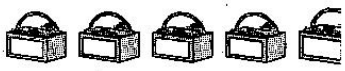
Observe this pictograph and answer the following questions:
(a) Which class has the minimum number of girl students?
(b) Is the number of girls in class VI less than the number of girls in class V?
(c) How many girls are there in class VII?

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	

What can be conclude from the said pictograph?

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?

Class –VI Mathematics (Ex. 9.1)

Answers

1. Sol.

Marks	Tally Marks	No. of students
1	| |	2
2	| | |	3
3	| | |	3
4	𝍸 | |	7
5	𝍸 |	6
6	𝍸 | |	7
7	𝍸 𝍸	5
8	| | | |	4
9	| | |	3

(a) Twelve students (b) Eight students

2. (a) Sol.

Sweets	Tally Marks	No. of students
Ladoo	𝍸 𝍸 |	11
Barfi	| | |	3
Jalebi	𝍸 | |	7
Rasgulla	𝍸 | | | |	9
		30

(b) Ladoo. Because 11 students prefer eat.

3. Sol.

Numbers	Tally Marks	How many times?
1	𝍸 | |	7
2		6
3	𝍸 𝍸	5
4	| | | |	4
5	𝍸 𝍸 |	11
6	𝍸 | |	7

(a) The minimum number of times = 4
(b) The maximum number of times = 5
(c) 1 and 6

4. (i) Village D (ii) Village C (iii) 3 (iv) 28
5. (a) Class VIII (b) No (c) 3 x 4 = 12 girls
6. (a) Number of bulbs sold on Monday are 12. Similarly, number of bulbs sold on other days can be found.
   (b) Maximum number of bulbs were sold on Sunday.
   (c) Same number of bulbs were sold on Wednesday and Saturday.
   (d) Then minimum number of bulbs were sold on Wednesday and Saturday.
   (e) The total number of bulbs sold in the given week were 86.

7. (a) Martin
   (b) 7 x 100 = 700 fruit basket
   (c) Anwar, Martin, Ranjit Singh

Class –VI Mathematics (Ex. 9.2)
Questions

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?

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?

Class –VI Mathematics (Ex. 9.2)
Answers

1. Sol.

	⊗ = 10 animals
Village A	80
Village B	120
Village C	90
Village D	40
Village E	60

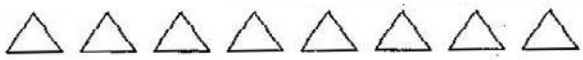
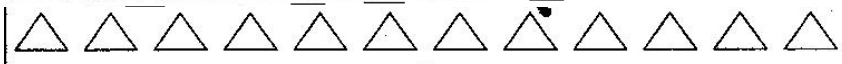
(a) 6 (b) Village B (c) Village C has more animals than Village A

2. A.

Years	= 100 students
1996	
1998	
2000	
2002	
2004	

(a) 6
(b) Five completed and one incompleted.

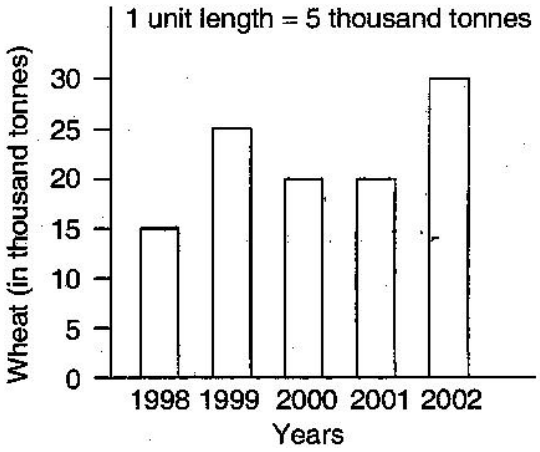
B.

Years	△ = 50 students
1996	
1998	
2000	
2002	
2004	

Pictograph B is more informative than A.

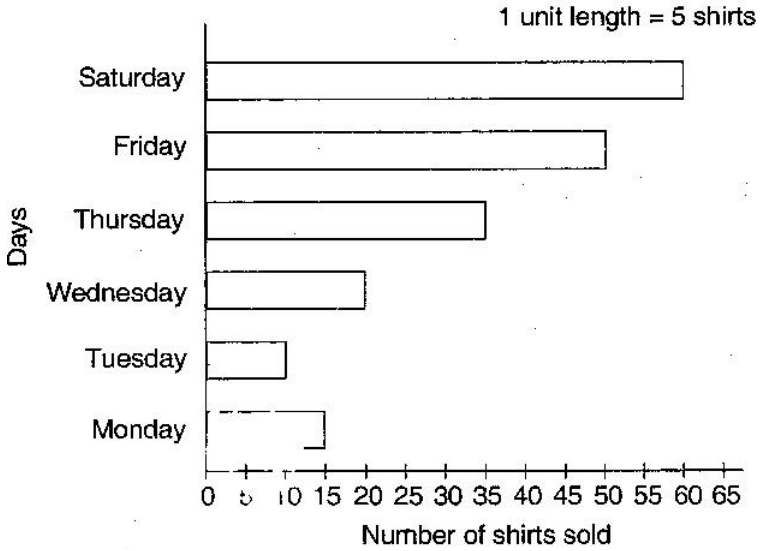
Class –VI Mathematics (Ex. 9.3)
Questions

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?

2. Observe this bar graph which is showing the sale of shirts in a readymade shop from Monday to Saturday.

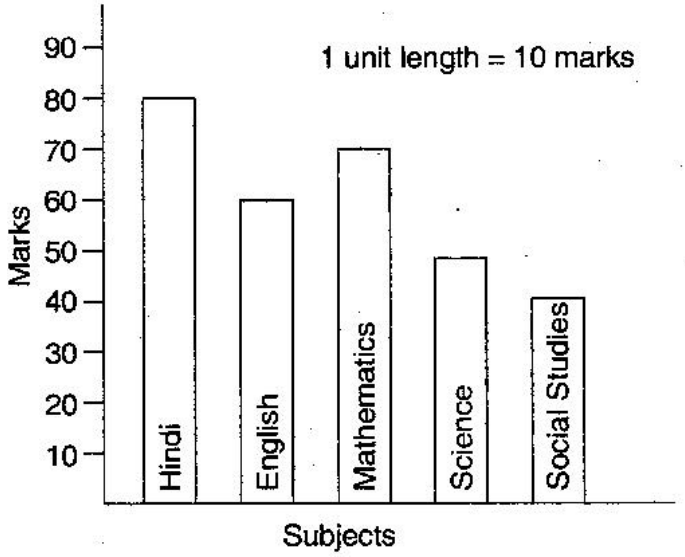


Now answer the following questions:
(a) What information does the above bar graph give?
(b) What is the scale chosen on the horizontal line representing number of shirts?
(c) On which day were the maximum number of shirts sold? How many shirts were sold on that day?

(d) On which day were the minimum number of shirts sold?

(e) How many shirts were sold on Thursday?

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.

Class –VI Mathematics (Ex. 9.3)

Answers

1. (a) In 2002, production of wheat was maximum.
   (b) In 1998, production of wheat was minimum.

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.

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.

Class –VI Mathematics (Ex. 9.4)
Questions

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?

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.

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?

4. Number of persons in various age groups in a town is given in the following table:

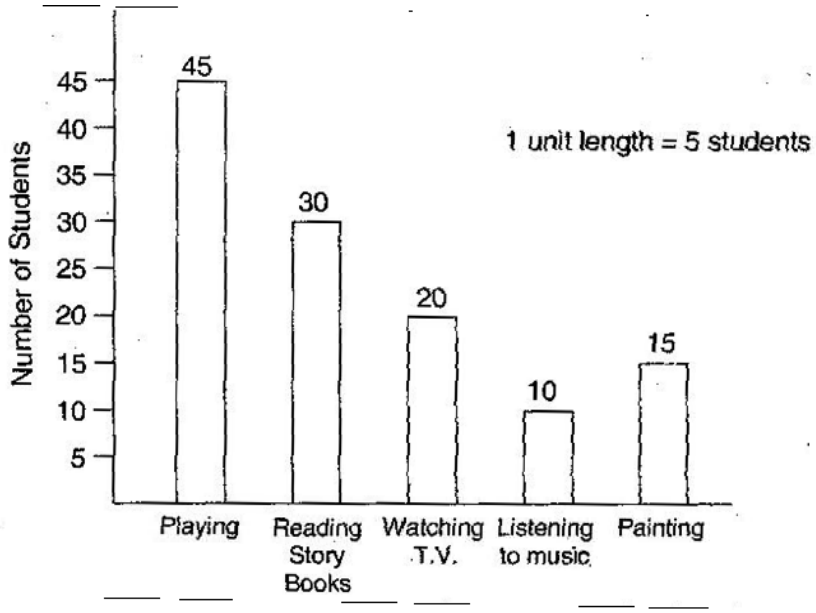
Age Group	Number of persons
1 – 14	2 Lakhs
15 – 29	1 lakh 60 thousands
30 – 44	1 lakh 20 thousands
45 – 59	1 lakh 20 thousands
60 – 74	80 thousands
75 and above	40 thousands

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?

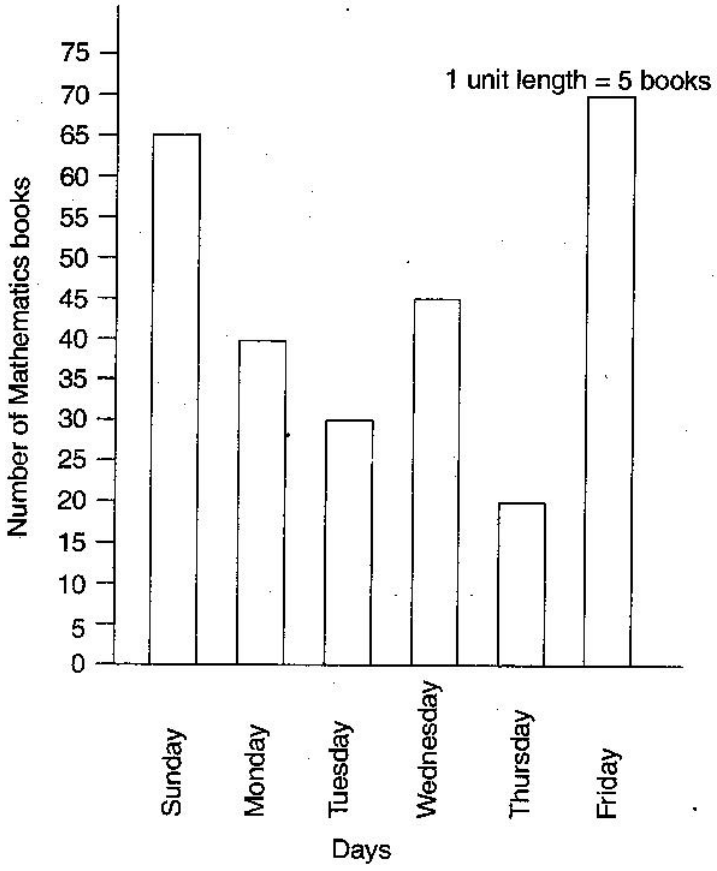
Class –VI Mathematics (Ex. 9.4)

Answers

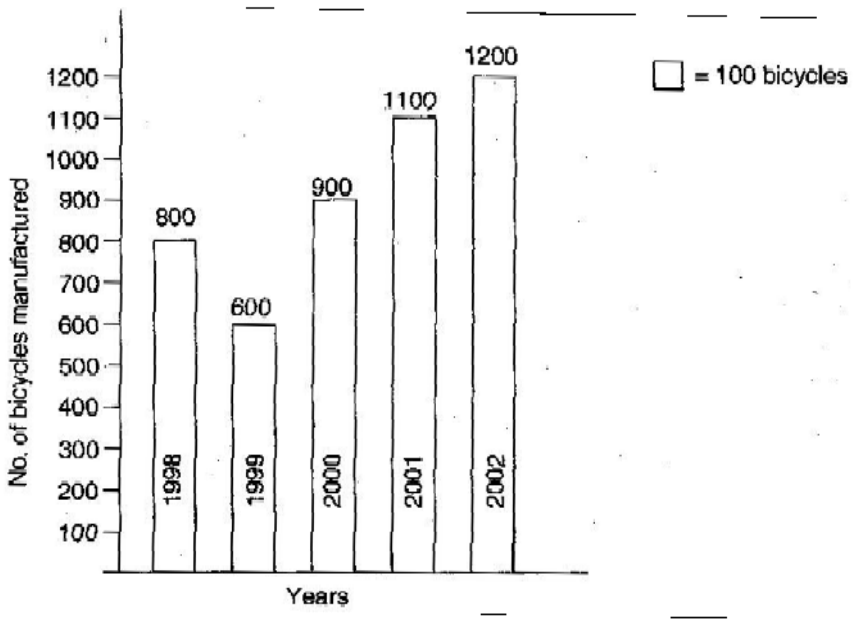
1. Sol.



2. Sol.

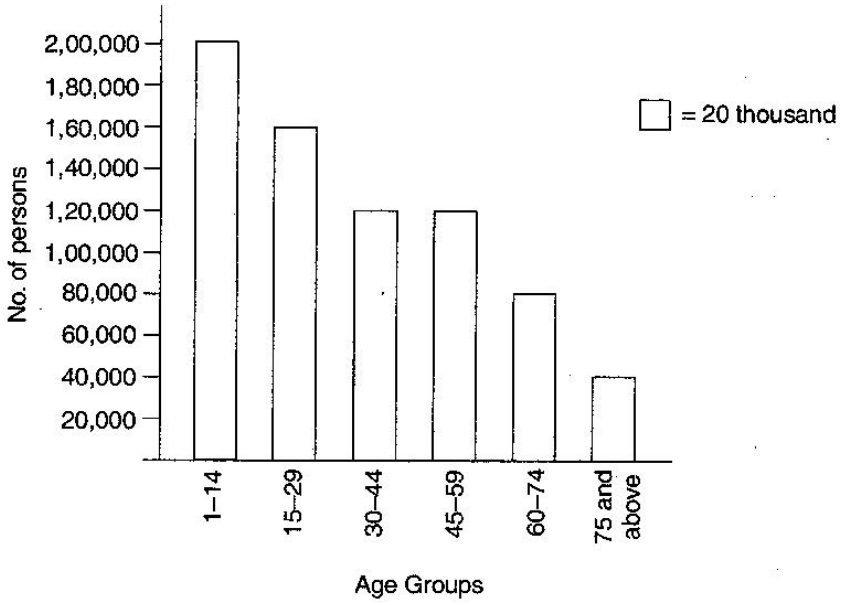


3. Sol.



(a) 2002 (b) 1999

4. Sol.



(a) Group 30 – 44 and group 45 – 59
(b) 80,000 + 40,000 = 1,20,000

Chapter 9 : Data Handling

MIND MAP

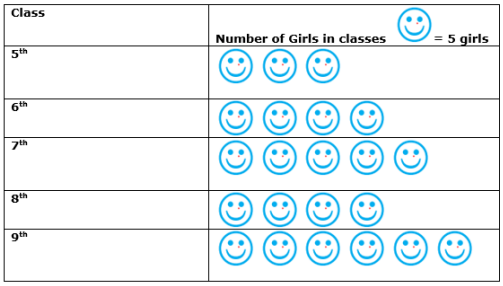
TYPE: 1

Q1. In an examination, the grades achieved by 40 students of a class are given below
B, C, C, E, A, C, B, B, D, D, D, D, B, C, C, C, A, C, B, E, A, D, C, B, E, C, B, E, C, D, A, B, C, E, D, D, A, A, C, E

(a) Arrange the grades using tally marks
(a) How many students get grade A?
(c) How many students get grade E?
(d) The grade where maximum students are present
(e) The grade where minimum students are present

Q2. The marks (out of 10) obtained by 35 students in a Science test are listed as below:
8, 1, 2, 6, 5, 5, 5, 0, 1, 9, 7, 8, 0, 5, 8, 3, 0, 8, 10, 10, 3, 4, 8, 7, 8, 9, 2, 0 ,9,6,7,0,1,3,2
a) Find the number of students who obtained marks more than or equal to 5
b) Find the numbers of students who scored zero in the test?
c) If the passing criterion is equal or above six, what is the passing percentage?

Q3. Following pictograph shows the number of girls in five classes.



Answer the below questions:
(a) Which class has the minimum number of girls?
(b) Which class has the maximum number of girls?
(c) How many girls are there in Class 6?
(d) What is the total number of girls in the Classes 6 to 9?

TYPE: 2

Q1. Rakesh threw a dice 20 times and noted the number appearing each time as shown below:
4 3 5 5 6 2 5 4 6 1
6 5 4 4 6 1 5 5 1 1
Prepare a frequency distribution table for the given data.

Q2. The marks obtained by 40 students of a class in an examination are given below:
8, 47, 22, 31, 17, 13, 38, 26, 3, 34, 29, 11, 22, 7, 15, 24, 38, 31, 21, 35, 42, 24, 45, 23, 21, 27, 29, 49, 25, 48, 21, 15, 18, 27, 19, 45, 14, 34, 37, 34
Prepare a frequency distribution table with equal class intervals, starting from 0-10 (where 10 is not included).

Q3. The electricity bills (in dollars) of 25 houses of a certain locality for a month are given below:
324, 700, 617, 400, 356, 365, 435, 506, 548, 736, 780, 378, 570, 685, 312, 630, 584,

674, 754, 776, 596, 745, 565, 763, 472
Arrange the above data in increasing order and form a frequency table.

TYPE: 3

Q1. The number of ATMs of different banks in a Hyderabad city is shown below

Name of the bank	**Number of ATMS**
State Bank of India	35
ICICI bank	30
Vijaya Bank	10
Dena Bank	15
Citibank	5
HSBC	5
Bank of Baroda	25

Draw a bar graph to represent the above information by choosing the scale of your choice and then answer below questions
a) which bank has highest number of ATM?
b) how many total banks are present in Hyderabad
c) which two banks have same of number of ATMS.

Q2. Number of children in six different classes are given below. Represent the data on a bar graph.

Class	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
No. of children	135	120	95	100	90	80

(i) Which class has the maximum number of children? And the minimum?

(ii) Find the ratio of students of class sixth to the students of class eighth.

TYPE: 4

Q1.

In the library of a school there are the books on the following subjects in given numbers: **English** — 100, **History** — 500, **Math** — 200, **Science** — 300

Draw the pictograph of the above numerical data. Find the information on the basis of answers to the given questions.

(i) How many books are there in the library?

(ii) On which subjects are there maximum and minimum number of books?

ACHEIVER'S SECTION (HOTS)

Q1 The number of bed-sheets manufactured by a factory during five consecutive weeks is given below.

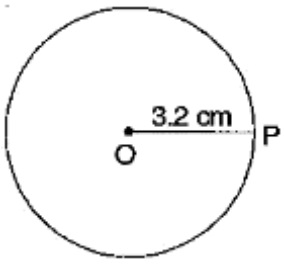
Week	First	Second	Third	Fourth	Fifth
Number of Bed-sheets	620	855	715	300	935

Draw the bar graph representing the above data.

Class 6 CH 14. Practical Geometry

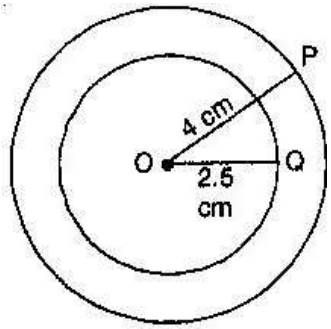
Class –VI Mathematics (Ex. 14.1)
Answers

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.



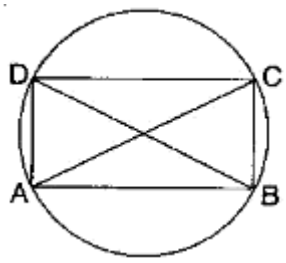
   It is required circle.

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.

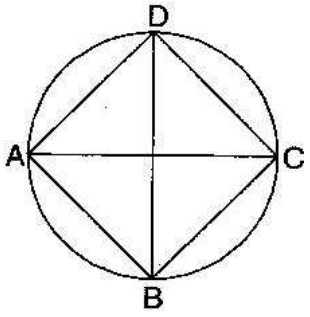


   It is the required figure.

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°.
   Henc,e 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.



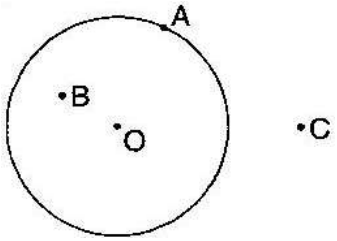
4. (i) Mark a point 'O' with sharp pencil where we want centre of the circle.

(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.

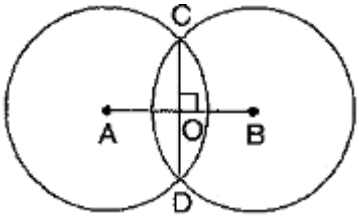
(b) Point B is in interior of the circle.

(c) Point C is in the exterior of the circle.



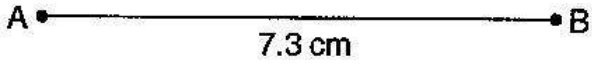
5. Draw two circles of equal radii taking A and B as their centre such that one of them passes through the centre of the other. They intersect at C and D. Join AB and CD.

Yes, AB and CD intersect at right angle as $\angle COB$ is 90°.



Ex 14.2 Answers

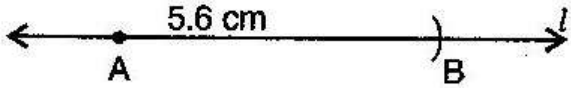
1. **Steps of construction**:



(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.

$\overline{AB}$ is the required line segment of length 7.3 cm.

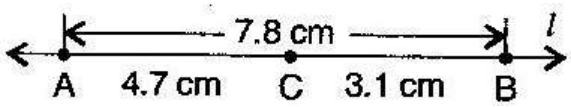
2. **Steps of construction**:



(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.

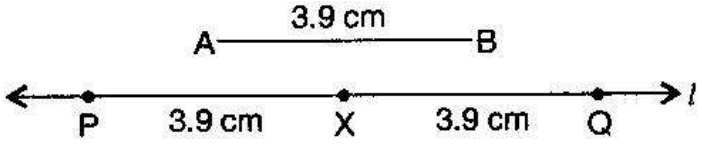
$\overline{AB}$ is the required line segment of length 5.6 cm.

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.
(iv) By measuring $\overline{BC}$, we find that BC = 3.1 cm

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:

By measurement we find that PQ = 7.8 cm

= 3.9 cm + 3.9 cm = $\overline{AB}$ + $\overline{AB}$ = 2 x $\overline{AB}$

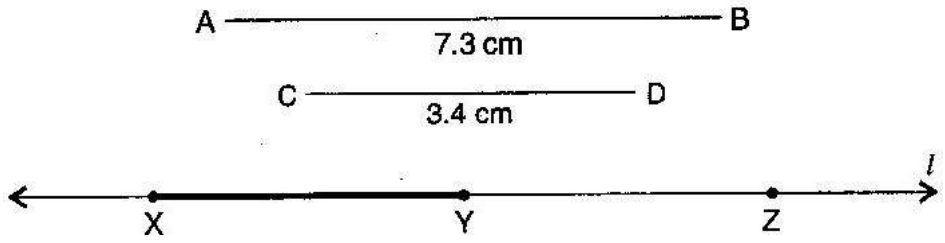
5. **Steps of construction**:

(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:

By measurement we find that length of $\overline{XY}$ = 3.9 cm

= 73. Cm – 3.4 cm = $\overline{AB} - \overline{CD}$

Class –VI Mathematics (Ex. 14.3)

Answers

1. **Steps of construction**:

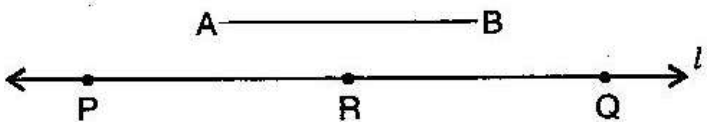
(i) Given $\overline{PQ}$ whose length is not known.

(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. Now $\overline{AB}$ is a copy of $\overline{PQ}$.

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.

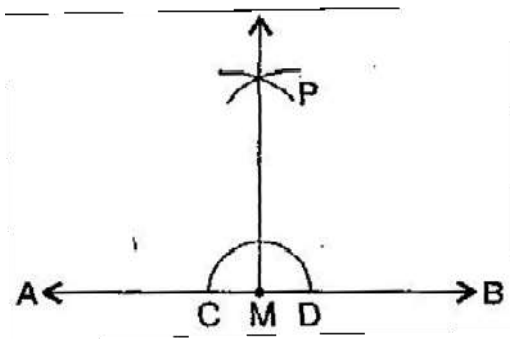
(v) Now place the pointer on R and without changing the compasses setting, draw another arc that cuts 'l' at a point Q.

(vi) Thus $\overline{PQ}$ is the required line segment whose length is twice that of AB

Class –VI Mathematics (Ex. 14.4)

Answers

1. **Steps of construction**:

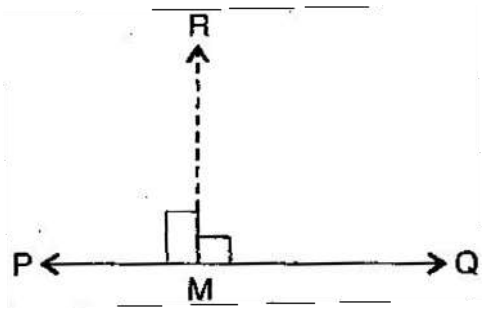


(i) With M as centre and a convenient radius, draw an arc intersecting the line AB at two points C and B.

(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.

2. **Steps of construction**:



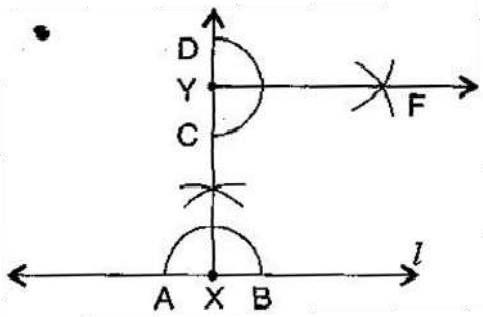
(i) Place a set-square on PQ such that one arm of its right angle aligns along PQ.

(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 PQ at M. Then RM $\perp$ PQ.

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.

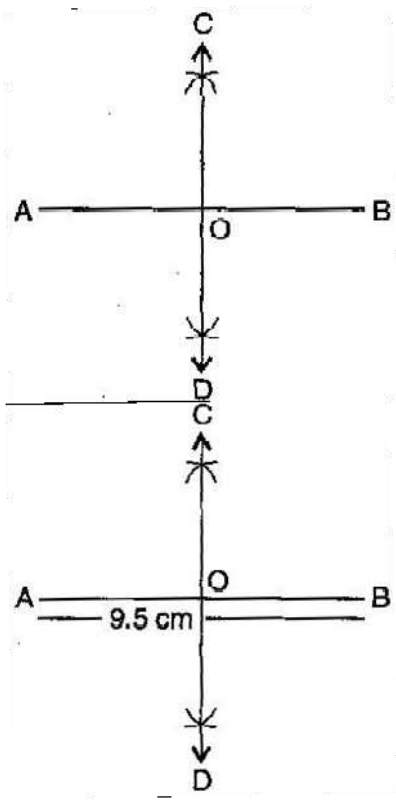
(vi) With C and D as centres and radius greater than YD, draw two arcs which cut each other at F.

(vii) Join YF, then YF is perpendicular to XY at Y.

Class –VI Mathematics (Ex. 14.5)

Answers

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.

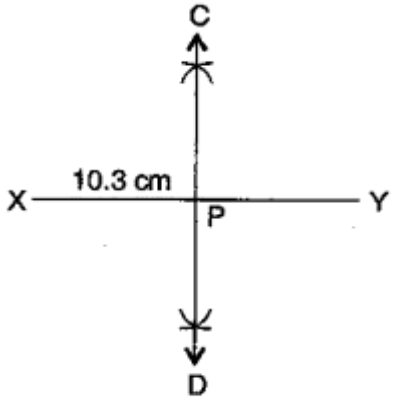
2. **Steps of construction**:

(i) Draw a line segment $\overline{AB}$ = 9.5 cm

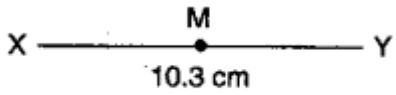
(ii) Taking A and B as centres and radius more than half of AB, draw two arcs which intersect each other at C and D.

(iii) Join CD. Then CD is the perpendicular bisector of $\overline{AB}$.

3. **Steps of construction**:



(i)



(ii)

(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.

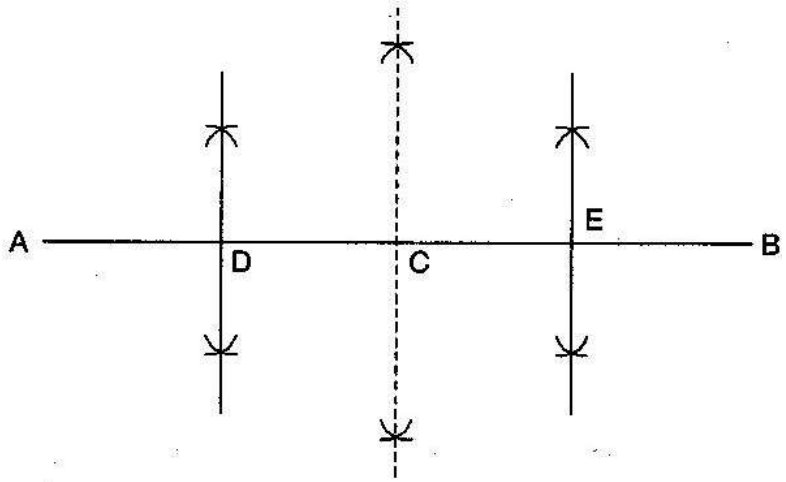
(iii) Join CD. Then CD is the required perpendicular bisector of $\overline{XY}$.

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 $\overline{MX} = \frac{1}{2}\overline{XY}$.

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 .

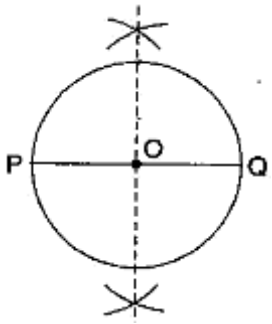
(iv) Again, draw the perpendicular bisector of $\overline{CB}$ which cuts it at E. Thus, E is the mid-point of $\overline{CB}$.

(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

5. **Steps of construction**:

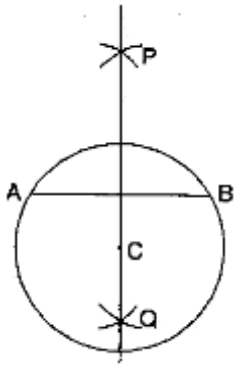


(i) Draw a line segment $\overline{PQ}$ = 6.1 cm.

(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 $\overline{PQ}$.

6. **Steps of construction**:



(i) Draw a circle with centre C and radius 3.4 cm.

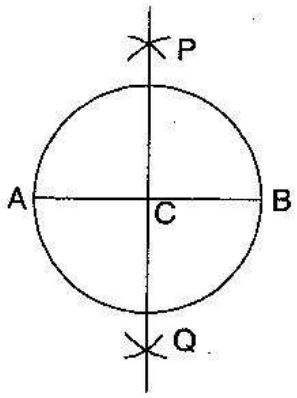
(ii) Draw any chord $\overline{AB}$.

(iii) Taking A and B as centers 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.

7. **Steps of construction**:



(i) Draw a circle with centre C and radius 3.4 cm.

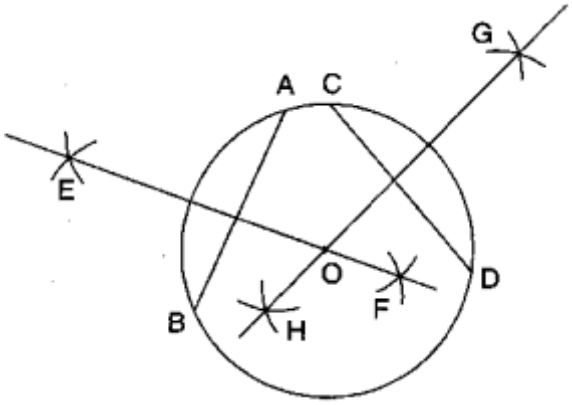
(ii) Draw its diameter $\overline{AB}$.

(iii) Taking A and B as centers 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.

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.

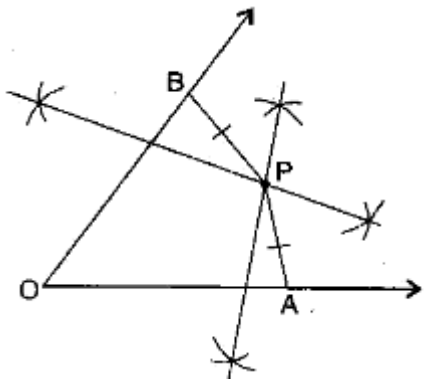
(iii) Taking A and B as centers and radius more than half AB, draw two arcs which intersect each other at E and F.

(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.

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 $\overline{OB}$.

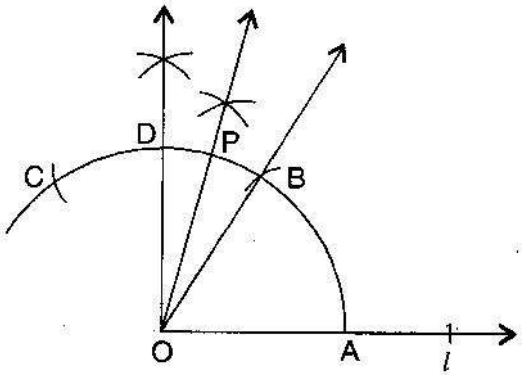
(iv) Let them meet at P. Join PA and PB.

(v) With the help of divider, we check that $\overline{PA} = \overline{PB}$.

Class –VI Mathematics (Ex. 14.6)

Answers

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.

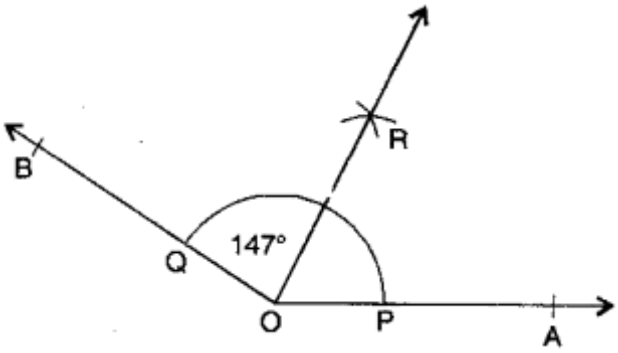
(d) Join OB, then $\angle BOA = 60°$.

(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, $\angle POA = 75°$

2. **Steps of construction**:



(a) Draw a ray 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.

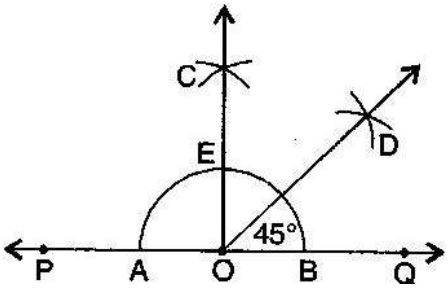
(d) Taking P as centre and radius more than half of PQ, draw an arc.

(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.

Thus, $\overline{OR}$ is the required bisector of $\angle AOB$.

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.

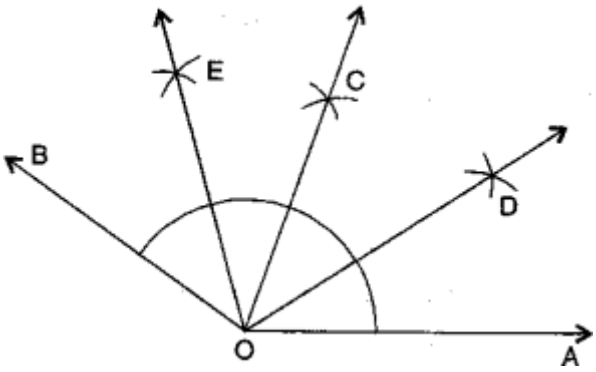
(c) Taking A and B as centers and radius more than half of AB, draw two arcs which intersect each other at C.

(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 $\angle COQ$.

4. **Steps of construction**:



(a) Draw a ray OA.

(b) At O, with the help of a protractor, construct $\angle AOB = 153°$.

(c) Draw $\overline{OC}$ as the bisector of $\angle AOB$.

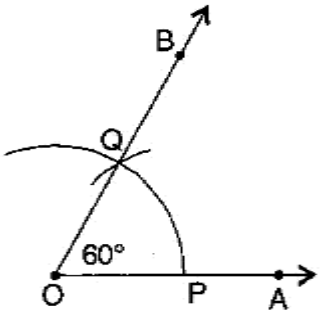
(d) Again, draw $\overline{OD}$ as bisector of $\angle AOC$.

(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.

5. **Steps of construction**:

(a) 60°



(i) Draw a ray OA.

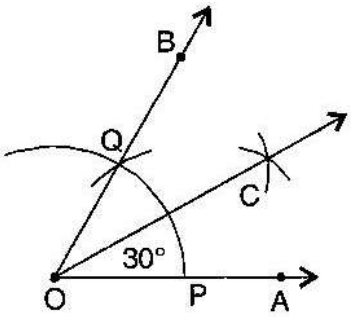
(ii) Taking O as centre and convenient radius, mark an arc, which intersects OA at P.

(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 OA.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects OA at P.

(iii) Taking P as centre and same radius, cut previous arc at Q.

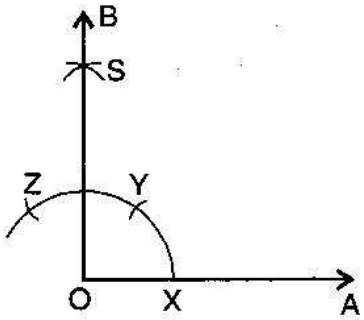
(iv) Join OQ. Thus, $\angle BOA$ is required angle of 60°.

(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 OA.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects OA at X.

(iii) Taking X as centre and same radius, cut previous arc at Y.

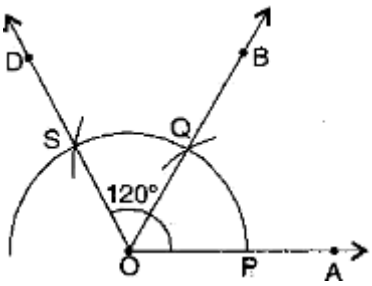
(iv) Taking Y as centre and same radius, draw another arc intersecting the same arc at Z.

(v) Taking Y and Z as centers 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 OA.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects OA at P.

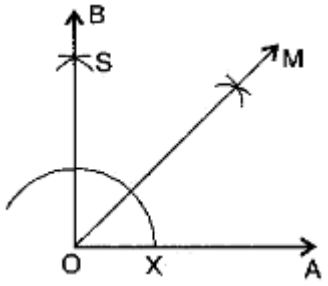
(iii) Taking P as centre and same radius, cut previous arc at Q.

(iv) Taking Q as centre and same radius cut the arc at S.

(v) Join OS.

Thus, $\angle AOD$ is required angle of 120°.

(e) 45°



(i) Draw a ray OA.

(ii) Taking O as centre and convenient radius, mark an arc, which intersects 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.

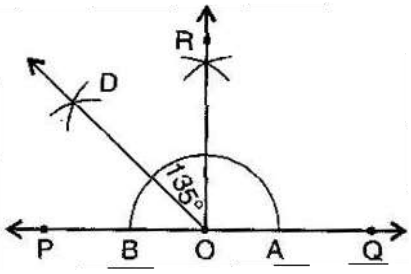
(v) Taking Y and Z as centers and same radius, draw two arcs intersecting each other at S.

(vi) Join OS and produce it to form a ray OB. Thus, $\angle BOA$ is required angle of 90°.

(vii) Draw the bisector of $\angle BOA$.

Thus, $\angle MOA$ 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.

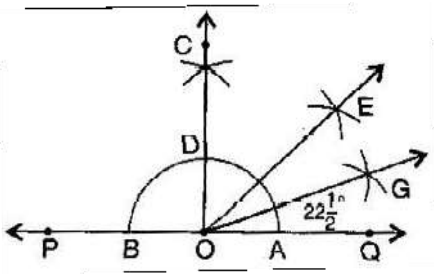
(iii) Taking A and B as centers and radius more than half of AB, draw two arcs intersecting each other at R.

(iv) Join OR. Thus, $\angle QOR = \angle POQ = 90^\circ$.

(v) Draw OD the bisector of $\angle POR$.

Thus, $\angle QOD$ is required angle of 135°.

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 centers and radius more than half of

AB, draw two arcs which intersect each other at C.

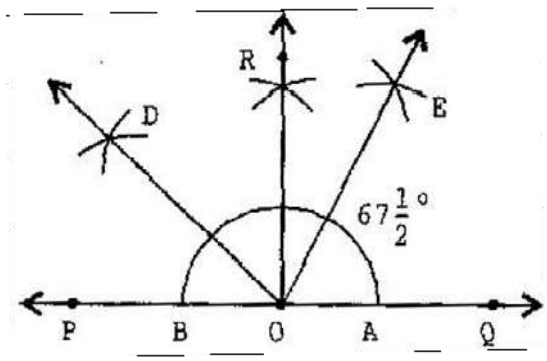
(d) Join OC. Then $\angle COQ$ is an angle of 90°

(e) Draw OE as the bisector of $\angle COE$. Thus, $\angle QOE = 45^\circ$

(f) Again draw OG as the bisector of $\angle QOE$.

Thus, $\angle QOG = \angle EOG = 22\frac{1}{2}^\circ$.

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 centers and radius more than half of AB, draw two arcs intersecting each other at R.

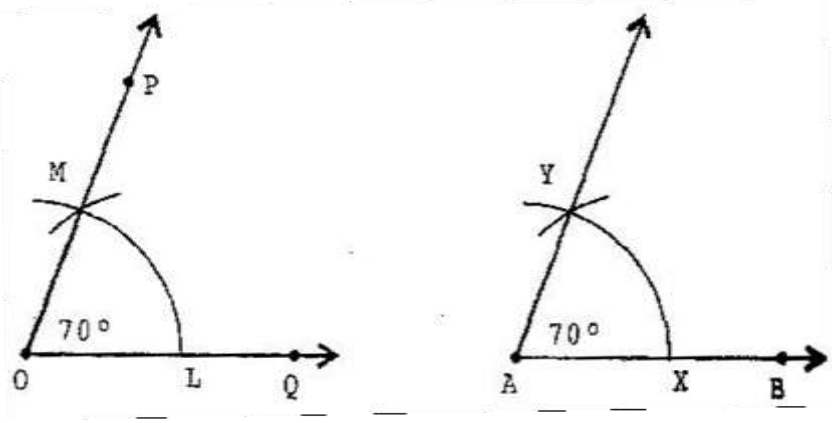
(d) Join OR. Thus, $\angle QOR = \angle POQ = 90^\circ$.

(e) Draw OD the bisector of $\angle POR$. Thus, $\angle QOD$ is required angle of 135°.

(f) Now, draw OE as the bisector of $\angle QOD$.

Thus, $\angle QOE = \angle DOE = 67\frac{1}{2}^\circ$

8. **Steps of construction**:



(a) Draw an angle 70° with protractor, i.e., $\angle POQ = 70^\circ$

(b) Draw a ray AB.

(c) Place the compasses at O and draw an arc to cut the rays of $\angle POQ$ at L and M.

(d) Use the same compasses, setting to draw an arc with A as centre, cutting AB at X.

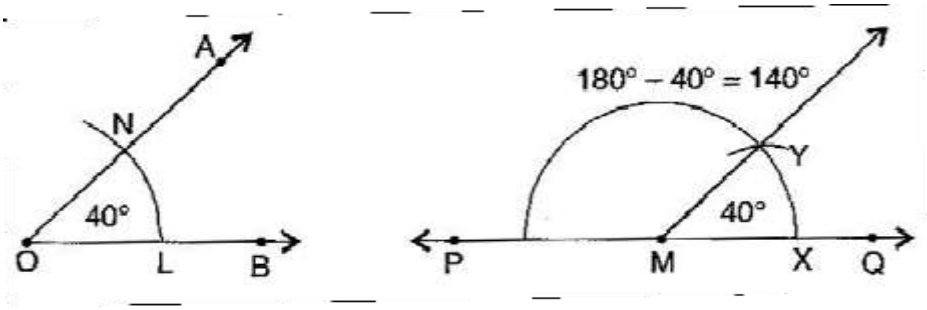
(e) Set your compasses setting to the length LM with the same radius.

(f) Place the compasses pointer at X and draw the arc to cut the arc drawn earlier at Y.

(g) Join AY.

Thus, $\angle YAX = 70^\circ$

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.
(i) Thus, $\angle$QMY = $40°$ and $\angle$PMY is supplementary of it.

Chapter 14 : Practical Geometry

MIND MAP

TYPE:1

Q1. Draw a circle of radius 4.1 cm.

Q2. Draw a circle of diameter 7 cm.

Q3. With AB of length 5.4 cm as a diameter, draw a circle.

TYPE: 2

Q1. Draw a line segment of length 4.5 cm using ruler and compasses.

Q1. Draw a line l and a point X on it. Through X, draw a line segment XY perpendicular to l.

Q2. Draw a line segment of length 8.4 cm and construct its perpendicular bisector.

TYPE: 3

Q1. Draw a line segment of length 6 cm and draw its axis of symmetry.

Q2. Draw the perpendicular bisector of a line segment of length 9.2 cm.

Q3. Draw an angle of measure 60˚ and divide it into four equal parts.

Q4. Construct an right angle and bisect it.

TYPE: 4

Q1. Construct the angles 30˚, 45˚, 60˚, 90˚ and 120˚ with ruler and compasses.

ACHIEVER'S SECTION (HOTS)

Q1. Construct an angle of 75 using ruler and compasses and bisect it.

Q2. Using protractor draw each of the following angles:

(a) 75˚ (b) 130˚ (c) 165˚ (d) 85˚.

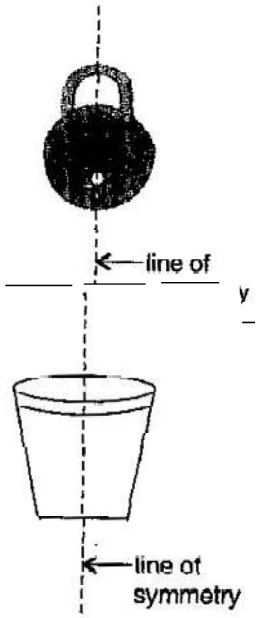
Q3. Construct an equilateral triangle of any side length.

Q4. Draw two concentric circles with radius 3.2 cm and 4.1 cm.

Class 6 Ch 13. Symmetry

Class –VI Mathematics (Ex. 13.1)
Answers

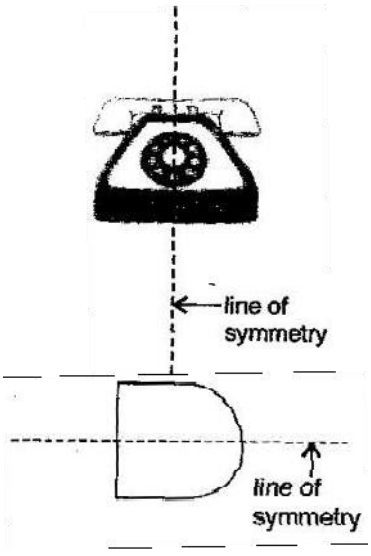
1. Notebook, Blackboard, Glass, Inkpot.
2. l_2 is the mirror line as both sides of the lines are symmetric.
3. (a) Symmetric



(b) Symmetric

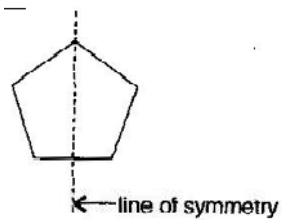
(c) Not symmetric

(d) Symmetric

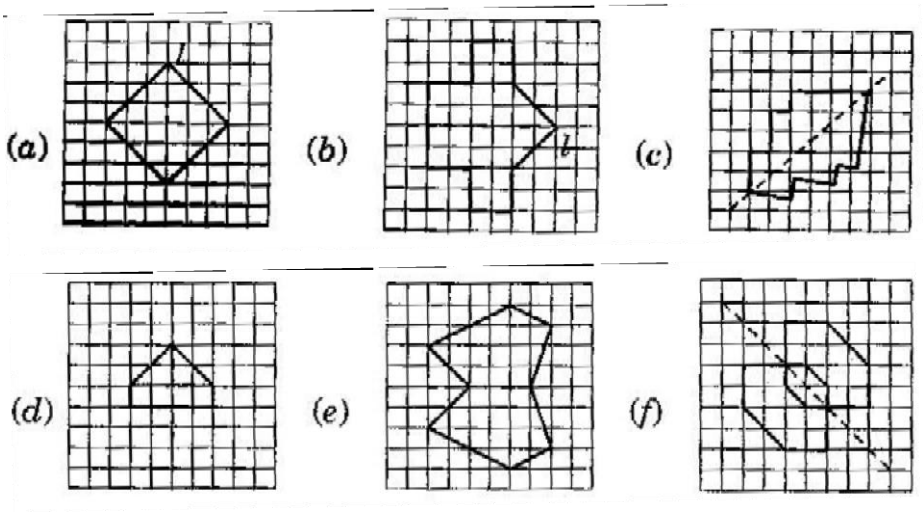


(e) Symmetric

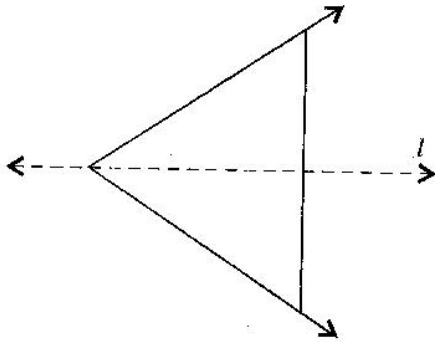
(f) Symmetric



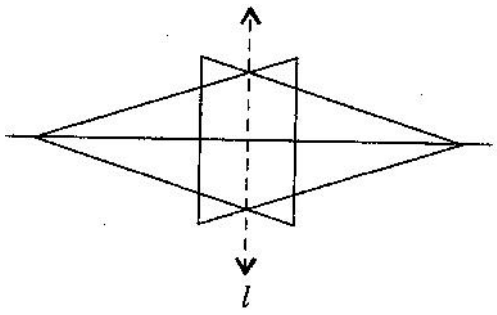
4. Sol.



5. Sol.



6. Sol.

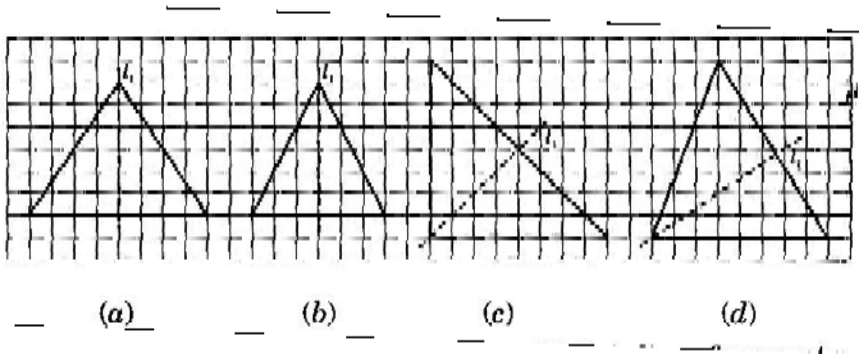


Class –VI Mathematics (Ex. 13.2)

Answers

1. (a) 4 (b) 4 (c) 4 (d) 1 (e) 6 (f) 4
   (g) 0 (h) 0 (i) 3

2. Sol.



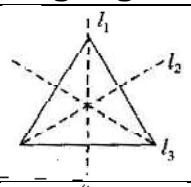
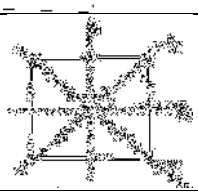
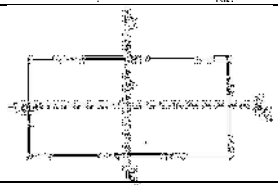
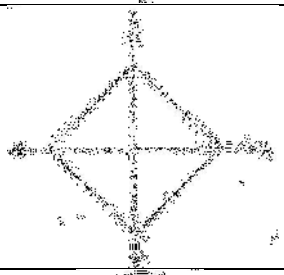
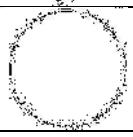
(a) l_1 is the line of symmetry.

(b) l_1 is the line of symmetry.

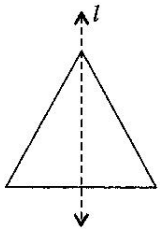
(c) l_1 is the line of symmetry.

(d) No line of symmetry.

3. Sol.

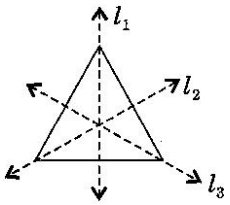
Shape	Rough figure	No. of lines of symmetry
Equilateral triangle		3
Square		4
Rectangle		2
Isosceles triangle		1
Rhombus		2
Circle		Infinite

4. (a) Yes, Isosceles triangle

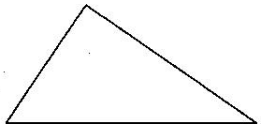


(b) No such triangle cannot be formed.

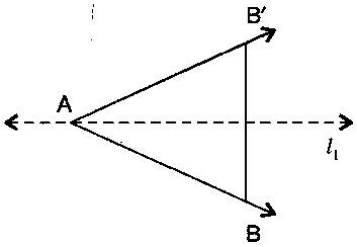
(c) Yes, Equilateral triangle



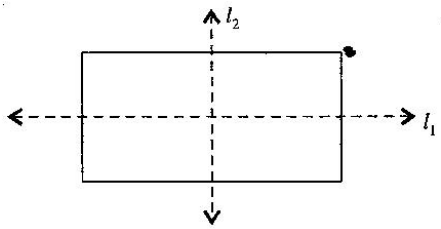
(d) Yes, Scalene triangle



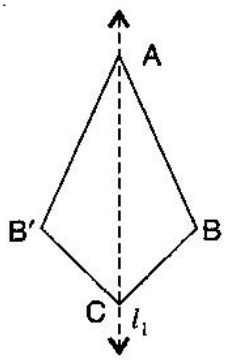
5. (a)



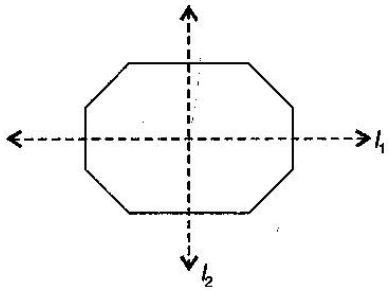
(b)



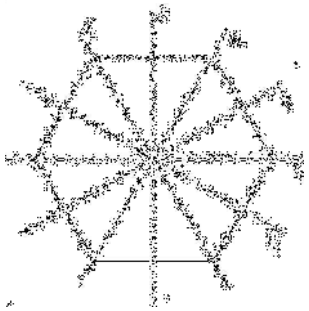
(c)



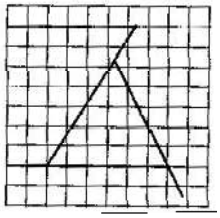
(d)



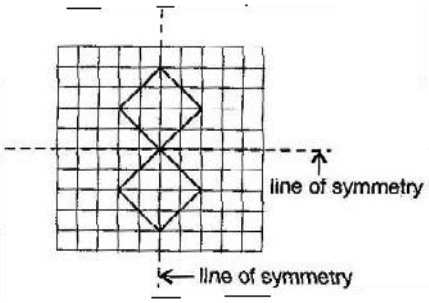
(e)



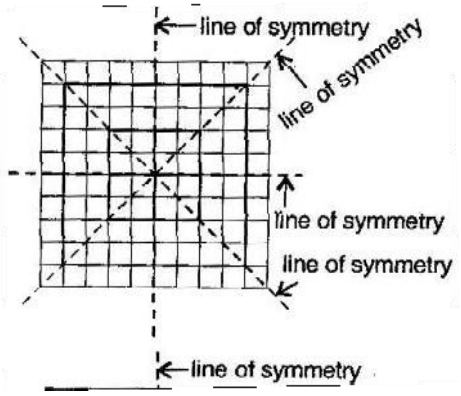
6. (a) No line



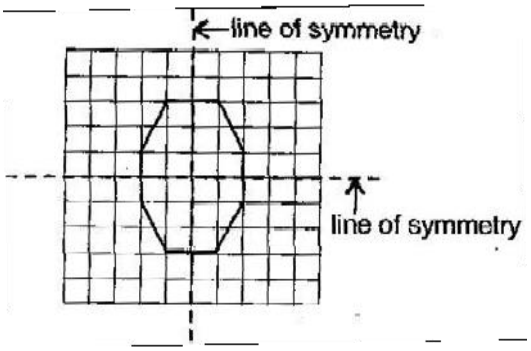
(b) Two lines



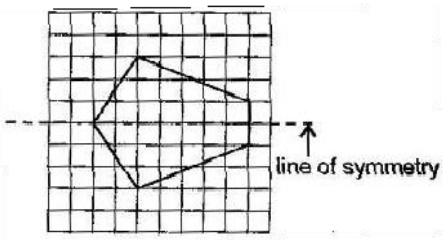
(c) Four lines



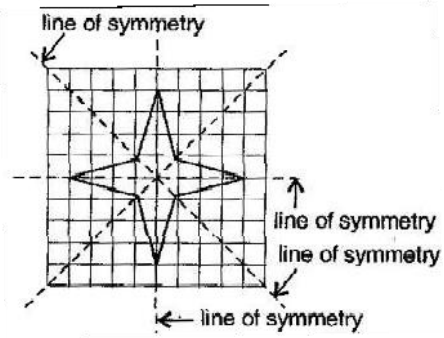
(d) Two lines



(e) One line

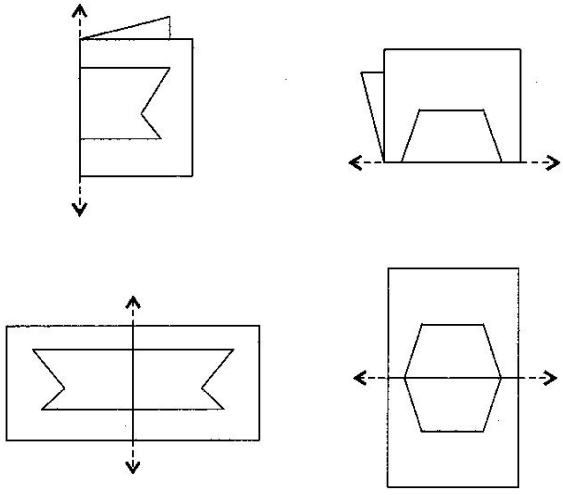


(f)



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, I, N, P, Q, R, S, Z

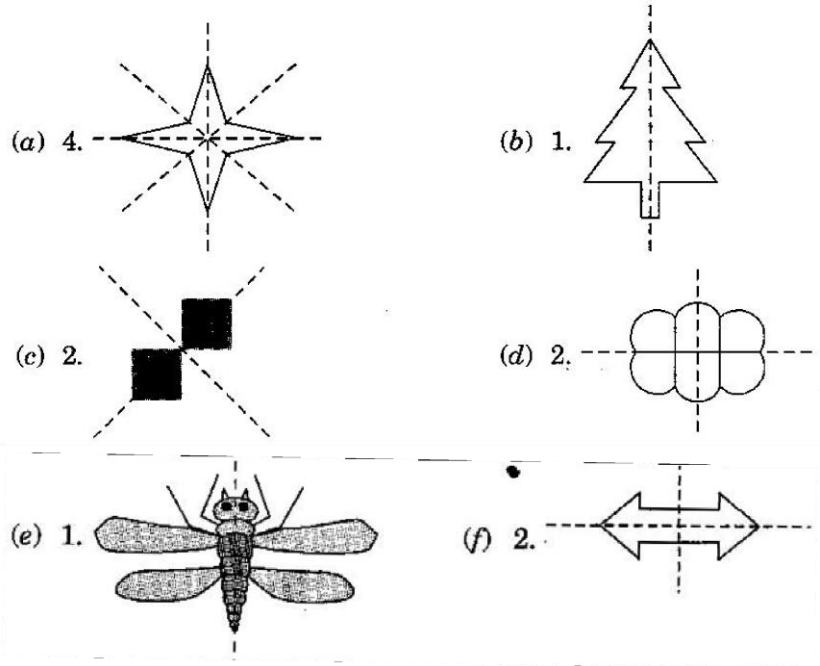
8. Sol.



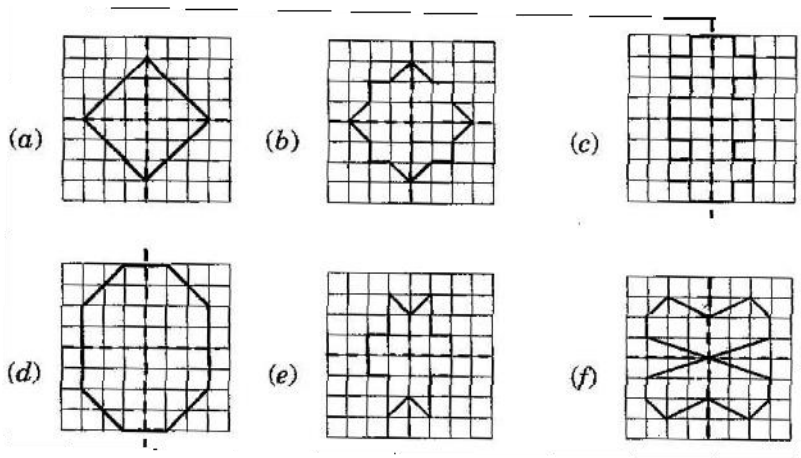
Class –VI Mathematics (Ex. 13.3)

Answers

1. Sol.

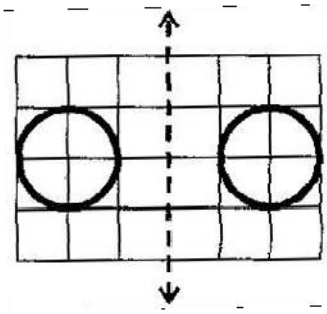


2. Sol.

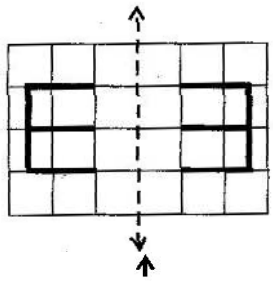


3.

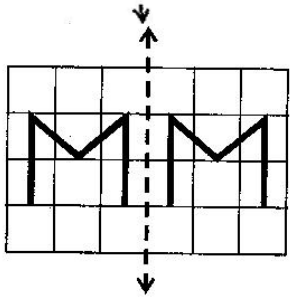
Same after reflection



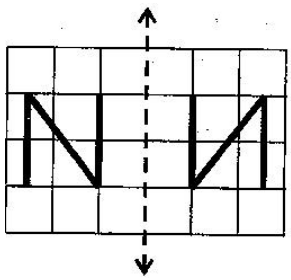
Different after reflection



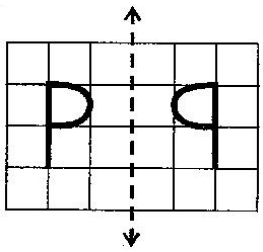
Same after reflection



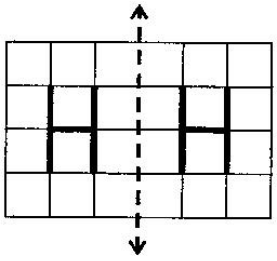
Different after reflection



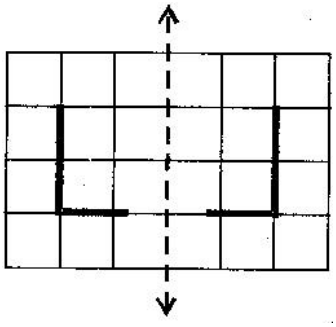
Different after reflection



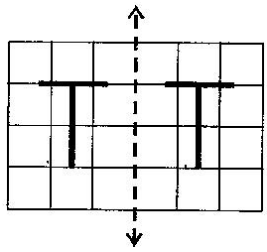
Same after reflection



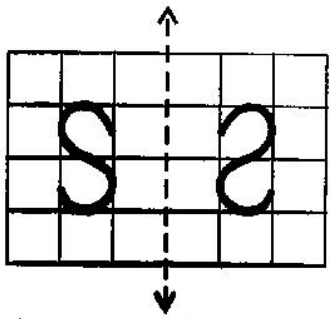
Different after reflection



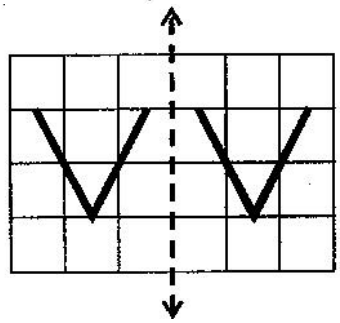
Same after reflection



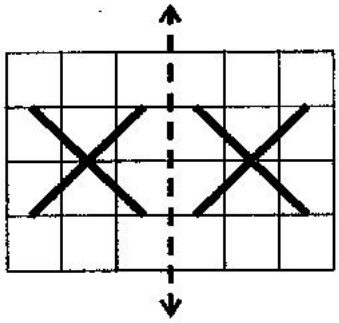
Different after reflection



Same after reflection



Same after reflection

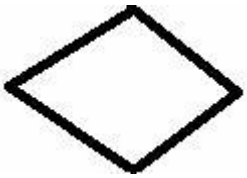


Chapter 13 : Symmetry

MIND MAP

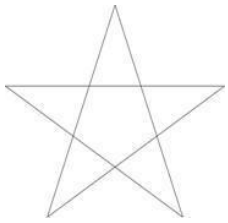
Q 1 Indicate the line of symmetry in the following figure.

Q 2 Draw the mirror image of the following:

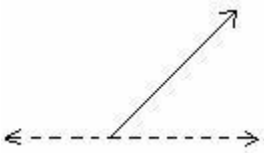


Q 3 Give any two examples of symmetrical objects from the everyday life.

Q 4 Check whether the given figure is symmetrical or not?

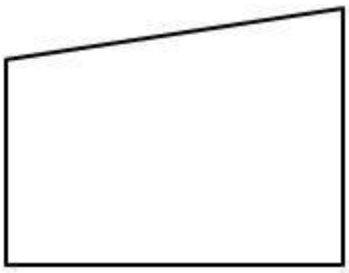


Q 5 Complete the following figure such that the dotted line is the line of symmetry.



Q 6 Name the line that divides the figure into two identical halves.

Q 7 How many lines of symmetry does the following figure have?



Q 8 True or False: A figure can have only one line of symmetry.

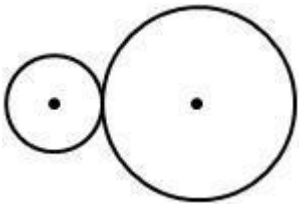
Q 9 Identify the number of line of symmetry in the following figure.

Q 12 When a figure is said to have a line symmetry?

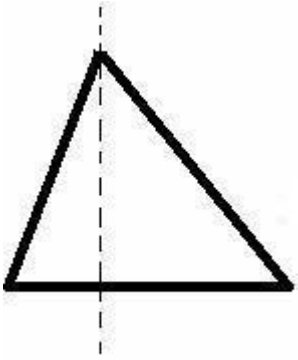
Q 13 Draw a figure whose mirror image is identical to the figure itself.

Q 14 Is the following figure symmetrical?

Q 15 Draw a line of symmetry for the following figure.



Q 16 Give some of the applications of symmetry in everyday life.



Class 6 Ch 12. Ratio & Proportion

Class –VI Mathematics (Ex. 12.1)
Answers

1. (a) The ratio of girls to that of boys = $\frac{20}{15} = \frac{4}{3} = 4 : 3$

   (c) The ratio of girls to total students = $\frac{20}{20+15} = \frac{20}{35} = \frac{4}{7} = 4 : 7$

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 = $\frac{12}{30} = \frac{2}{5} = 2 : 5$

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 = $\frac{2}{7} = 2 : 7$

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 = $\frac{9}{12} = \frac{3}{4} = 3 : 4$

5. $\frac{15}{18} = \frac{\boxed{5}}{6} = \frac{10}{\boxed{12}} = \frac{\boxed{25}}{30}$

   Yes, these are equivalent ratios.

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

7. (a) 30 minutes to 1.5 hour

1.5 hours = 1.5 x 60 = 90 minutes [$\because$ 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 [$\because$ 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

Re. 1 = 100 paise

Now, ratio of 55 paise to Re. 1 = 55 paise : 100 paise

$\Rightarrow$ $\frac{\cancel{55}}{\cancel{100}} = \frac{11}{20}$ = 11 : 20

(d) 500 ml to 2 liters

2 liters = 2 x 1000 ml = 2000 ml [$\because$ 1 litre = 1000 ml]

Now, ratio of 500 ml to 2 liters = 500 ml : 2 liters

$\Rightarrow$ 500 ml : 2000 ml = $\frac{\cancel{500}}{\cancel{2000}} = \frac{1}{4}$ = 1 : 4

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

9. Ratio of number of teachers to that of students = $\frac{\cancel{102}}{\cancel{3300}} = \frac{17}{550}$ = 17 : 550

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

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

12. Cost of a dozen pens (12 pens) = ` 180

    ∴ Cost of 1 pen = $\frac{180}{12}$ = ` 15

    Cost of 8 ball pens = ` 56

    ∴ Cost of 1 ball en = $\frac{56}{8}$ = ` 7

    Ratio of cost of one pen to that of one ball pen = $\frac{15}{7}$ = 15 : 7

13. Ratio of breadth to length = 2 : 5 = $\frac{2}{5}$

    ∴ 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

14. Ratio between Sheela and Sangeeta = 3 : 2

Total these terms = 3 + 2 = 5

Therefore, part of Sheela = $\frac{3}{5}$ of the total pens

And 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

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

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

Class –VI Mathematics (Ex. 12.2)

Answers

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.

2. (a) 16 : 25 : : 20 : 30 $\Rightarrow \frac{\cancel{16}}{\cancel{24}} = \frac{\cancel{20}}{\cancel{30}} \Rightarrow \frac{2}{3} = \frac{2}{3}$

Hence, it is True.

(b) 21 : 6 : : 35 : 10 $\Rightarrow \frac{\cancel{21}}{\cancel{6}} = \frac{\cancel{35}}{\cancel{10}} \Rightarrow \frac{7}{2} = \frac{7}{2}$

Hence, it is True.

(c) 12 : 18 : : 28 : 12 $\Rightarrow \frac{\cancel{12}}{\cancel{18}} = \frac{\cancel{28}}{\cancel{12}} \Rightarrow \frac{2}{3} \neq \frac{7}{3}$

Hence, it is False.

(d) 8 : 9 : : 24 : 27 $\Rightarrow \frac{\cancel{8}}{\cancel{9}} = \frac{\cancel{24}}{\cancel{27}} \Rightarrow \frac{8}{9} = \frac{8}{9}$

Hence, it is True.

(e) 5.2 : 3.9 : : 3 : 4 $\Rightarrow \frac{\cancel{5.2}}{\cancel{3.9}} = \frac{\cancel{3}}{\cancel{4}} \Rightarrow \frac{4}{3} \neq \frac{3}{4}$

Hence, it is False.

(f) 0.9 : 0.36 : : 10 : 4 $\Rightarrow \frac{\cancel{0.9}}{\cancel{0.36}} = \frac{\cancel{10}}{\cancel{4}} \Rightarrow \frac{5}{2} = \frac{5}{2}$

Hence, it is True.

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 liters : 15 liters = $\frac{7.5}{15} = \frac{\cancel{75}}{\cancel{150}} = \frac{1}{2}$ = 1 : 2

5 kg : 10 kg = $\frac{\cancel{5}}{\cancel{10}} = \frac{1}{2}$ = 1 : 2

Since, 7.5 liters : 15 liters = 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 = $\frac{32}{64} = \frac{1}{2}$ = 1 : 2

6 sec : 12 sec = $\frac{6}{12} = \frac{1}{2}$ = 1 : 2

Since, 32 m : 64 m = 6 sec : 12 sec

Hence, the statement is true.

(e) 45 km : 60 km = $\frac{45}{60} = \frac{3}{4}$ = 3 : 4

12 hours : 15 hours = $\frac{12}{15} = \frac{4}{5}$ = 4 : 5

Since, 45 km : 60 km $\neq$ 12 hours : 15 hours

Hence, the statement is true.

4. (a) 25 cm : 1 m = 25 cm : (1 x 100) cm = 25 cm : 100 cm = $\frac{25}{100} = \frac{1}{4}$ = 1 : 4

` 40 : ` 160 = $\frac{40}{160} = \frac{1}{4}$ = 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 liters : 65 liters = $\frac{39}{65} = \frac{3}{5}$

6 bottles : 10 bottles = $\frac{6}{10} = \frac{3}{5}$ = 3 : 5

Since the ratios are equal, therefore these are in proportion.

Middle terms = 65 liters, 6 bottles and Extreme terms = 39 liters, 10 bottles

(c) 2 kg : 80 kg = $\frac{2}{80} = \frac{1}{40}$ = 1 : 40

25 g : 625 g = $\frac{25}{625} = \frac{1}{25}$ = 1 : 25

Since the ratios are not equal, therefore these are not in proportion.

(d) 200 ml : 2.5 liters = 200 ml : (25 x 1000) liters = 200 ml : 2500 ml = $\frac{200}{2500} = \frac{2}{25}$ = 2 : 25

` 4 : ` 50 = $\frac{4}{50} = \frac{2}{25}$ = 2 : 25

Since the ratios are equal, therefore these are in proportion.

Middle terms = 2.5 liters, ` 4 and Extreme terms = 200 ml, ` 50

Class –VI Mathematics (Ex. 12.3)

Answers

1. Cost of 7 m of cloth = ` 294

   ∴ Cost of 1 m of cloth = $\frac{294}{7}$ = ` 42

   ∴ Cost of 5 m of cloth = 42 x 5 = ` 210

   Thus, the cost of 5 m of cloth is ` 210.

2. Earning of 10 days = ` 1500

   ∴ Earning of 1 day = $\frac{1500}{10}$ = ` 150

   ∴ Earning of 30 days = 150 x 30 = ` 4500

   Thus, the earning of 30 days is ` 4,500.

3. Rain in 3 days = 276 mm

   ∴ Rain in 1 day = $\frac{276}{3}$ = 92 mm

   ∴ Rain in 7 days = 92 x 7 = 644 mm

   Thus, the rain in 7 days is 644 mm.

4. (a) Cost of 5 kg of wheat = ` 30.50

   ∴ Cost of 1 kg of wheat = $\frac{30.50}{5} = \frac{3050}{500}$ = ` 6.10

   ∴ Cost of 8 kg of wheat = 6.10 x 8 = ` 48.80

   (b) From ` 30.50, quantity of wheat can be purchased = 5 kg

   ∴ From ` 1, quantity of wheat can be purchased = $\frac{5}{30.50}$

   ∴ From ` 61, quantity of wheat can be purchased = $\frac{5}{30.50} \times 61 = \frac{5}{3050} \times 6100$ = 10 kg

5. Degree of temperature dropped in last 30 days = 15 degrees

   ∴ Degree of temperature dropped in last 30 days = $\frac{15}{30} = \frac{1}{2}$ degree

   ∴ Degree of temperature dropped in last 10 days = $\frac{1}{2} \times 10$ = 5 degree

   Thus, 5 degree Celsius temperature dropped in 10 days.

6. Rent paid for 3 months = ` 7500

   ∴ Rent paid for 1 months = $\frac{7500}{3}$ = ` 2500

   ∴ Rent paid for 12 months = 2500 x 12 = ` 30,000

Thus, the total rent of one year is ` 30,000.

7. Cost of 4 dozen bananas = ` 60

   Cost of 48 bananas = ` 60 [4 dozen = 4 x 12 = 48]

   ∵ From ` 60, number of bananas can be purchased = 48

   ∴ From ` 1, number of bananas can be purchased = $\frac{\cancel{48}}{\cancel{60}} = \frac{4}{5}$

   ∴ From ` 12.50. number of bananas can be purchased = $\frac{4}{5} \times 12.50 = \frac{\cancel{4}}{\cancel{5}} \times \frac{\cancel{1250}}{\cancel{100}} = \frac{\cancel{250}}{\cancel{25}}$

   = 10 bananas

   Thus, 10 bananas can be purchased for ` 12.50.

8. The weight of 72 books = 9 kg

   ∴ The weight of 1 book = $\frac{\cancel{9}}{\cancel{72}} = \frac{1}{8}$

   ∴ The weight of 40 books = $\frac{1}{\cancel{8}} \times \cancel{40}$ = 5 kg

   Thus, the weight of 40 books is 5 kg.

9. For covering 594 km, a truck will be required diesel = 108 liters

   ∴ For covering 1 km, a truck will be required diesel = $\frac{\cancel{108}}{\cancel{594}} = \frac{2}{11}$

   ∴ For covering 1650 km, a truck will be required diesel = $\frac{2}{\cancel{11}} \times \cancel{1650}$ = 300 liters

   Thus, 300 liters diesel will be required by the truck to cover a distance of 1650 km.

10. Raju purchase 10 pens for = ` 150

    ∴ Raju purchases 1 pen for = $\frac{\cancel{150}}{\cancel{10}}$ = ` 15

    Manish purchases 7 pens for = ` 84

    ∴ Manish purchases 1 pen for = $\frac{\cancel{84}}{\cancel{7}}$ = ` 12

    Thus, Manish got the pens cheaper.

11. Anish made in 6 overs = 42 runs

    ∴ Anish made in 1 overs = $\frac{\cancel{42}}{\cancel{6}}$ = 7 runs

    Anup made in 7 overs = 63 runs

    ∴ Anup made in 1 overs = $\frac{\cancel{63}}{\cancel{7}}$ = 9 runs

    Thus, Anup made more runs per over.

Chapter 12 : Ratio and Proportion

MIND MAP

TYPE: 1

Q1. Find the ratio of 12 min to 3 hours.

Q2. Length and breadth of a rectangular field are 30 m and 120 cm respectively. Find the ratio of the length to the breadth of the field.

Q3. There are 10 girls and 30 boys in a class. Find the ratio of

(a) Number of boys to the number of girls.

(b) Number of girls to the total number of students.

TYPE: 2

Q1. Divide ₹ 60 in the ratio 1:2 between kirti and Anuja.

Q2. Write three equivalent ratios of 3:5.

TYPE: 3

Q1. Are 30, 40, 45 and 60 in proportion?

Q2. Determine if 3 kg: 30 g and 30 kg: 625 g form a proportion. Also, write the middle terms and extreme terms where the ratios form a proportion.

TYPE: 4

Q1. Cost of 105 envelopes is ₹ 35. How many envelopes can be purchased for ₹ 10?

Q2. A motorbike can travel 220 Km in 5 litres of petrol. How much distance will it cover in 1.5 litres of petrol.

ACHIEVER'S SECTION (HOTS)

Q1. Devendra wants to divide ₹ 300between his two sons Amit and Nitin in the ratio of their ages. If the age of Amit is 12 years and that of Nitin os 8 years, find the share of each.

Q2. Cost of 3 mathematics book is ₹ 270 and the cost of 5 English books is ₹ 225. Find the ratio of the cost of one mathematics book to the cost of one English book.

Q3. Find the second term of a proportion whose 1^{st}, 3^{rd} and 4^{th} terms are 54, 90 and 45.

Q4. The shares of profit of A and B are in ratio 4:3. If the share of B is ₹ 42600, find the total profit.

Q5. The rent of a room for 3 months is ₹ 7500. What is the rent of the room for a year?

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

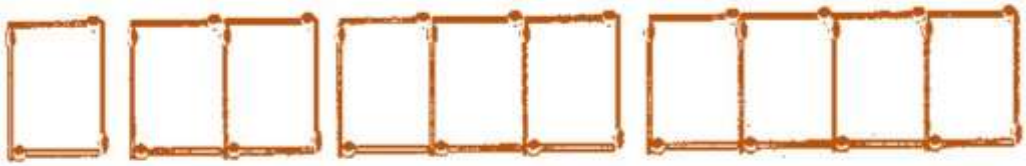
Therefore, total number of oranges in boxes = $2x$

Remaining oranges = 10

Thus, number of oranges = $2x+10$

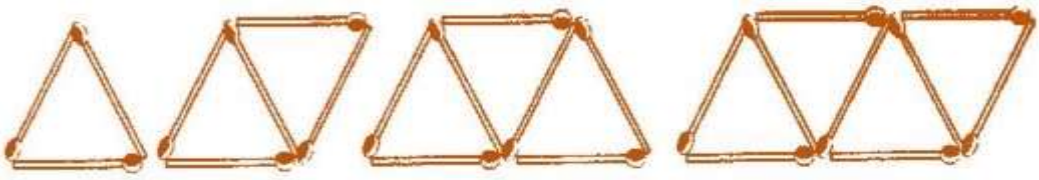
Question 11:

(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)

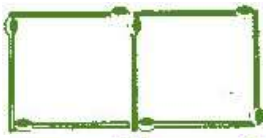
(b) Figs. Below gives a matchstick pattern of triangles. As in Exercise 11 (a) above find the general rule that gives the number of matchsticks in terms of the number of triangles.



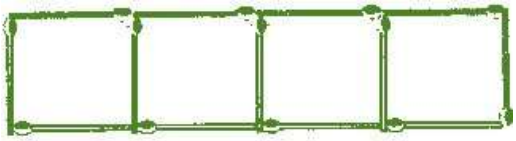
(a) (b) (c) (d)

Answer 11:

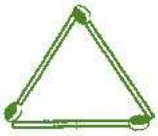
(a)  4 matchsticks

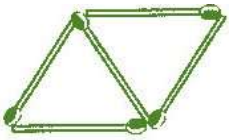
 7 matchsticks

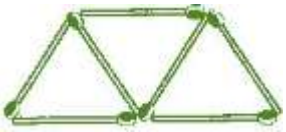
 10 matchsticks

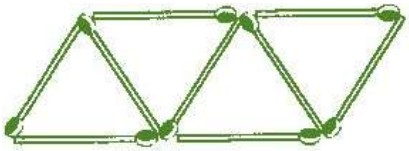
 13 matchsticks

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.

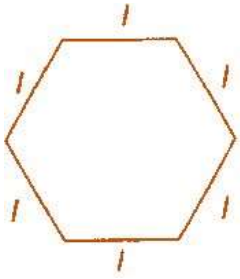
Answer 1:

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)



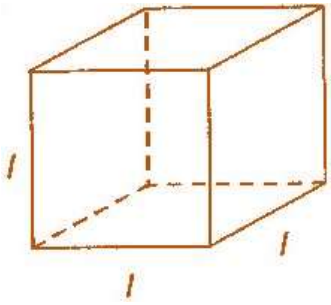
Answer 2:

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:

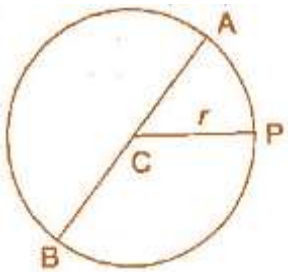
Length of one edge of cube = l

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.

$\because$ L.H.S. $=$ R.H.S.
$\therefore$ $p = 10$ is a solution.

5 – 5 = 0
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $p = 5$ is not the 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.

–4 – 4 = –8
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $r = -4$ is not the solution.

8 – 4 = 4
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $r = 8$ 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.

0 + 4 = 4
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $x = 0$ is not the solution.

2 + 4 = 6
$\because$ L.H.S. $\neq$ R.H.S.
$\therefore$ $x = 2$ 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.

Chapter 11 : Algebra

MIND MAP

TYPE: 1

Q.1. Find the rule which gives the number of matchsticks required to make the following matchstick pattern. Use variable x to write the rule.
(a) A pattern of letter N (b) A pattern of letter W.

Q.2 If there are 40 mangoes in a box, how will you write the total number of mangoes in term of the number of boxes? (Number of boxes are t)

Q.3 Mother has made laddu. She gives some laddus to guests and the family members: still 9 laddus remains. If the number of laddus mother gave away is r, how many laddus did she make?

TYPE: 2

Q.1. The side of an regular pentagon is shown by b. Express the perimeter of regular pentagon.

Q.2. A cube is a three-dimensional figure. It has six faces and all of them are are identical squares. The length of edge of cube is l. Find the formula for the total length of the edges of a cube.

TYPE: 3

Q.1. Identify the operations from the following expressions:

$$z + a, z - 4, \quad 2z, \quad z/3$$

Q.2. Convert the following statements into expressions:

(a) 9 subtracted from s (b) 7 added to x (c) -a divided by 3 (d) p multiplied by 4

Q.3. (e) 7 times x plus 9 (f) y multiplied by -4 and the result is added to19.

Q4. The length of a rectangle hall is 6 m less than 2 times the breadth of the hall. What is the length, if the breadth b metres?

ACHEIVER'S SECTION (HOTS)

Q1. The height of Anisha is 15 cm less than her sisters Reema. Taking height of Reema As x, express height of Anisha in terms of x.

Q2. The number of rooms on the ground floor of a building is 4 less than three times the number of rooms on the first floor. If the first floor has $y$rooms, how many rooms does the ground floor have?

Q3. The length of a rectangle is 4 m less than its breadth. What is its perimeter?

Q4. If a pen costs ₹ x and a pencil costs ₹ y, then what is the cost of 5 pens and 9 pencils together?

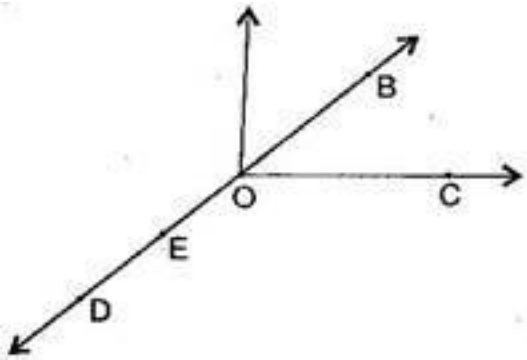
Q5. Write the product of three consecutive integers, of which the middle one is x.

Class –VI Mathematics

Chaper 4 Basic Geometrical Ideas

(Ex. 4.1)

Question 1. Use the figure to name:



(a) Five points

(b) A line

(c) Four rays

(d) Five line segments

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

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

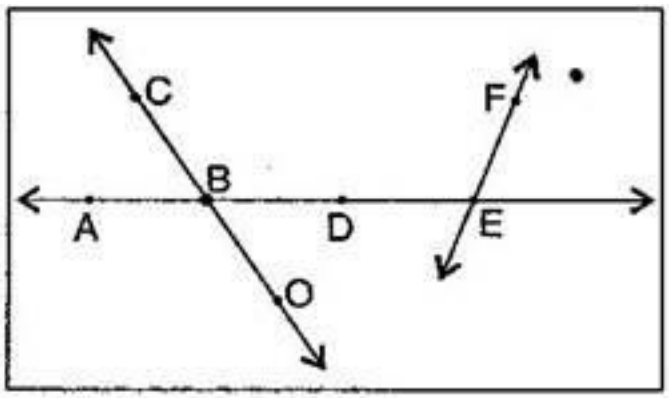
(c) Four rays: $\overrightarrow{OD}, \overrightarrow{OE}, \overrightarrow{OC}, \overrightarrow{OB}$

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

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

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

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

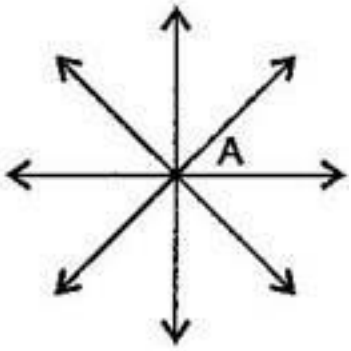
(d) Two pairs of intersecting lines are : $\overline{\mathrm{AD}}, \overline{\mathrm{CO}}$ and $\overline{\mathrm{AE}}$, $\overline{\mathrm{FE}}$

Question 4. How many lines can pass though:

(a) one given point?

(b) two given points

Answer: (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:

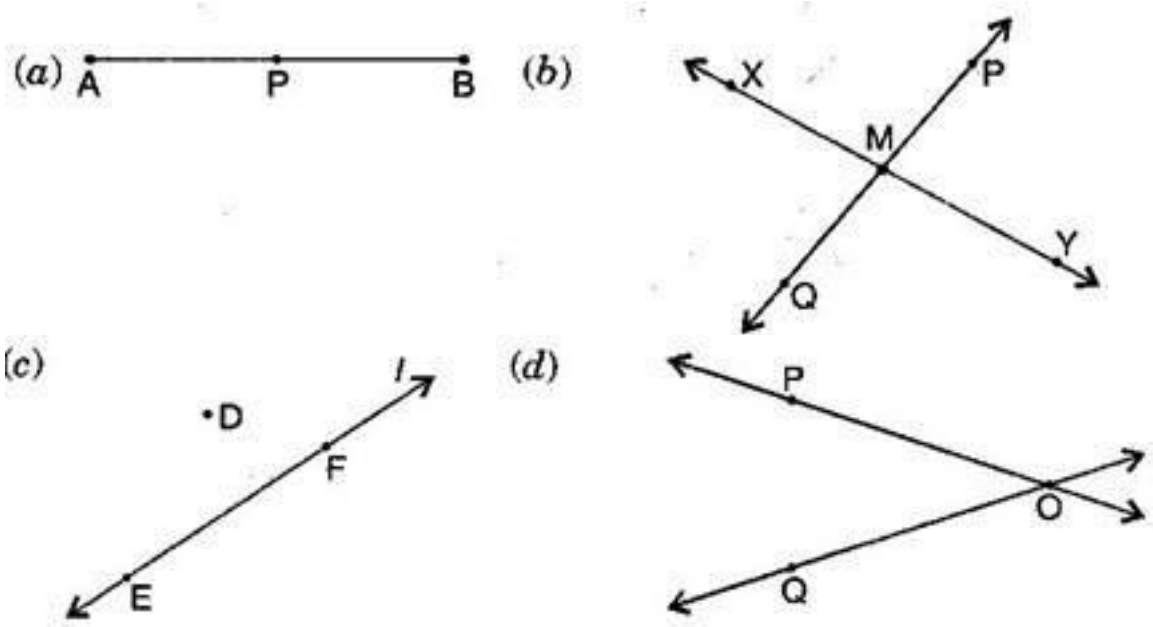
(a) Point P lies on $\overline{AB}$.

(b) $\overline{XY}$ and $\overline{PQ}$ intersect at M.

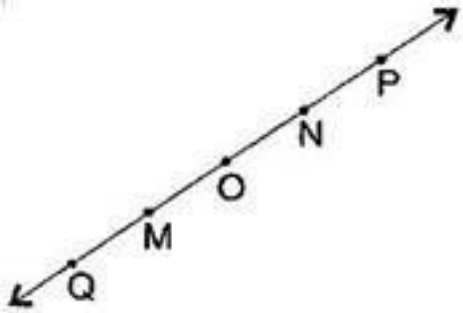
(c) Line l contains E and F but not D.

(d) $\overline{OP}$ and $\overline{OQ}$ meet at O.

Answer:



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 $\overrightarrow{OM}$..

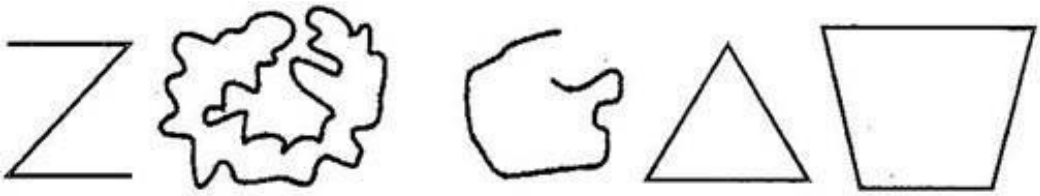
(i) Ray $\overrightarrow{OM}$. is not opposite to ray $\overrightarrow{OP}$.

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

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

Chaper 4 Basic Geometrical Ideas (Ex. 4.2)

Question 1. Classify the following curves as (i) Open or (ii) Closed.



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

Answer: (a) Open curve

(b) Closed curve

(c) Open curve

(d) Closed curve

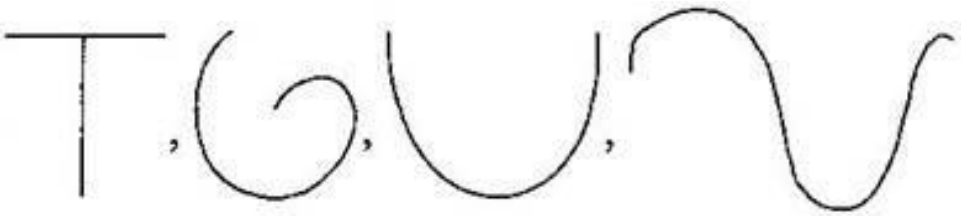
(e) Closed curve

Question 2. Draw rough diagrams to illustrate the following:

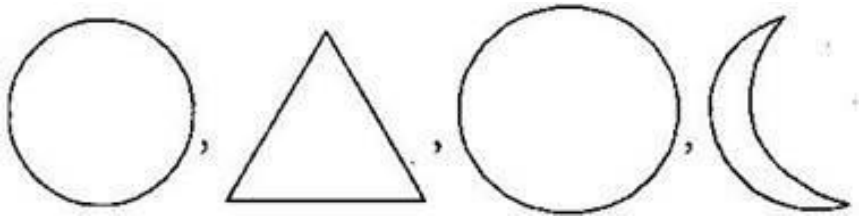
(a) Open curve

(b) Closed curve

Answer: Open curves:

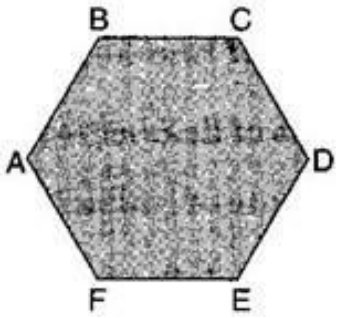


Closed curves



Question 3. Draw any polygon and shade its interior.

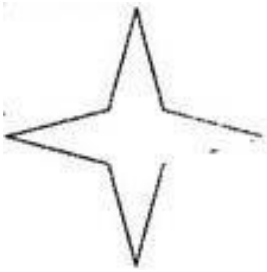
Answer: Polygon ABCDEF



Question 4. Consider the given figure and answer the questions:

(a) Is it a curve?

(b) Is it closed?



Answer: (a) No, it is not a curve.

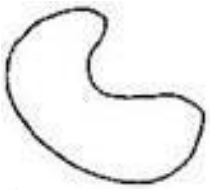
(b) No, it is not closed.

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.

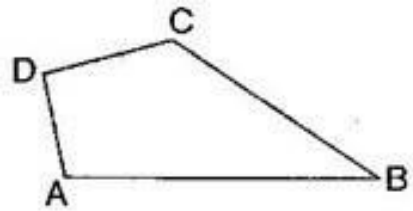
Answer: (a) 

(b) 

(c) Polygon with two sides cannot be draw.

Chaper 4 Basic Geometrical Ideas (Ex. 4.3)

Question 1. Name the angles in the given figure:



Answer: There are four angles in given figure:

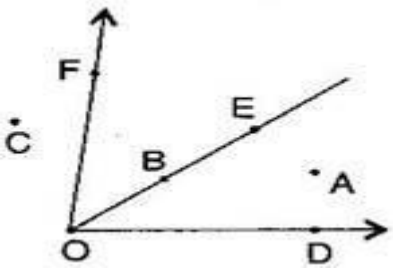
∠ABC, ∠CDA, ∠DAB, ∠DCB

Question 2. In the given diagram, name the point(s):

(a) In the interior of ∠DOE.

(b) In the exterior of ∠EOF.

(c) On ∠EOF.



Answer: (a) Point interior of ∠DOE : A

(b) Points exterior of ∠EOF : C, A, D

(c) Points on ∠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.

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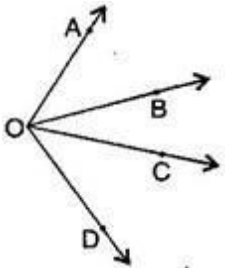
(d) Four points in common.

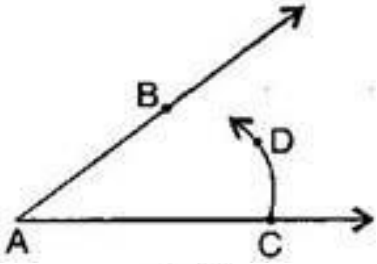
(e) One ray in common.

Answer:

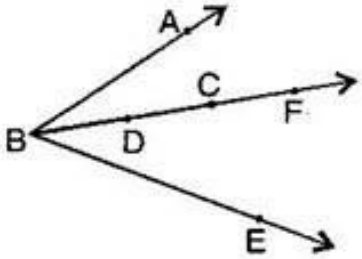
(a)



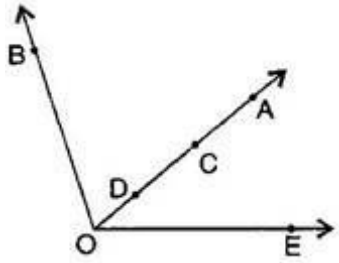
(b)



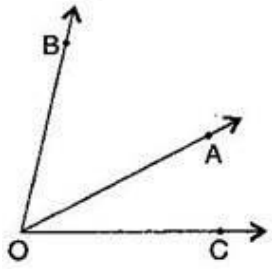
(c)



(d)



(e)



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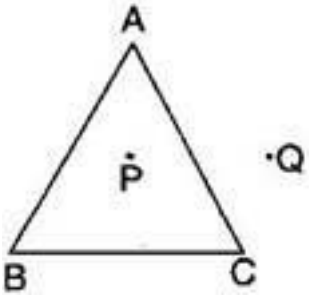
Chaper 4 Basic Geometrical Ideas (Ex. 4.4)

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:



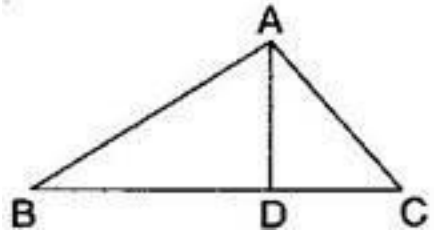
A is neither interior of the figure nor exterior of triangle. It is a vertex.

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 ∠B as common?



Answer: (a) The three triangles are: $\Delta ABC, \Delta ABD, \Delta ADC$

(b) Angles are: ∠ADB, ∠ADC, ∠ABD, ∠ACD, ∠BAD, ∠CAD, ∠BAC

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

(d) Triangles having common ∠B: $\Delta ABC, \Delta ABD,$

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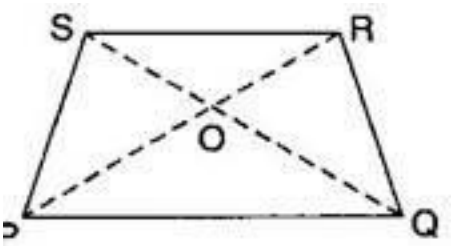
Chaper 4 Basic Geometrical Ideas (Ex. 4.5)

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:



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

Question 2. Draw a rough sketch of a quadrilateral KLMN. State:

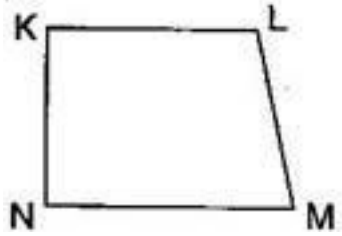
(a) Two pairs of opposite sides.
(b) Two pairs of opposite angles.
(c) Two pairs of adjacent sides.
(d) Two pairs of adjacent angles.

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

(b) Pair of opposite angles: ∠K and ∠M, ∠L and ∠N

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

(d) Pair of adjacent angles: ∠K and ∠N, ∠L and ∠M



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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: 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.

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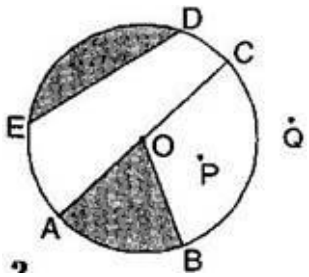
Chaper 4 Basic Geometrical Ideas (Ex. 4.6)

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: (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: ABC

Question 2. (a) Is every diameter of a circle also a chord?

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

Answer: (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:

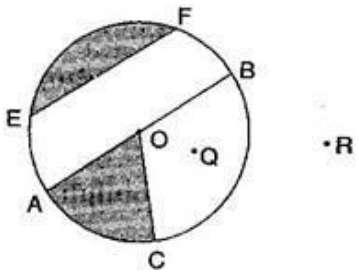
(a) Its centre.

(b) A radius.

(c) A diameter.

(d) A sector.

Answer:



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: (a) True

(b) True

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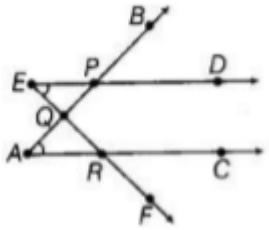
MIND MAP

This chapter consists of four different topics. The most probable questions from the examination point of view are given below.

TYPE: 1

1. Define the following terms:
   a) Line segment
   b) Line.
   c) Intersecting lines.
   d) Parallel lines

2. From the given figure identify:
   a) Points. b) Line c) Line segment e) Parallel lines.
   f) Intersecting lines. g) Ray



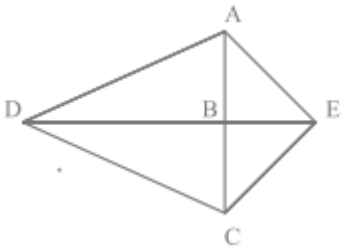
3. How many end points a line segment have?

TYPE: 2

1. Draw rough diagrams to illustrate the following:
   a. Open curve.
   b. Closed curve.

TYPE: 3

1. How many right angles are present in below figures and Name them also
   a.



2. If the sum of two angles is equal to an obtuse angle, then which of the following is not possible?
   (A) One obtuse angle and one acute angle.
   (B) One right angle and one acute angle.
   (C) Two acute angles.
   (D) Two right angles.

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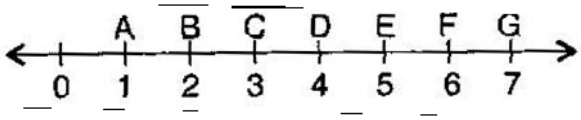
Class VI Mathematics
Ch 5. Understanding Elementary Shapes

Ex 5.1

Questions

1. What is the disadvantage in comparing line segments by mere observation?
2. Why is it better to use a divider than a ruler, while measuring the length of a line segment?
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, hen we can be sure that C lies between A and B.]
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?
5. Verify whether D is the mid-point of $\overline{AG}$.



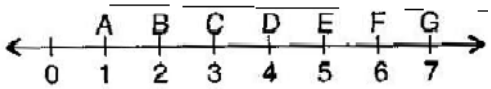
6. If B is the mid-point of $\overline{AC}$ and C is the mid-point of $\overline{BD}$, where A, B, C, D lie on a straight line, say why AB = CD?
7. Draw five triangles and measure their sides. Check in each case, of the sum of the lengths of any two sides is always less than the third side.

Answers

1. There may be chance of error due to improper viewing.
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.
3. Yes.

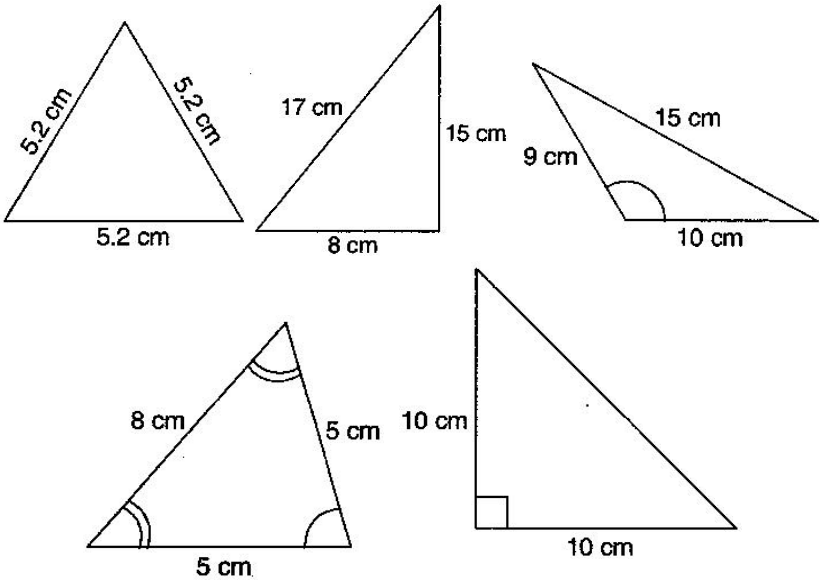
AB = 6.5 cm, AC = 3cm, CB = 3.5 cm
AC + CB = 3 cm + 3.5 cm = 6.5 cm = AB

4. $\overline{AC}$ is the longest line segment, thus B is the point between A and C.
5. AD = 3 units, DG = 3 units
   AD = DG.
   Thus, D is the mid-point.



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 eq. (i) and (ii),
   AB = CD

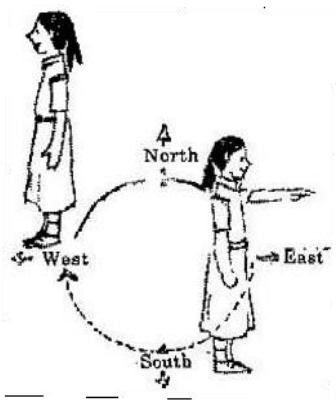
7. Yes, sum of two sides of a triangle is always greater than the third side.



Class –VI Mathematics (Ex. 5.2)
Questions

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

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?



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?)

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 fase east?
   (c) West and turn clockwise to face east?

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

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?

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?

Class –VI Mathematics (Ex. 5.2)

Answers

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.

2. (a) At 6 (b) At 8 (c) At 8 (d) At 2

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)

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

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

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

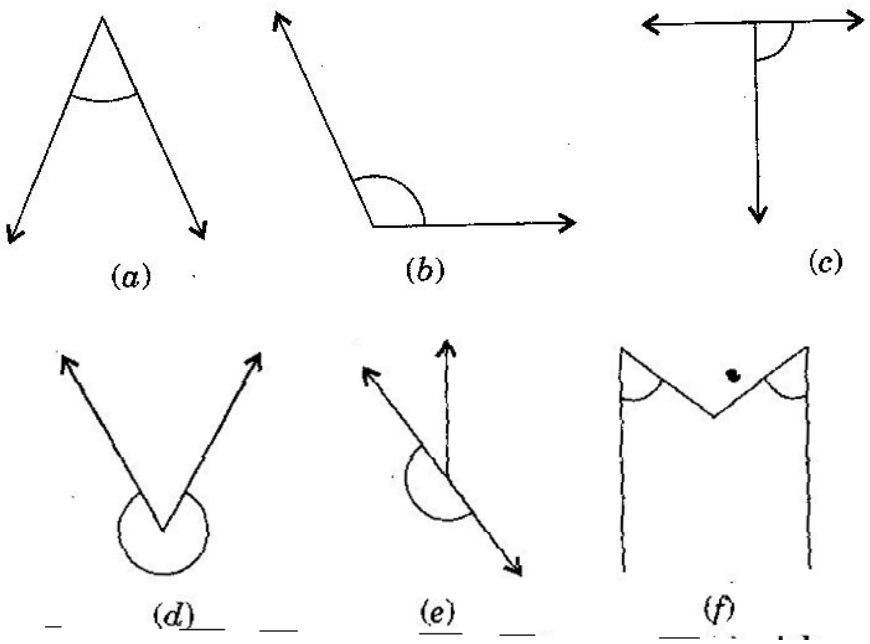
7. (a) At 9 (b) At 2 (c) At 7 (d) At 7

Class –VI Mathematics (Ex. 5.3)
Questions

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

2. Classify each one of the following angles as right, straight, acute, obtuse or refles:



Class –VI Mathematics (Ex. 5.3)

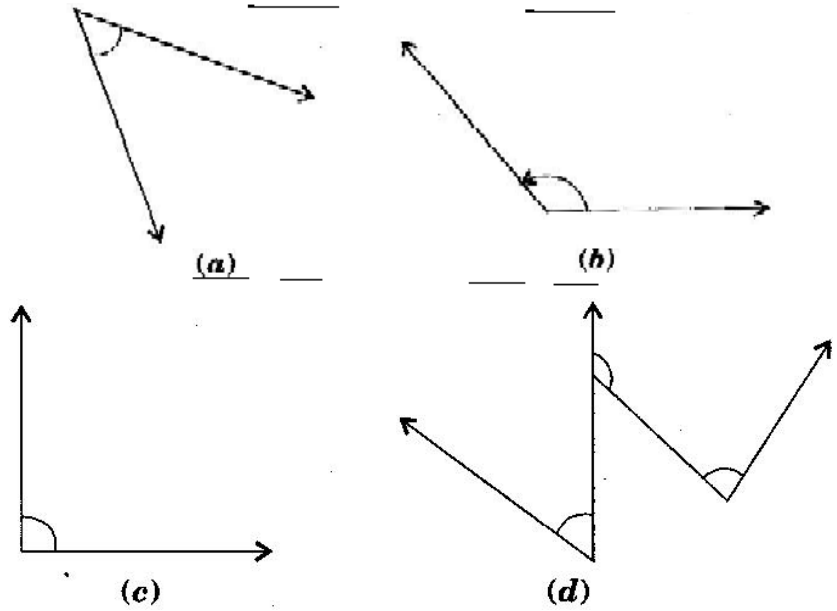
Answers

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

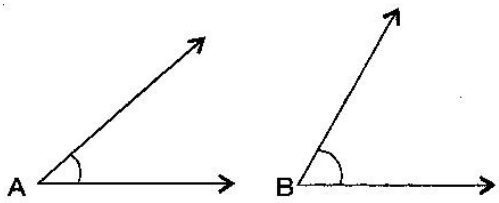
2. (a) Acute angle
   (b) Obtuse angle
   (c) Right angle
   (d) Reflex angle
   (e) Straight angle
   (f) Acute angle

Class –VI Mathematics (Ex. 5.4)
Questions

1. What is the measure of (i) a right angle? (ii) a straight angle?
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 $m\angle A > m\angle B$.
3. Write down the measure of:
   (a) some acute angles (b) some obtuse angles
   (give at least two examples of each)
4. Measure the angles given below, using the protractor and write down the measure:

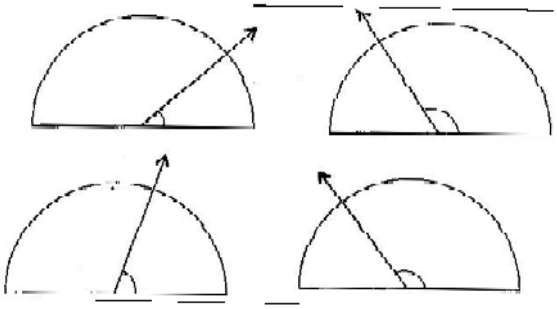


5. Which angle has a large measure? First estimate and then measure:
   Measure of angle A =
   Measure of angle B =

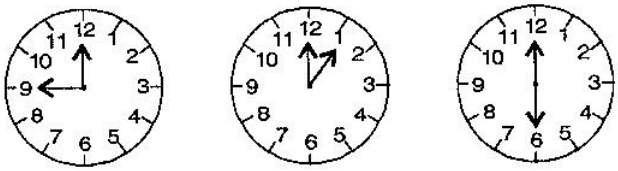


6. From these two angles which has larger measure? Estimate and then confirm by measuring them:

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_____.
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).

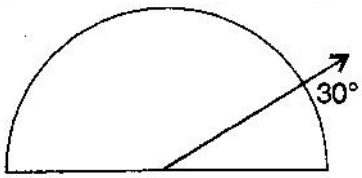


9. Find the angle measure between the hands of the clock in each figure:

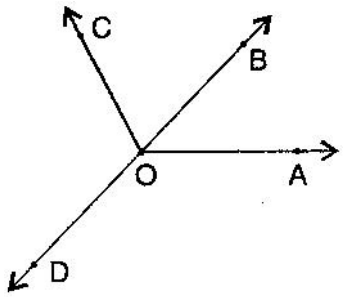


9.00 a.m. 1.00 p.m. 6.00 p.m.

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?



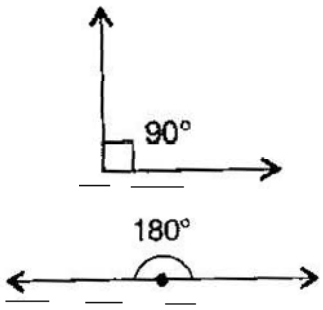
11. Measure and classify each angle:



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

Class –VI Mathematics (Ex. 5.4)
Answers

1. (i) 90°



(ii) 180°

2. (a) True (b) False (c) True (d) True (e) True

3. (a) $35°, 20°$ (b) $110°, 135°$

4. (a) $40°$ (b) $130°$ (c) 90° (d) 60°

5. $\angle B$ has larger measure.
$\angle A = 40°$ and $\angle B = 65°$

6. Second angle has larger measure.

7. (a) acute angle (b) obtuse angle
(c) straight angle (d) acute angle
(e) obtuse angle

8. (i) 30° (ii) 120° (iii) 60° (iv) 150°

9. (i) 90° (Right angle) (ii) 30° (Acute angle) (iii) 180° (Straight angle)

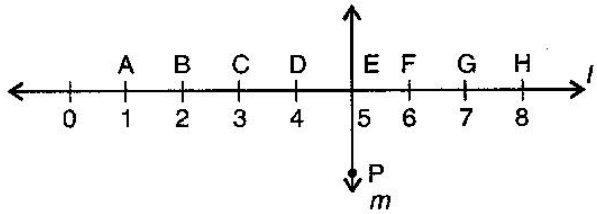
10. No, the measure of angle will be same.

11. Sol.

Angle	$\angle AOB$	$\angle AOC$	$\angle BOC$	$\angle DOC$	$\angle DOA$	$\angle DOB$
Measure	40°	130°	90°	90°	140°	180°
Type	Acute	Obtuse	Right	Right	Obtuse	Striaght

Class –VI Mathematics (Ex. 5.5)
Questions

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



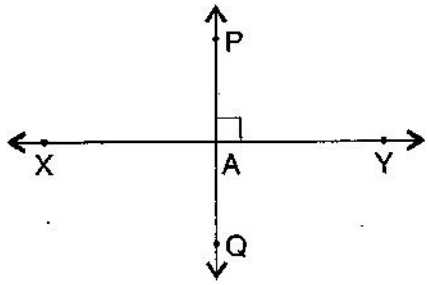
   (a) Is CE = EG?
   (b) Does PE bisect CG?
   (c) Identify any two line segments for which PE is the perpendicular bisector.
   (d) Are these true? (i) AC > FG (ii) CD = GH (iii) BC < EH

Class –VI Mathematics (Ex. 5.5)

Answers

1. (a) Perpendicular
   (b) Not perpendicular
   (c) Perpendicular
   (d) Not perpendicular

2. Sol.



$\angle PAY = 90^{\circ}$

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.

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

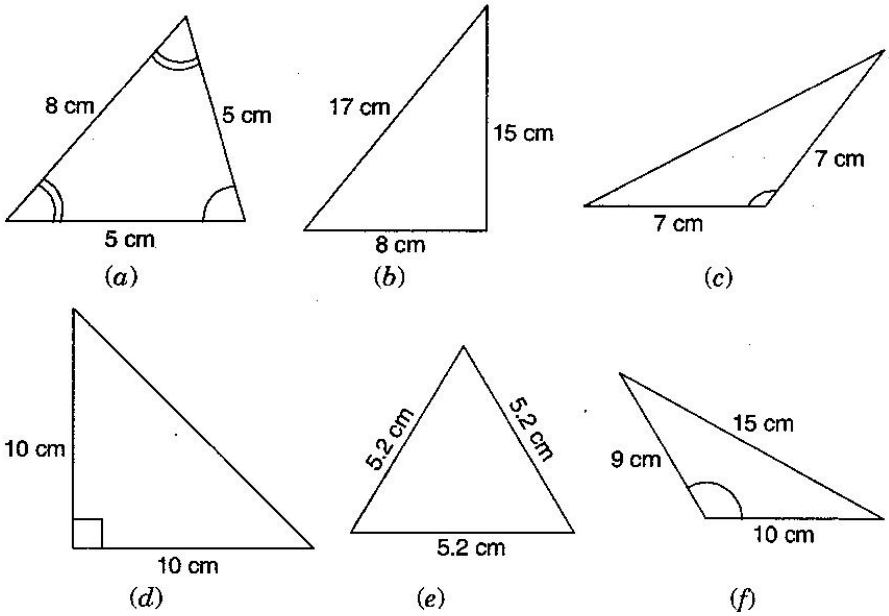
Class –VI Mathematics (Ex. 5.6)
Questions

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 $m\angle N = 80^{\circ}$.

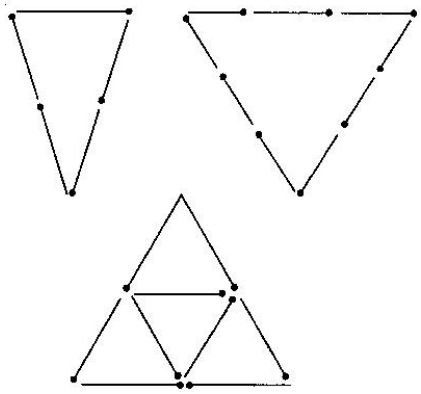
2. Match the following:

	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

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



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.

Class –VI Mathematics (Ex. 5.6)

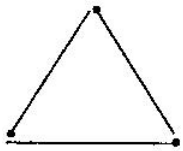
Answers

1. (a) Scalene triangle
   (b) Scalene triangle
   (c) Equilateral triangle
   (d) Right-angled triangle
   (e) Isosceles right-angled triangle
   (f) Acute-angled triangle

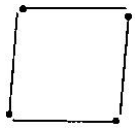
2. (i) → (e), (ii) → (g), (iii) → (a), (iv) → (f), (v) → (d), (vi) → (c), (vii) → (b)

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

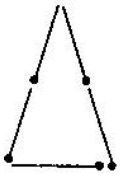
4. (a) 3 matchsticks
   This is an acute angle triangle and it is possible with 3 matchsticks to make a triangle because sum of two sides is greater than third side.

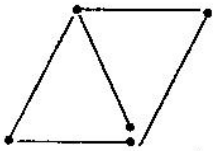


   (b) 4 matchsticks
   This is a square, hence with four matchsticks we cannot make triangle.

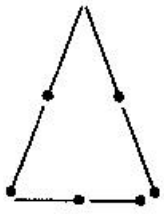


   (c) 5 matchsticks
   This is an acute angle triangle and it is possible to make triangle with five matchsticks, in this case sum of two sides is greater than third side.





   (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.



Class –VI Mathematics (Ex. 5.7)
Questions

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.

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.

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?

Class –VI Mathematics (Ex. 5.7)

Answers

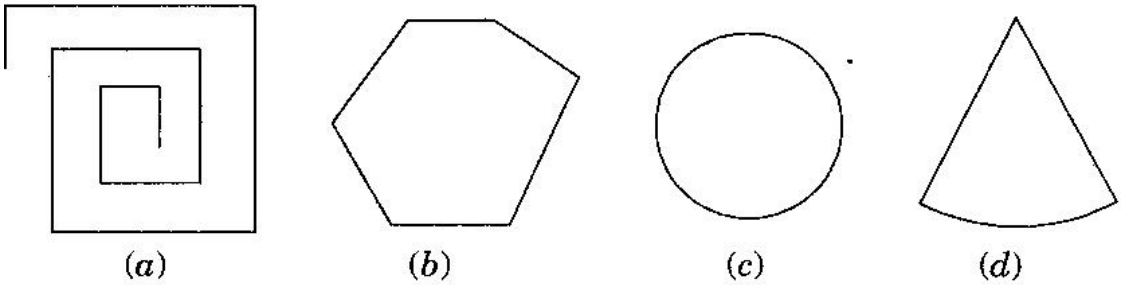
1. (a) True
   (b) True
   (c) True
   (d) True
   (e) False
   (f) False

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.

3. A square is a regular quadrilateral.

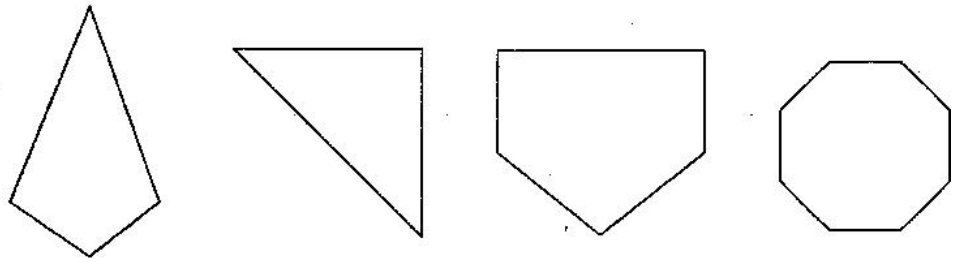
Class –VI Mathematics (Ex. 5.8)
Questions

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



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

2. Name each polygon:



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

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.
4. Draw a rough sketch of a regular octagon. (Use squared paper if you wish). Draw a rectangle by joining exactly four of the vertices of the octagon.
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.

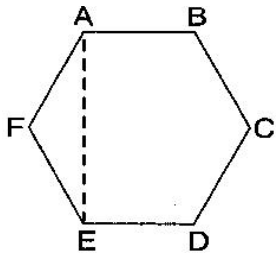
Class –VI Mathematics (Ex. 5.8)

Answers

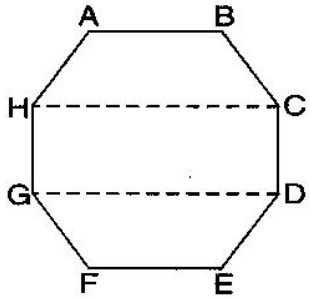
1. (a) As it is not a closed figure, therefore, it is not a polygon.
   (b) It is a polygon because it is closed by line segments.
   (c) It is not a polygon because it is not made by line segments.
   (d) It is not a polygon because it not made only by line segments, it has curved surface also.

2. (a) Quadrilateral (b) Triangle
   (c) Pentagon (d) Octagon

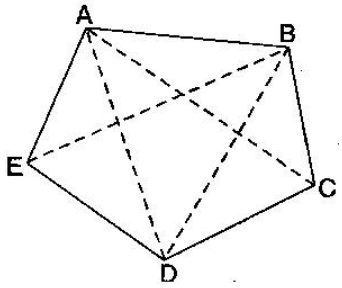
3. ABCDEF is a regular hexagon and triangle thus formed by joining AEF is an isosceles triangle.



4. ABCDEFGH is a regular octagon and CDGH is a rectangle.



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



Questions

1. Match the following:

(a) Cone

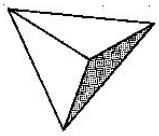
(b) Sphere

(c) Cylinder

(d) Cuboid

(e) Pyramid

(*i*)



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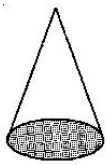

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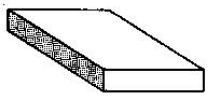
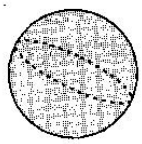
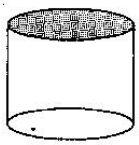


(*iv*)



(*v*)



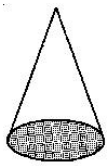
Give two example of each shape.

2. What shape is:
   (a) Your instrument box?
   (b) A brick?
   (c) A match box?
   (d) A road-roller?
   (e) A sweet laddu?

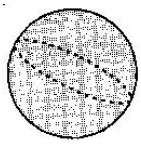
Answers

1. Sol.

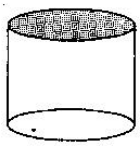
(a) Cone (ii)



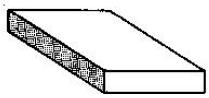
(b) Sphere (iv)



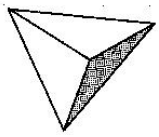
(c) Cylinder (v)



(d) Cuboid (iii)



(e) Pyramid (i)



2. (a) Cuboid
   (b) Cuboid
   (c) Cuboid
   (d) Cylinder
   (e) Sphere

DELHI PUBLIC SCHOOL, GANDHINAGAR
MIND MAP
CH.: 5 UNDERSTANDING ELEMENTARY SHAPES

SUBJECT: MATHEMATICS **CLASS: VI**

This chapter consists of six different topics. The most probable questions from the examination point of view are given below.

TYPE: 1 LINE SEGMENT

Q.1. Draw a line segment of 6.5 cm.

TYPE: 2 ANGLES : TYPES AND MEASUREMENT

Q.1. What fraction of a clockwise revolution does the hour hand of a clock turn through, when it goes from 1 to 10 ?

Q.2. Where will the hand of a clock stop if it starts at 5 and makes $\frac{3}{4}$ of a revolution, clockwise?

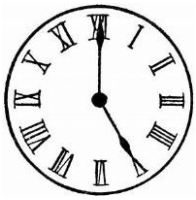
Q. 3 What part of a revolution have you turned through if you stand facing south and turn clockwise to face east?

Q.4 How many right angles do you make if you start facing west and turn to west?

Q.5. Where will the hour hand of a clock stop if it starts from 8 and turns through 2 right angles?

Q.6. Measure the following angles using protractor and classify each as right, straight, acute, obtuse or reflex :

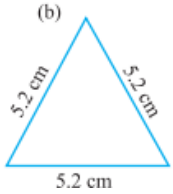
Q.7. Find the angle measure between the hands of the clock in each figure :

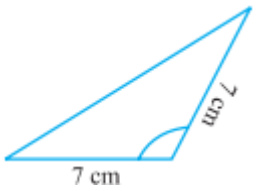


TYPE: 3 CLASSIFICATION OF TRIANGLES

Q.1. Name the types of following triangles in two different ways :

(a) ΔXYZ with m Y∠ = 90° and XY = YZ





TYPE: 4 QUADRILATERALS

Q.1. Give reason: A rectangle can be thought of as a special parallelogram.

TYPE: 5 POLYGONS

Q.1. Name a polygon with seven sides.

TYPE: 6 THREE DIMENSIONAL SHAPES

Q.1. Write number of faces, edges and vertices in (a) Cube (b) Square Pyramid

Class VI Mathematics
Ch 6. Integers

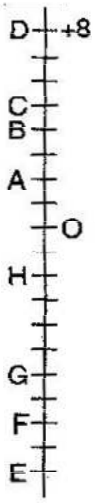
Class –VI Mathematics (Ex. 6.1)
Questions

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

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.

3. Represent the following numbers on number line:
   (a) +5 (b) –10 (c) +8 (d) –1 (e) –6

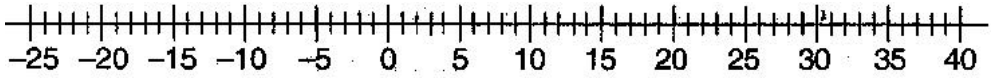
4. Adjacent figure is a vertical number line, representing integers. Observe it and locate the following points:
   (a) If point D is +8 then which point is –8?
   (b) Is point G a negative integer or a positive integer?
   (c) Write integers for points B and E.
   (d) Which point marked on this number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



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

Place	Temperature	
Siachin	$10^{o}C$ below $0^{o}C$	_____
Shimla	$2^{o}C$ below $0^{o}C$	_____
Ahmedabad	$30^{o}C$ above $0^{o}C$	_____
Delhi	$20^{o}C$ above $0^{o}C$	_____
Srinagar	$5^{o}C$ below $0^{o}C$	_____

   (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 $10^{o}C$.

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

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

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

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.

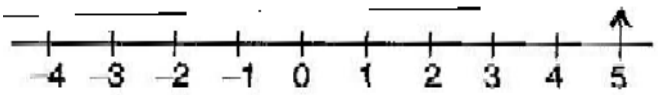
10. Draw a number line and answer the following:
   (a) Draw a number line will we reach if we move 4 numbers to the right of –2.
   (b) Which number will we reach if we move 5 numbers to the left of 1.
   (c) If we are at –8 on the number line, in which direction should we move to reach –13?
   (d)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

Class –VI Mathematics (Ex. 6.1)
Answers

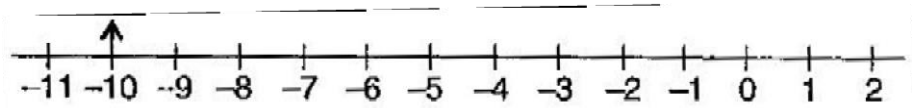
1. (a) Decrease in weight
(b) 30 km south
(c) 326 AD
(d) Profit of ` 700
(e) 100 m below sea level

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

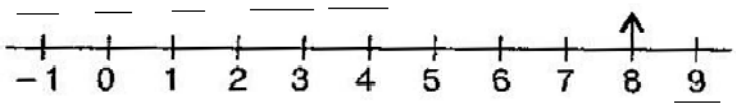
3. (a)



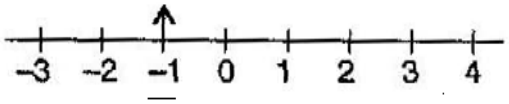
(b)



(c)



(d)



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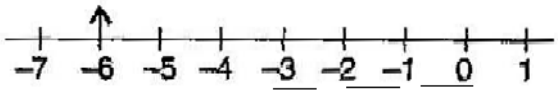
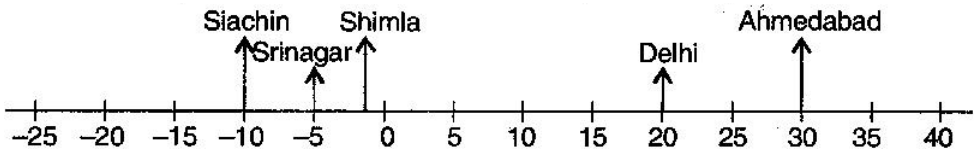


4. (a) F
(b) Negative
(c) B = (+) 4; E = (–) 10
(d) E
(e) D, C, B, A, O, H, G, F, E

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

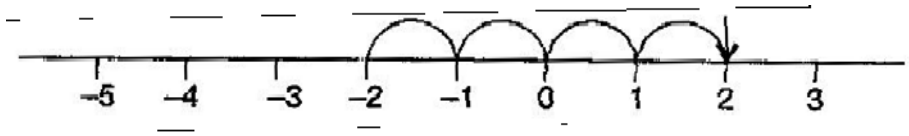
6. (a) 9 is right to 2
   (b) –3 is right to –8
   (c) 0 is right to –1
   (d) 10 is right to –11
   (e) 6 is right to –6
   (f) 1 is right to –100

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

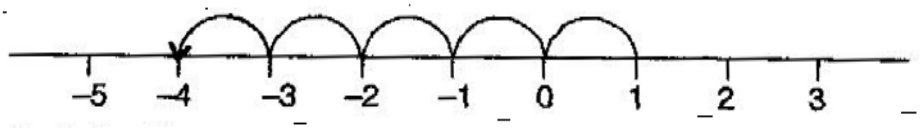
8. (a) –19, –18, –17, –16
   (b) –11, –12, –13, –14

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

10. (a)



(b)



(c) On left side

(d) On right side

Class –VI Mathematics (Ex. 6.2)
Questions

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

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)

3. Add without using number line:
   (a) 11 + (–7)
   (b) (–13) + (+18)
   (c) (–10) + (+19)
   (d) (–250) + (+150)
   (e) (–380) + (–270)
   (f) (–217) + (–100)

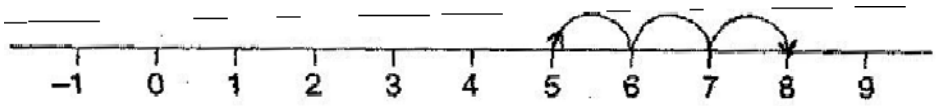
4. Find the sum of:
   (a) 137 and –354
   (b) –52 and 52
   (c) –213, 39 and 192
   (d) –50, –200 and 300

5. Find the value of:
   (a) (–7) + (–9) + 4 + 16
   (b) 37 + (–2) + (–65) + (–8)

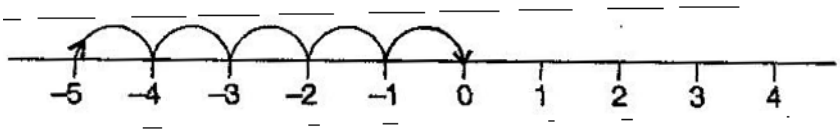
Class –VI Mathematics (Ex. 6.2)

Answers

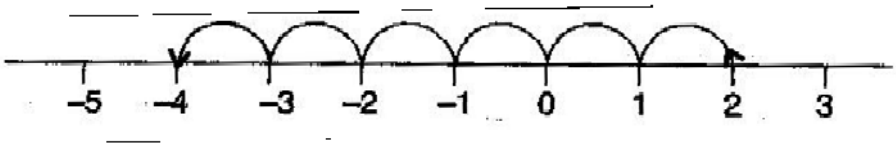
1. (a) 8



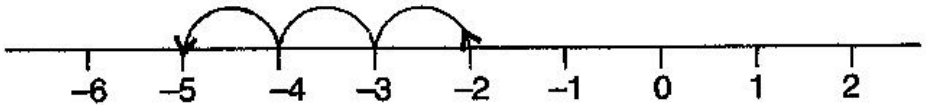
(b) 0



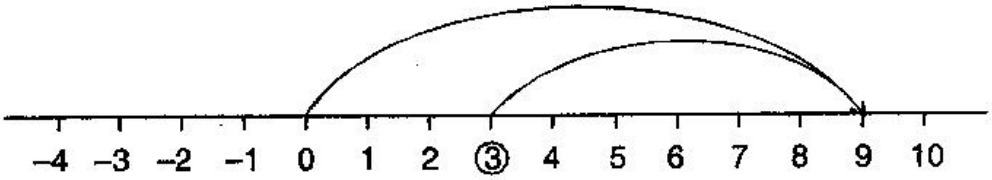
(c) –4



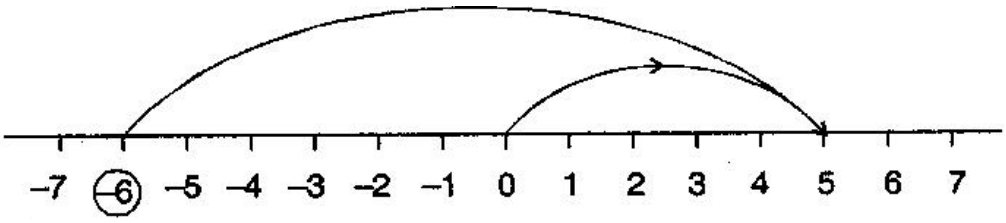
(d) –5



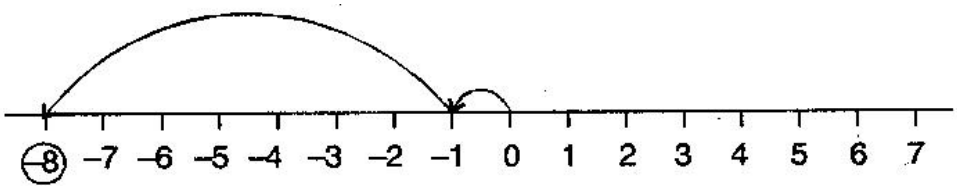
2. (a) 9 + (–6) = 3



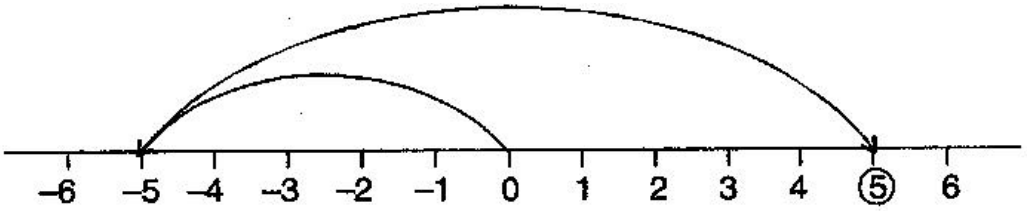
(b) 5 + (–11) = –6



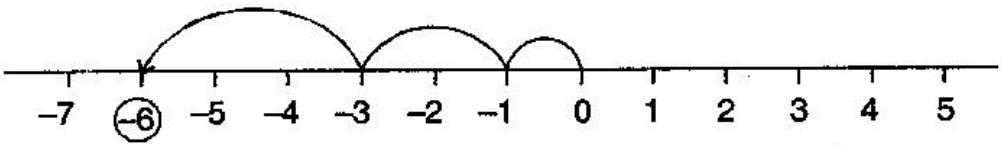
(c) (–1) + (–7) = –8



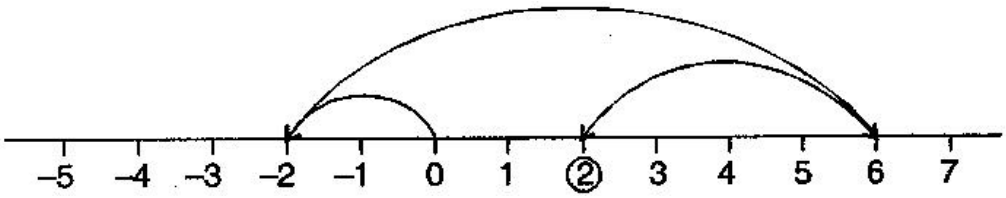
(d) (–5) + 10 = 5



(e) (–1) + (–2) + (–3) = –6



(f) (–2) + 8 + (–4) = 2



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

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

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

Class –VI Mathematics (Ex. 6.3)
Questions

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

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)

3. Fill in the blanks:
   (a) (–8) +_____= 0
   (b) 13 +_____= 0
   (c) 12 + (–12) = _____
   (d) (–4) +_____= –12
   (e)_____– 15 = –10

4. Find:
   (a) (–7) – 8 – (–25)
   (b) (–13) + 32 – 8 – 1
   (c) (–7) + (–8) + (–90)
   (d) 50 – (–40) – (–2)

Class –VI Mathematics (Ex. 6.3)

Answers

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

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

3. (a) (–8) + $\underline{8}$ = 0
   (b) 13 + $\underline{(-13)}$ = 0
   (c) 12 + (–12) = $\underline{0}$
   (d) (–4) + $\underline{(-8)}$ = –12
   (e) $\underline{5}$ – 15 = –10

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

DELHI PUBLIC SCHOOL, GANDHINAGAR

MIND MAP
CH.: 6 INTEGERS

SUBJECT: MATHEMATICS **CLASS: VI**

This chapter consists of three different topics. The most probable questions from examination point of view are given below.

TYPE: 1 INTEGERS

Q.1. Write opposites of 30 km north

Q.2 Represent the given statement as integers with appropriate sign.
A deposit of rupees two hundred.

Q.3 Write all the integers between (-3) and 3 in ascending order.

Q.4 Write four negative integers greater than – 20.

Q.5 Compare : (– 3) + (– 6) _____ (– 3) – (– 6)

Q.6 Arrange the given integers in ascending/descending order.

TYPE: 2 NUMBER LINE

Q.1. Represent the given numbers on number line.

Q.2. Draw a number line and answer the following
(a) Which number will we reach if we move 4 numbers to the right of (– 2).
(b) If we are at – 8 on the number line, in which direction should we move to reach (– 13)?

Q.3. Add/Subtract on number line

TYPE: 3 OPERATIONS ON INTEGERS

Q.1. Add without using number line : (– 13) + (+ 18)

Q.2. Find the sum of – 50, – 200 and 300

Q.3. Find : (–32) – (– 40)

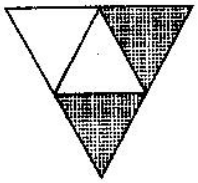
(– 13) + 32 – 8 – 1

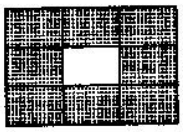
(37) + (– 2) + (– 65) + (– 8)

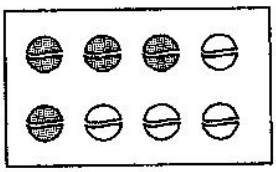
Class VI Mathematics
Ch. 7 Fractions

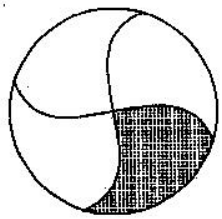
Class –VI Mathematics (Ex. 7.1)
Questions

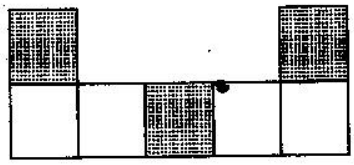
1. Write the fraction representing the shaded portion:

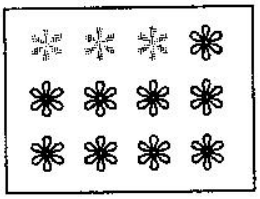

(i)

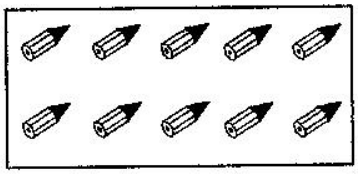

(ii)

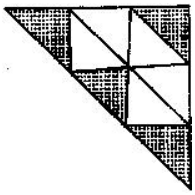

(iii)

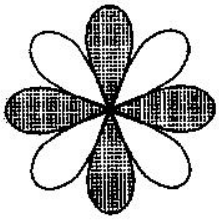

(iv)

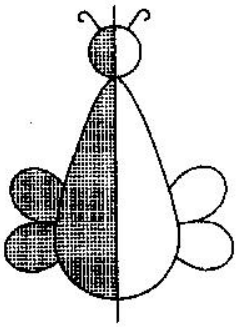

(v)


(vi)

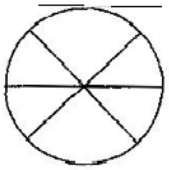

(vii)

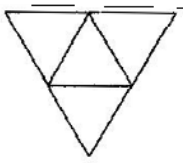

(viii)

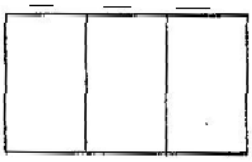

(ix)

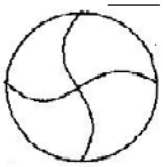

(x)

2. Colour the part according to the given fraction:


(i) $\frac{1}{6}$

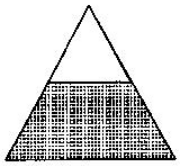

(ii) $\frac{1}{4}$


(iii) $\frac{1}{3}$


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


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

3. Identify the error, if any?



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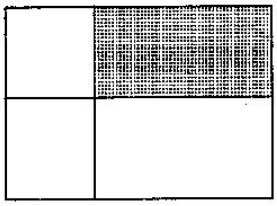
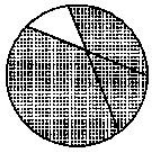
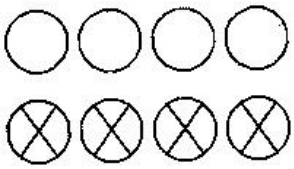


This is 1/4



This is 3/4

4. What fraction of a day is 8 hours?
5. What fraction of an hour is 40 minutes?
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?
7. Kanchan dyes dresses. She had to dye 30 dresses. She has so far finished 20 dresses. What fraction of dresses has she finished?
8. Write the natural numbers from 2 to 12. What fraction of them are prime numbers?
9. Write the natural numbers from 102 to 113. What fraction of them are prime numbers?
10. What fraction of these circles have 'X's in them?

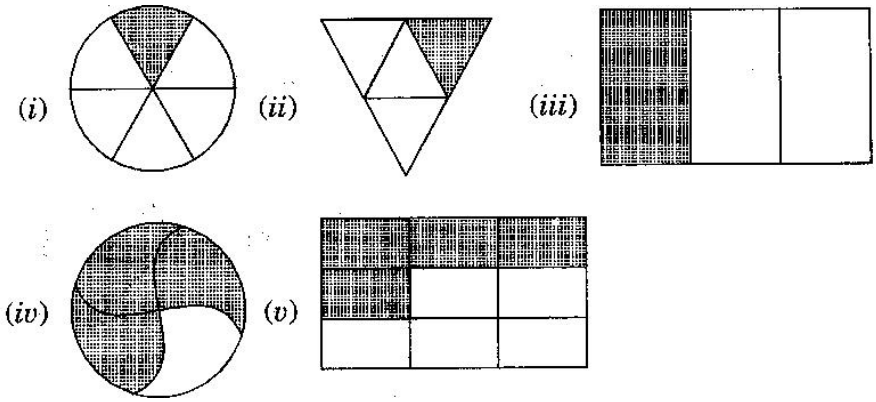


11. Kristin received a CD player for her birthday. She bought 3 CDs and received 5 others as gifts. What fraction of her total CDs did she buy and what fraction did she receive as gifts?

Class –VI Mathematics (Ex. 7.1)
Answers

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) $\frac{1}{2}$

2. Sol.



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

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

5. Since, 1 hour = 60 minutes.
   Therefore, the fraction of 40 minutes = $\frac{40}{60} = \frac{2}{3}$

6. (a) Arya will divide each sandwich into three equal parts and give one part of each sandwich to each one of them.
   (b) $1 \times \frac{1}{3} = \frac{1}{3}$

7. Total number of dresses = 30

Work finished = 20

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

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 = $\frac{5}{11}$

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 = $\frac{4}{12} = \frac{1}{3}$

10. Total number of circles = 8 and number of circles having 'X' = 4
    Hence, the fraction = $\frac{4}{8}$

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 = $\frac{5}{8}$

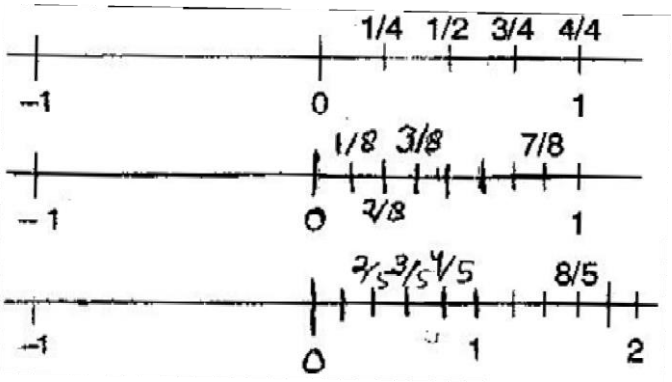
Class –VI Mathematics (Ex. 7.2)
Questions

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) $\frac{2}{5}, \frac{3}{5}, \frac{8}{5}, \frac{4}{5}$
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) $\frac{35}{9}$
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) $8\frac{4}{9}$

Class –VI Mathematics (Ex. 7.2)

Answers

1. (a)



(b)

(c)

2. (a) $3\overline{)\begin{array}{r}6\\20\\-18\\\hline 2\end{array}}$

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

(b) $5\overline{)\begin{array}{r}2\\11\\-10\\\hline 1\end{array}}$

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

(c) $7\overline{)\begin{array}{r}2\\17\\-14\\\hline 3\end{array}}$

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

(d) $5\overline{)\begin{array}{r}5\\28\\-25\\\hline 3\end{array}}$

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

(e) $6\overline{)\begin{array}{r}3\\19\\-18\\\hline 1\end{array}}$

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

(f) $9\overline{)\begin{array}{r}3\\35\\-27\\\hline 8\end{array}}$

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

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

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

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

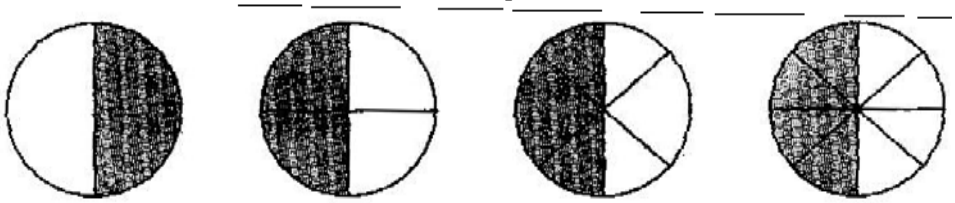
(d) $10\frac{3}{5} = \frac{(10\times 5)+3}{5} = \frac{50+3}{5} = \frac{53}{5}$

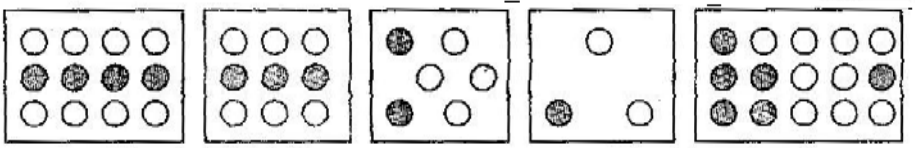
(e) $9\frac{3}{7} = \frac{(9\times 7)+3}{7} = \frac{63+3}{7} = \frac{66}{7}$

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

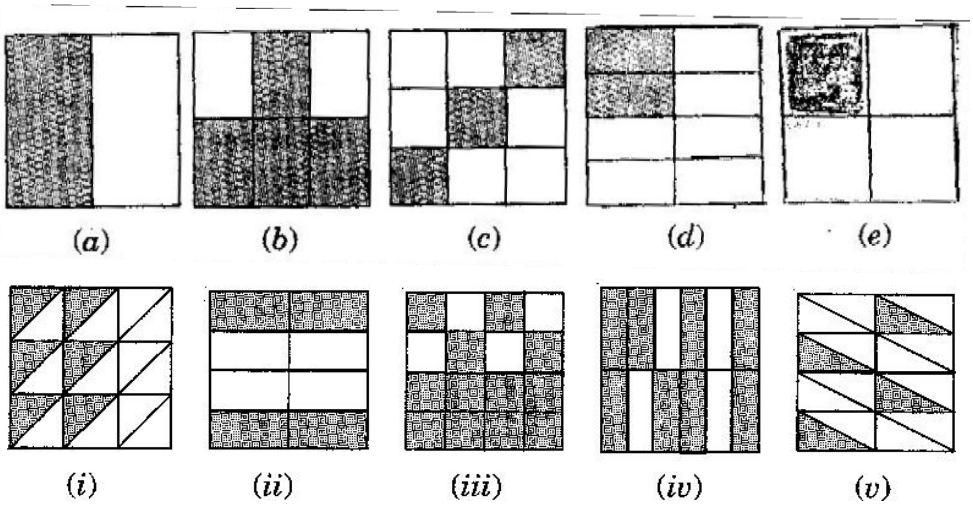
Class –VI Mathematics (Ex. 7.3)
Questions

1. Write the fractions. Are all these fractions equivalent:

(a) 

(b) 

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



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

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

(a) denominator 20 (b) numerator 9
(c) denominator 30 (d) numerator 27

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

(a) numerator 9 (b) denominator 4

6. Check whether the given fraction are equivalent:
   (a) $\frac{5}{9}, \frac{30}{54}$ (b) $\frac{3}{10}, \frac{12}{50}$ (c) $\frac{7}{13}, \frac{5}{11}$
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) $\frac{2}{8}$ —
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?
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) $\frac{9}{10}$

Class –VI Mathematics (Ex. 7.3)

Answers

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.

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

3. (a) $\frac{2}{7} = \frac{2\times 4}{7\times 4} = \frac{8}{\boxed{28}}$ (b) $\frac{5}{8} = \frac{5\times 2}{8\times 2} = \frac{10}{\boxed{16}}$ (c) $\frac{3}{5} = \frac{3\times 4}{5\times 4} = \frac{\boxed{12}}{20}$

(d) $\frac{45}{60} = \frac{45\div 3}{60\div 3} = \frac{15}{\boxed{20}}$ (e) $\frac{18}{24} = \frac{18\div 6}{24\div 6} = \frac{\boxed{3}}{4}$

4. (a) $\frac{3}{5} = \frac{3\times 4}{5\times 4} = \frac{12}{20}$ (b) $\frac{3}{5} = \frac{3\times 3}{5\times 3} = \frac{9}{15}$

(c) $\frac{3}{5} = \frac{3\times 6}{5\times 6} = \frac{18}{30}$ (d) $\frac{3}{5} = \frac{3\times 9}{5\times 9} = \frac{27}{45}$

5. (a) $\frac{36}{48} = \frac{36\div 4}{48\div 4} = \frac{9}{12}$ (b) $\frac{36}{48} = \frac{36\div 12}{48\div 12} = \frac{3}{4}$

6. (a) $\frac{5}{9}, \frac{30}{54}$ = $\frac{5\times 6}{9\times 6}, \frac{30}{54}$ = $\frac{30}{54}, \frac{30}{54}$

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

(b) $\frac{3}{10}, \frac{12}{50}$ = $\frac{3\times 5}{10\times 5}, \frac{12}{50}$ = $\frac{15}{50}, \frac{12}{50}$

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.

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

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.

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) $\frac{9}{10}$

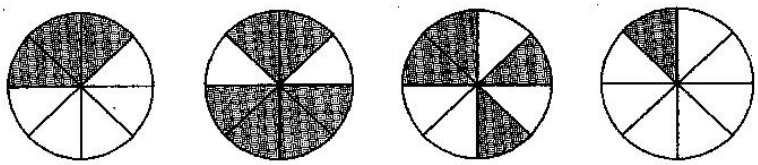
(iii) $\frac{\cancel{660}}{\cancel{990}} = \frac{2}{3}, \frac{4}{6}, \frac{6}{9}$ (a) $\frac{2}{3}$

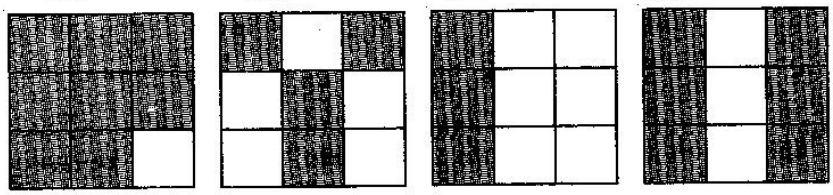
(iv) $\frac{\cancel{180}}{\cancel{360}} = \frac{1}{2}, \frac{2}{4}, \frac{3}{6}$ (c) $\frac{1}{2}$

(v) $\frac{\cancel{220}}{\cancel{550}} = \frac{2}{5}, \frac{4}{10}, \frac{6}{15}$ (b) $\frac{2}{5}$

Class –VI Mathematics (Ex. 7.4)
Questions

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

(a) 

(b) 

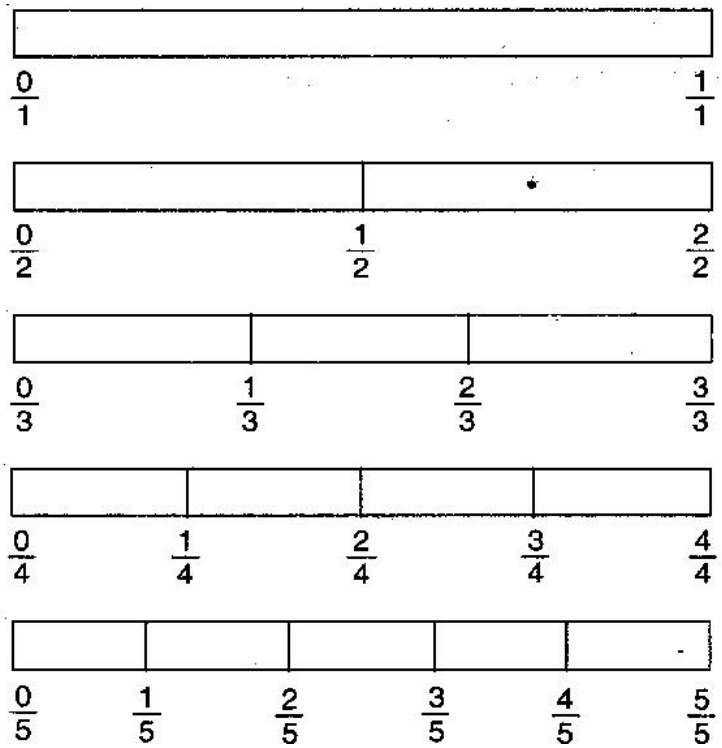
(c) Show $\frac{2}{6}, \frac{4}{6}, \frac{8}{6}$ and $\frac{6}{6}$ on the number line. Put appropriate signs between the fractions given:

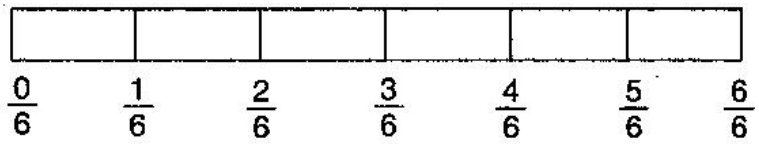
$\frac{5}{6} \square \frac{2}{6}$, $\frac{3}{6} \square 0$, $1 \frac{6}{6}$, $\frac{8}{6} \square \frac{5}{6}$

2. Compare the fractions and put an appropriate sign:

(a) $\frac{3}{6} \square \frac{5}{6}$ (b) $1\frac{1}{7} \square 1\frac{1}{4}$ (c) $\frac{4}{5} \square \frac{5}{5}$ (d) $\frac{3}{5} \square \frac{3}{7}$

3. Make five more each pairs and put appropriate signs.
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.

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) $\frac{5}{7} \square \frac{15}{21}$

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) $\frac{3}{15}$ (e) $\frac{10}{60}$ (f) $\frac{15}{75}$ — —

(g) $\frac{12}{60}$ (h) $\frac{16}{96}$ (k) $\frac{3}{18}$ ( ) — —

(c) $\frac{8}{50}$ $\frac{1}{4}$

(i) $\frac{12}{75}$ — $\frac{2}{5}$

(d) $\frac{10}{0}$ —

(j) $\frac{12}{72}$ —

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 $\frac{4}{30}$?

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

6

9. Rafiq exercised for $\frac{3}{}$ of an hour, while Rohit

exercised for $\frac{3}{4}$ of an hour. Who exercised for a longer time?

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?

Class –VI Mathematics (Ex. 7.4)

Answers

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

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

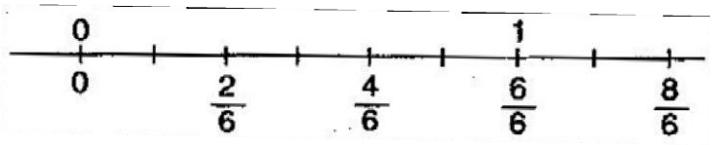
Descending order: $\frac{6}{8} > \frac{4}{8} > \frac{3}{8} > \frac{1}{8}$

(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



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

2. (a) $\frac{3}{6} < \frac{5}{6}$ (b) $\frac{1}{7} < \frac{1}{4}$ (c) $\frac{4}{5} < \frac{5}{5}$ (d) $\frac{3}{5} > \frac{3}{7}$

3. (a) $\frac{9}{10} > \frac{6}{10}$ (b) $\frac{1}{3} > \frac{1}{6}$ (c) $\frac{1}{8} < \frac{1}{5}$ (d) $\frac{7}{8} < \frac{11}{8}$

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

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) $\frac{0}{1} \square \frac{0}{6}$

Sol.

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

(e) $\frac{0}{1} \boxed{=} \frac{0}{6}$

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) $\frac{5}{7} \boxed{=} \frac{15}{21}$

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)]

7. (a) $\frac{5}{9}$ and $\frac{4}{5}$ $\Rightarrow$ $\frac{5\times5}{9\times5} = \frac{25}{45}$ and $\frac{4\times9}{5\times9} = \frac{36}{45}$ [∵ 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 $\frac{5}{9}$ $\Rightarrow$ $\frac{9\times9}{16\times9} = \frac{81}{144}$ and $\frac{5\times16}{9\times16} = \frac{80}{144}$ [∵ 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 $\frac{16}{20}$ $\Rightarrow$ $\frac{4\times20}{5\times20} = \frac{80}{100}$ and $\frac{16\times5}{20\times5} = \frac{80}{100}$ [∵ 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 $\frac{4}{30}$ $\Rightarrow$ $\frac{1\times2}{15\times2} = \frac{2}{30}$ and $\frac{4\times1}{30\times1} = \frac{4}{30}$ [∵ L.C.M. of 15 and 30 is 30]

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

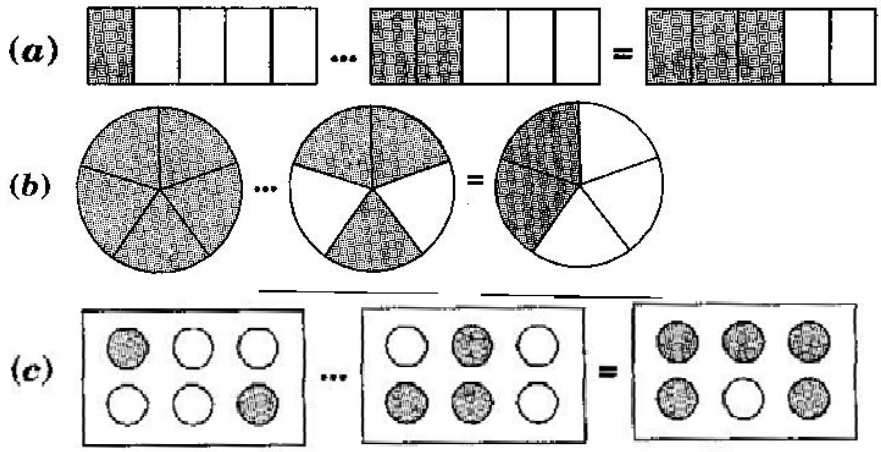
8. Ila read 25 pages out of 100 pages.
   Fraction of reading the pages = $\frac{25}{100} = \frac{1}{4}th$ part of book
   Lalita read $\frac{2}{5}th$ part of book = $\frac{40}{100}$ pages
   Since $\frac{1}{4} < \frac{2}{5}$
   Therefore, Ila read less.

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.

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.

Class –VI Mathematics (Ex. 7.5)
Questions

1. Write the fractions appropriately as additions or subtractions{



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) $1+0$

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

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?

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) $\square+\frac{5}{27}=\frac{12}{27}$

5. Javed was given of a basket of oranges. What fraction of oranges was left in the basket?

Class –VI Mathematics (Ex. 7.5)

Answers

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

2. (a) $\frac{1}{18}+\frac{1}{18}=\frac{1+1}{18}=\frac{2}{18}=\frac{1}{9}$ (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) $\frac{1}{22}+\frac{21}{22}=\frac{1+21}{22}=\frac{22}{22}=1$

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

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

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

   Therefore, they painted complete wall.

4. (a) $\frac{4}{10}$ (c) $\frac{6}{6}$

5. Total = 1 (d) $\frac{}{}$ – $\frac{}{}$

(b) 21

   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.

Class –VI Mathematics (Ex. 7.6)
Questions

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) $\frac{4}{3}-\frac{1}{2}$
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?
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.
4. Fill in the boxes:
   (a) $\square-\frac{5}{8}=\frac{1}{4}$ (b) $\square-\frac{1}{5}=\frac{1}{2}$ (c) $\frac{1}{2}-\square=\frac{1}{6}$
5. Complete the addition – subtraction box:

(a)

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

(b)

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

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?
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?
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?
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?

Class –VI Mathematics (Ex. 7.6)

Answers

1. (a) L.C.M. of 3 and 7 is 21

$$\therefore \quad \frac{2}{3}+\frac{1}{7}=\frac{2\times 7+1\times 3}{21}=\frac{14+3}{21}=\frac{17}{21}$$

(b) L.C.M. of 10 and 15 is 30

$$\therefore \quad \frac{3}{10}+\frac{7}{15}=\frac{3\times 3+7\times 2}{30}=\frac{9+14}{30}=\frac{23}{30}$$

(c) L.C.M. of 9 and 7 is 63

$$\therefore \quad \frac{4}{9}+\frac{2}{7}=\frac{4\times 7+2\times 9}{63}=\frac{28+18}{63}=\frac{46}{63}$$

(d) L.C.M. of 7 and 3 is 21

$$\therefore \quad \frac{5}{7}+\frac{1}{3}=\frac{5\times 3+7\times 1}{21}=\frac{15+7}{21}=\frac{22}{21}=1\frac{1}{21}$$

(e) L.C.M. of 5 and 6 is 30

$$\therefore \quad \frac{2}{5}+\frac{1}{6}=\frac{2\times 6+5\times 1}{30}=\frac{12+5}{30}=\frac{17}{30}$$

(f) L.C.M. of 5 and 3 is 15

$$\therefore \quad \frac{4}{5}+\frac{2}{3}=\frac{4\times 3+2\times 5}{15}=\frac{12+10}{15}=\frac{22}{15}=1\frac{7}{15}$$

(g) L.C.M. of 4 and 3 is 12

$$\therefore \quad \frac{3}{4}-\frac{1}{3}=\frac{3\times 3-4\times 1}{12}=\frac{9-4}{12}=\frac{5}{12}$$

(h) L.C.M. of 6 and 3 is 6

$$\therefore \quad \frac{5}{6}-\frac{1}{3}=\frac{5\times 1-2\times 1}{6}=\frac{5-2}{6}=\frac{\cancel{3}}{\cancel{6}}=\frac{1}{2}$$

(i) L.C.M. of 3, 4 and 2 is 12

$$\therefore \quad \frac{2}{3}+\frac{3}{4}+\frac{1}{2}=\frac{2\times 4+3\times 3+1\times 6}{12}=\frac{6+9+6}{12}=\frac{23}{12}=1\frac{11}{12}$$

(j) L.C.M. of 2, 3, and 6 is 6

$$\therefore \quad \frac{1}{2}+\frac{1}{3}+\frac{1}{6}=\frac{1\times 3+1\times 2+1\times 1}{6}=\frac{3+2+1}{6}=\frac{\cancel{6}}{\cancel{6}}=1$$

(k) L.C.M. of 3 and 3 is 3

$$\therefore \quad \frac{4}{3}+\frac{11}{3}=\frac{4+11}{3}=\frac{\cancel{15}}{\cancel{3}}=5$$

(l) L.C.M. of 3 and 4 is 12

$\therefore \quad \frac{14}{3}+\frac{13}{4}=\frac{14\times 4+13\times 3}{12}=\frac{56+39}{12}=\frac{95}{12}=7\frac{11}{12}$

(m) L.C.M. of 5 and 5 is 5

$\therefore \quad \frac{16}{5}-\frac{7}{5}=\frac{16-7}{5}=\frac{9}{5}=1\frac{4}{5}$

(n) L.C.M. of 3 and 2 is 6

$\therefore \quad \frac{4}{3}-\frac{1}{2}=\frac{4\times 2-1\times 3}{6}=\frac{8-3}{6}=\frac{5}{6}$

2. Ribbon bought by Sarita = $\frac{2}{5}$ m and Ribbon bought by Lalita = $\frac{3}{4}$ m

Total length of ribbon = $\frac{2}{5}+\frac{3}{4}=\frac{2\times 4+5\times 3}{20}$ [$\because$ L.C.M. of 5 and 4 is 20]

$=\frac{8+15}{20}=\frac{23}{20}=1\frac{3}{20}$ m

Therefore, they bought $1\frac{3}{20}$ m of ribbon.

3. Cake taken by Naina = $1\frac{1}{2}$ piece and Cake taken by Najma = $1\frac{1}{3}$ piece

Total cake taken = $1\frac{1}{2}+1\frac{1}{3}=\frac{3}{2}+\frac{4}{3}=\frac{3\times 3+4\times 2}{6}$ [$\because$ L.C.M. of 2 and 3 is 6]

$=\frac{9+8}{6}=\frac{17}{6}=2\frac{5}{6}$

Therefore total consumption of cake is $2\frac{5}{6}$.

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) $\frac{1}{2}-\frac{1}{6}=\frac{3-1}{6}=\frac{2}{6}$

5. Sol.

(a)

$\frac{2}{3}$	$\frac{4}{3}$	$\frac{6}{3}$
$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$
$\frac{1}{3}$	$\frac{2}{3}$	$\frac{3}{3}$

(b)

$\frac{1}{2}$	$\frac{1}{3}$	$\frac{5}{6}$
$\frac{1}{3}$	$\frac{1}{4}$	$\frac{7}{12}$
$\frac{1}{6}$	$\frac{1}{12}$	$\frac{3}{12}$

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.

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, distance covered by walking us $\frac{2}{5}$ km.

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]

$\because \quad \frac{25}{30} > \frac{12}{30} \quad \Rightarrow \quad \frac{5}{6} > \frac{2}{5}$

$\therefore$ Asha's bookshelf is more covered than Samueal.

Difference = $\frac{25}{30} - \frac{12}{30} = \frac{13}{30}$

9. Time taken by jaidev = $2\frac{1}{5}$ minutes = $\frac{11}{5}$ minutes

Time taken by Rahul = $\frac{7}{4}$ minutes

Difference = $\frac{11}{5} - \frac{7}{4} = \frac{11\times4 - 7\times5}{20}$ [$\because$ 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.

DELHI PUBLIC SCHOOL, GANDHINAGAR

MIND MAP

CH.: 7 FRACTIONS

SUBJECT: MATHEMATICS **CLASS: VI**

This chapter consists of five different topics. The most probable questions from examination point of view are given below.

TYPE: 1 TYPES OF FRACTIONS

Q.1. Represent the given fractions on the number line. $\frac{1}{2}, \frac{5}{4}, \frac{7}{4}, \frac{5}{2}$

Q.2. Express $\frac{35}{9}$ as mixed fraction.

Q.3 Express $2\frac{5}{6}$ as mixed fraction.

TYPE: 2 EQUIVALENT FRACTIONS AND SIMPLEST FORM

Q.1 Find the equivalent fraction of $\frac{2}{9}$ with denominator 63.

Q.2 Replace ☐ by the correct number : $\frac{2}{7} = \frac{8}{\square}$

Q.3 Check whether the given fractions are equivalent. $\frac{7}{13}$ *and* $\frac{5}{11}$

Q.4 Reduce the give fractions to simplest form $\frac{48}{60}$

TYPE: 3 COMPARISION OF FRACTIONS

Q.1 Compare the given fractions and put an appropriate sign. $\frac{5}{7}$ ☐ $\frac{15}{21}$

Q.2 Arrange the given fractions in ascending/descending order. $\frac{5}{6}, \frac{7}{12}, \frac{4}{3}, \frac{9}{4}$

TYPE: 4 ADDITION AND SUBTRACTION OF INTEGERS

Q.1. Solve : (a) $3 - \frac{12}{5}$ (b) $\frac{1}{2} + \frac{1}{3} + \frac{1}{6}$ (c) $\frac{2}{5} + 3\frac{7}{3} - \frac{4}{15}$

TYPE: 5 WORD PROBLEMS

Q.1. What fraction of an hour is 40 minutes?

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

Q.3 Nandini's 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?

Ch 3. Playing with Numbers

Class –VI Mathematics (Ex. 3.1)
Questions

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

2. Write first five multiples of:
   (a) 5 (b) 8 (c) 9

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

4. Find all the multiples of 9 up to 100.

Class –VI Mathematics (Ex. 3.1)

Answers

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

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.

3. (i) → (b), (ii) → (d), (iii) → (a), (iv) → (f), (v) → (e)
4. Multiples of 9 up to 100 are:
   9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99

Class –VI Mathematics (Ex. 3.2)
Questions

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

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.
4. Write down separately the prime and composite numbers less than 20.
5. What is the greatest prime number between 1 and 10?
6. Express the following as the sum of two odd numbers:
   (a) 44 (b) 36 (c) 24 (d) 18

7. Give three pairs of prime numbers whose difference is 2.
   [Remark: Two prime numbers whose difference is 2 are called twin primes.]
8. Which of the following numbers are prime:
   (a) 23 (b) 51 (c) 37 (d) 26
9. Write seven consecutive composite numbers less than 100 so that there is no prime number between them.
10. Express each of the following numbers as the sum of three odd primes:
    (a) 21 (b) 31 (c) 53 (d) 61
11. Write five pairs of prime numbers less than 20 whose sum is divisible by 5.
    [Hint: 3 + 7 = 10]
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_____.

Class –VI Mathematics (Ex. 3.2)

Answers

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 an even number.
   Example: 2 + 4 = 6, 6 + 8 = 14

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

3. 17 and 71; 37 and 73; 79 and 97
4. Prime numbers: 2, 3, 5, 7, 11, 13, 17, 19
   Composite numbers: 4, 6, 8, 9, 10, 12, 14, 15, 16, 18

5. The greatest prime number between 1 and 10 is '7'.
6. (a) 3 + 41 = 44 (b) 5 + 31 = 36 (c) 7 + 17 = 24 (d) 7 + 11 = 18
7. 3 and 5; 5 and 7; 11 and 13
8. (a) 23 and (c) 37 are prime numbers.
9. 90, 91, 92, 93, 94, 95, 96
10. (a) 21 = 3 + 7 + 11 (b) 31 = 3 + 11 + 17
    (c) 53 = 13 + 17 + 23 (d) 61 = 19 + 29 + 13

11. 2 + 3 = 5; 7 + 13 = 20; 3 + 17 = 20; 2 + 13 = 15; 5 + 5 = 10
12. (a) Prime number
    (b) Composite number
    (c) Prime number and composite number
    (d) 2
    (e) 4
    (f) 2

Class –VI Mathematics (Ex. 3.3)
Questions

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**								
128	Yes	No	Yes	No	No	Yes	No	No	No
990									
1586									
275									
6686									
639210									
429714									
2856									
3060									
406839									

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

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

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

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

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

Class –VI Mathematics (Ex. 3.3)

Answers

1. Sol.

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

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.
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.

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.

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 → $\underline{2}6724 = 2 + 6 + 7 + 2 + 4 = 21$

Largest digit : 8 → $\underline{8}6724 = 8 + 6 + 7 + 2 + 4 = 27$

(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 → $476592 = 4 + 7 + 6 + 5 + 0 + 2 = 33$

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, $92\underline{8}389$ → 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, $8\underline{6}9484$ → Odd places = 8 + 9 + 8 = 25

Even places = 6 + 4 + 4 = 14

Difference = 25 – 14 = 11

Class –VI Mathematics (Ex. 3.4)
Questions

1. Find the common factors of:
   (a) 20 and 28 (b) 15 and 25
   (c) 35 and 50 (d) 56 and 120

2. Find the common factors of:
   (a) 4, 8 and 12 (b) 5, 15 and 25

3. Find the first three common multiples of:
   (a) 6 and 8 (b) 12 and 18

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

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

Class –VI Mathematics (Ex. 3.4)

Answers

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

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

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

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

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.

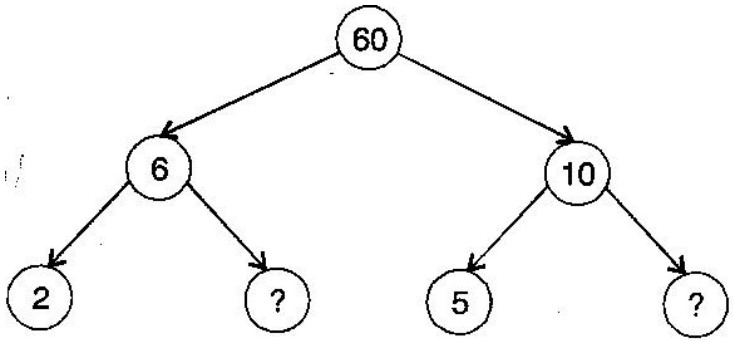
6. 5 x 12 = 60. The number must be divisible by 60.

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

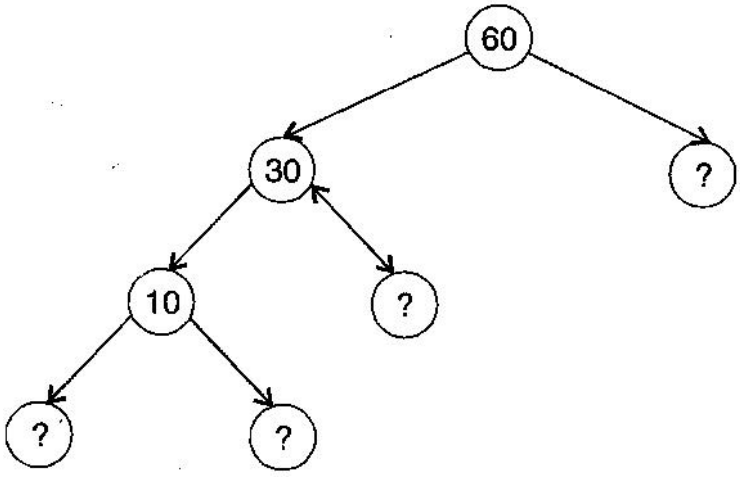
Class –VI Mathematics (Ex. 3.5)
Questions

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.

2. Here are two different factor trees for 60. Write the missing numbers.
   (a)



   (b)



3. Which factors are not included in the prime factorization of a composite number?
4. Write the greatest 4-digit number and express it in terms of its prime factors.
5. Write the smallest 5-digit number and express it in terms of its prime factors.

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.
7. The product of three consecutive numbers is always divisible by 6. Verify this statement with the help of some examples.
8. The sum of three consecutive numbers is always divisible by 4. Verify this statement with the help of some examples.
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

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.]

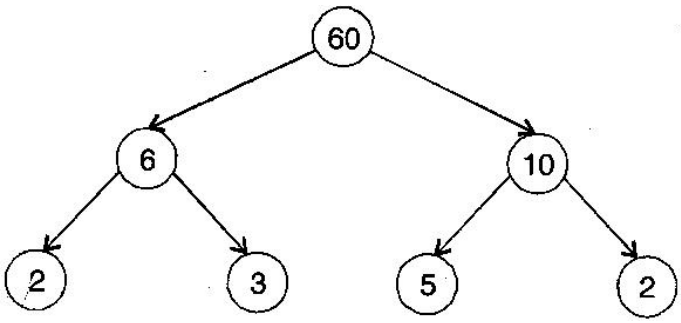
11. 18 is divisible by both 2 and 3. It is also divisible by 2 x 3 = 6. Similarly, a number is divisible by 4 and 6. Can we say that the number must be divisible by 4 x 6 = 24? If not, give an example to justify your answer.
12. I am the smallest number, having four different prime factors. Can you find me?

Class –VI Mathematics (Ex. 3.5)

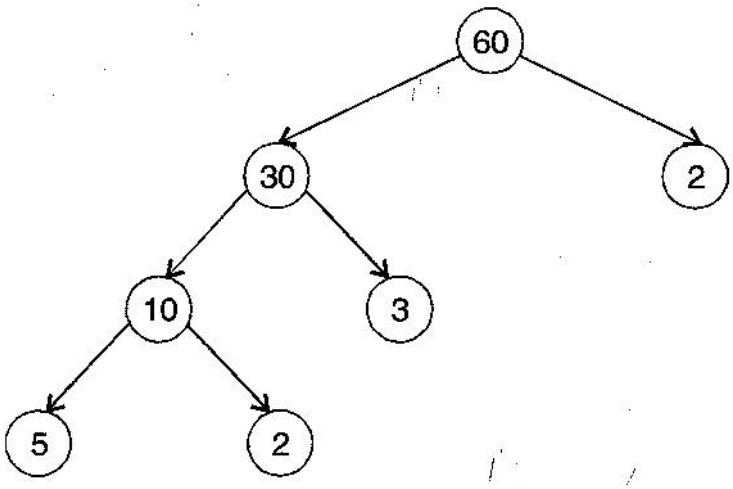
Answers

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

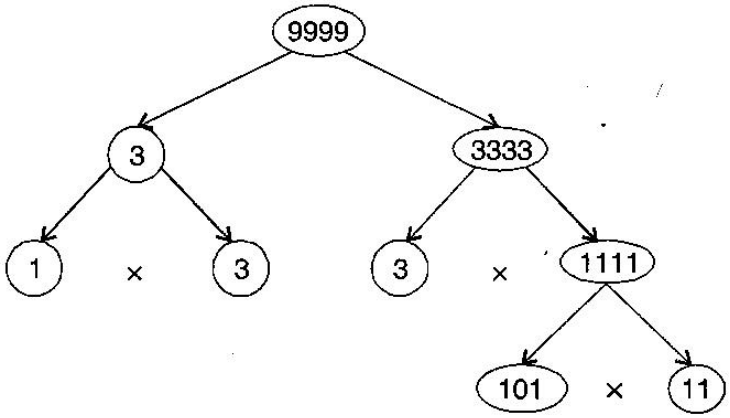
   (a)



   (b)

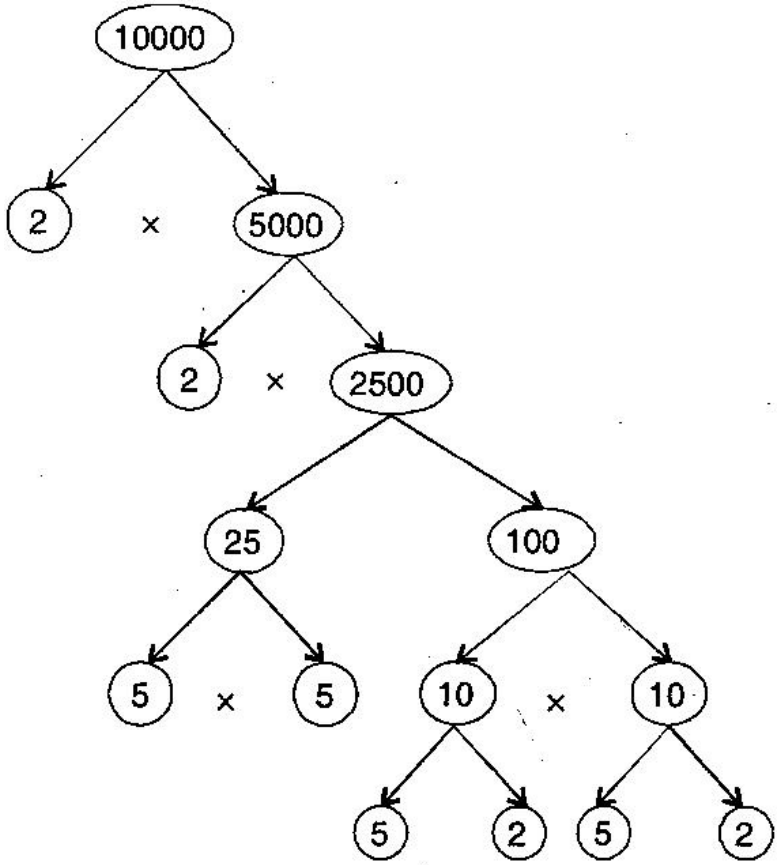


3. 1
4. The greatest four digit number is 9999.



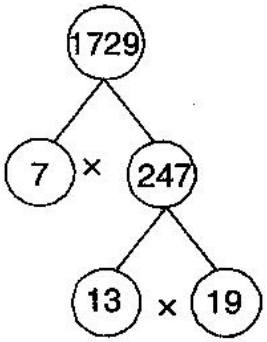
   The prime factors of 9999 are 3 x 3 x 11 x 101.

5. The smallest five digit number is 10000.



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

6. Sol.



Prime factors of 1729 are 7 x 13 x 19.
The difference of two consecutive prime factors is 6.

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

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.

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

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

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

12. 2 x 3 x 5 x 7 = 210

Class –VI Mathematics (Ex. 3.6)
Questions

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

2. What is the H.C.F. of two consecutive:
   (a) numbers?
   (b) even numbers?
   (c) odd numbers?

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.?

Class –VI Mathematics (Ex. 3.6)

Answers

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

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.

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

Class –VI Mathematics (Ex. 3.7)
Questions

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.
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?
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.
4. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.
5. Determine the largest 3-digit number which is exactly divisible by 8, 10 and 12.
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?
7. Three tankers contain 403 liters and 465 liters of diesel respectively. Find the maximumcapacity of a container that can measure the diesel of three containers exact number of times.
8. Find the least number which when divided by 6, 15 and 18, leave remainder 5 in each case.
9. Find the smallest 4-digit number which is divisible by 18, 24 and 32.
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?

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?

Class –VI Mathematics (Ex. 3.7)

Answers

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.

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

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.

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

$$24\overline{)\,24}\;4$$
$$-24$$
$$4$$

   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

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,

$$120\overline{)\,999}\;8$$
$$-960$$
$$39$$

   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

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

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 liters of container is required to measure the quantity.
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

9. L.C.M. of 18, 24 and 32 = 2 x 2 x 2 x 2 x 3 x 3 = 288
   The smallest four-digit number = 1000
   Now, $288\overline{)1000}$ (3, -864, 136)
   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

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.

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.

DELHI PUBLIC SCHOOL, GANDHINAGAR

MIND MAP

CH.: 3 PLAYING WITH NUMBERS

SUBJECT: MATHEMATICS **CLASS: VI**

This chapter consists of seven different topics. The most probable questions from examination point of view are given below.

TYPE: 1 FACTORS AND MULTIPLES

Q.1. Find all the factors of 36.

Q.2. Find first five multiples of 8.

TYPE: 2 PRIME AND COMPOSITE NUMBERS

Q.1. Express 24 as the sum of two odd primes.

Q.2. Express 53 as the sum of three odd primes

TYPE: 3 DIVISIBILITY RULES

Q.1. Use divisibility rules to check if the number 6072 is divisible by 6 and 8.

Q.2. Use divisibility rules to check if the number 8931 is divisible by 9 or not.

Q.3. Use divisibility rules to check if the number 563761 is divisible by 11or not.

TYPE: 4 SOME MORE DIVISIBILITY RULES

Q.1. Find the common factors of 4, 8 and 12.

Q.2. A number is divisible by both 5 and 12. By which other number will that number be always divisible?

Q.3. Find the common multiples of 5 and 6 less then 100.

TYPE: 5 CO-PRIME NUMBERS

Q.1. Which of the following numbers are co-prime?
(a) 52 and 81 (b) 294 and 256

TYPE: 6 PRIME FACTORISATION

Q.1. Draw factor tree of 30.

Q.2. Write the greatest 4-digit number and express it in terms of its prime factors.

Q.3. Express 230 as the product of prime factors using division method.

TYPE: 7 HCF AND LCM

Q.1. Find the HCF of the numbers 64, 96 and 144.

Q.2. Find the LCM of the numbers 70, 140 and 350.

Q.3. Word Problems

1. Shobha has two pieces of ribbon. One piece is 720 cm long and the other piece is 900 cm long. She wants to cut both these ribbons into strips of equal length that are as long as possible. How long should each strip be?
2. Swami packed 288 oranges and 624 apples in each boxes. He packed oranges and apples in separate boxes. He put equal number of fruits in each box. What is the maximum number of fruits that can be put in each box?
3. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.
4. Determine the greatest 3-digit number exactly divisible by 8, 10 and 12.
5. Find the least number which when divided by 6, 15 and 18 leave remainder 5 in each case.

Ch 1. Knowing Our Numbers

Class –VI Mathematics (Ex. 1.1)
Questions

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

2. Place commas correctly and write the numerals:
   (a) Seventry-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.

3. Insert commas suitable and write the names according to Indian system of numeration:
   (a) 87595762
   (b) 8546283
   (c) 99900046
   (d) 98432701

4. Insert commas suitable and write the names according to International system of numeration:
   (a) 78921092
   (b) 7452283
   (c) 99985102
   (d) 48049831

Class –VI Mathematics (Ex. 1.1)

Answers

1. (a) 10 (b) 10
   (c) 10 (d) 10
   (e) 10

2. (a) 73,75,307 (b) 9,05,00,041
   (c) 7,52,21,302 (d) 58,423,202
   (e) 23,30,010

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

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

Class –VI Mathematics (Ex. 1.2)
Questions

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.
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?
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?
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 o the month. How much was the sale for the two weeks together? In which week was the sale greater and by how much?
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.
6. A machine, on an average, manufactures 2,825 screws a day. How many screws did it produce in the month of January 2006?
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?
8. A student multiplied 7236 by 65 instead of multiplying by 56. By how much was his answer greater than the correct answer?
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?
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?
11. The distance between the school and the house of a student's house is 1 km 875 m. Everyday she walks both ways. Find the total distance covered by her in six days.
12. A vessel has 4 liters and 500 ml of curd. In how many glasses each of 25 ml capacity, can it be filled?

Class –VI Mathematics (Ex. 1.2)

Answers

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.

2. Runs to achieve = 10,000
   Runs scored = – 6,980
   Runs required = 3,020
   Therefore, he needs 3,020 more runs.

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.

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.

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.

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.

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.

8. Wrong answer = 7236 x 65

```
   7236
   x 65
  36180
 43416 x
 470340
```

   Correct answer = 7236 x 56

```
   7236
   x 56
  43416
 36180 x
 405216
```

   Difference in answers = 470340 – 405216
   = 65,124

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

```
      18
215 ) 4000
    – 215
     1850
    –1720
      130
```

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

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

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

Therefore, 177 boxes can be loaded.

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.

12. Capacity of curd in a vessel = 4 liters 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.

Class –VI Mathematics (Ex. 1.3)
Questions

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

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

3. Estimate the following products using general rule:
   (a) 578 x 161
   (b) 5281 x 3491
   (c) 1291 x 592
   (d) 9250 x 29

Class –VI Mathematics (Ex. 1.3)

Answers

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

28292 round off to 28000
21496 round off to 21000
Estimated difference= 7000

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

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 9000
29 round off to 30
The estimated product = 9,000 x 30 = 2,70,000

Ch.2 Whole Numbers

Class –VI Mathematics (Ex. 2.1)
Questions

1. Write the next three natural numbers after 10999.
2. Write the three whole numbers occurring just before 10001.
3. Which is the smallest whole number?
4. How many whole numbers are there between 32 and 53?
5. Write the successor of:
   (a) 2440701 (b) 100199 (c) 1099999 (d) 2345670
6. Write the predecessor of:
   (a) 94 (b) 10000 (c) 208090 (d) 7654321
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
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.

Class –VI Mathematics (Ex. 2.1)

Answers

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

2. 10,001 – 1 = 10,000
   10,000 – 1 = 9,999
   9,999 – 1 = 9,998

3. '0' (zero) is the smallest whole number.

4. 53 – 32 – 1 = 20
   There are 20 whole numbers between 32 and 53.

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

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

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.

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

Class –VI Mathematics (Ex. 2.2)
Questions

1. Find the sum by suitable rearrangement:
   (a) 837 + 208 + 363 (b) 1962 + 453 + 1538 + 647
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
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
4. Find the product using suitable properties:
   (a) 738 x 103 (b) 854 x 102
   (c) 258 x 1008 (d) 1005 x 168
5. A taxi-driver, filled his car petrol tank with 40 liters of petrol on Monday. The next day, he filled the tank with 50 liters of petrol. If the petrol costs ₹ 44 per liter, how much did he spend in all on petrol?
6. A vendor supplies 32 liters of milk to a hotel in a morning and 68 liters of milk in the evening. If the milk costs ₹ 15 per liter, how much money is due to the vendor per day?
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

Class –VI Mathematics (Ex. 2.2)

Answers

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

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

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

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

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

(d) 1005 x 168
= (1000 + 5) x 168
= 1000 x 168 + 5 x 168

= 258000 + 2064 = 168000 + 840

= 260064 = 168840

5. Petrol filled on Monday = 40 liters

Petrol filled on next day = 50 liters

Total petrol filled = 90 liters

Now, Cost of 1 liter petrol = ₹ 44

Cost of 90 liters petrol = 44 x 90

= 44 x (100 – 10)

= 44 x 100 – 44 x 10

= 4400 – 440

= ₹ 3960

Therefore, he spent ₹ 3960 on petrol.

6. Supply of milk in morning = 32 liters

Supply of milk in evening = 68 liters

Total supply = 32 + 68 = 100 liters

Now Cost of 1 liter milk = ₹ 15

Cost of 100 liters milk = 15 x 100 = ₹ 1500

Therefore, ₹ 1500 is due to the vendor per day.

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

Class –VI Mathematics (Ex. 2.3)
Questions

1. Which of the following will not represent zero:
   (a) 1 + 0 (b) 0 x 0
   (c) $\frac{0}{2}$ (d) $\frac{10-10}{2}$
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.
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.
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
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?

Class –VI Mathematics (Ex. 2.3)

Answers

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

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

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 x 5
   = 427500 + 85500 + 21375
   = 534375

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

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

CHAPTER 8. DECIMALS

Class –VI Mathematics (Ex. 8.1)
Answers

1. Sol.

Hundreds (100)	**Tens (10)**	**Ones (1)**	**Tenths** $\left(\frac{1}{10}\right)$
0	3	2	31.2
1	1	4	110.4

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

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

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) $\frac{2}{5}=\frac{\quad}{5\times2}=\frac{\quad}{10}$ = 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) $3\frac{1}{5}=3+\frac{1}{5}=3+\frac{\quad}{5\times2}=3+\frac{\quad}{10}$ = 3 + 0.6 = 3.6

(k) $4\frac{\quad}{2}=4+\frac{\quad}{2}=4+\frac{\quad}{2\times5}=4+\frac{\quad}{10}$ = 4 + 0.5 = 4.5

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 = $\frac{\cancel{64}}{\cancel{10}}=\frac{32}{5}$

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 = 1 cm]

4 + 0.2 = 4.2 cm

(e) ∵ 10 mm = 1 cm

$\therefore$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 162 mm = $\frac{1}{10}$ x 162 = 16.2 cm

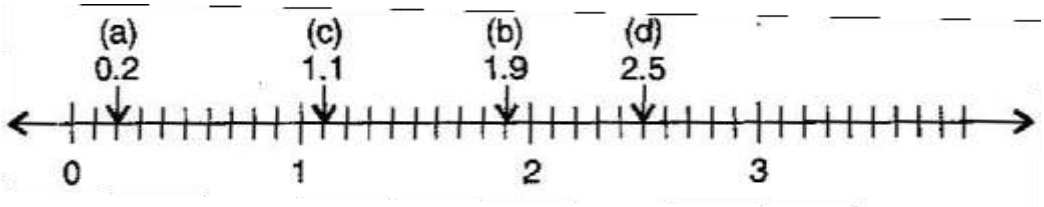
(f) ∵ 10 mm = 1 cm

$\therefore$ 1 mm = $\frac{1}{10}$ cm

$\therefore$ 83 mm = $\frac{1}{10}$ x 83 = 8.3 cm

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.

8. Sol.



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

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

Class –VI Mathematics (Ex. 8.2)

Answers

1. Sol.

	Ones	Tenths	Hundredths	Numbers
(a)	0	2	6	0.26
(b)	1	3	8	1.38
(c)	1	2	8	1.28

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) $0 \times 100 + 1 \times 10 + 2 \times 1 + 2 \times \frac{1}{10} + 4 \times \frac{1}{100} + 1 \times \frac{1}{1000}$

$0 + 10 + 2 + 0.2 + 0.04 + 0.001 = 12.241$

3. Sol.

	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

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

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
Five point zero zero eight

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.

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) $0.066 = \frac{\cancel{66}}{\cancel{1000}} = \frac{33}{500}$

Class –VI Mathematics (Ex. 8.3)

Answers

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 $5.603 \Rightarrow 5.640 > 5.603$

2. Before comparing, we write both terms in like decimals
   (i) 1.80 or $1.82 \Rightarrow$ 1.82 is greater than 1.8
   (ii) 1.0009 or $1.0900 \Rightarrow$ 1.09 is greater than 1.0009
   (iii) 10.01 or $100.10 \Rightarrow$ 100.1 is greater than 10.01
   (iv) 5.1000 or $5.0100 \Rightarrow$ 5.100 is greater than 5.0100
   (v) 04.213 or $0421.300 \Rightarrow$ 0421.3 is greater than 04.213

Class –VI Mathematics (Ex. 8.4)

Answers

1. (a) ∵ 1 paisa = ` $\frac{1}{100}$

∴ 5 paisa = $\frac{1}{100}$ x 5 = ` 0.05

(b) ∵ 1 paisa = ` $\frac{1}{100}$

∴ 75 paisa = $\frac{1}{100}$ x 5 = ` 0.75

(c) ∵ 1 paisa = ` $\frac{1}{100}$

∴ 20 paisa = $\frac{1}{100}$ x 5 = ` 0.05

(d) ∵ 1 paisa = ` $\frac{1}{100}$

∴ ` 50 + 90 paisa = 50 + $\frac{1}{100}$ x 90 = ` 50.90

(e) ∵ 1 paisa = ` $\frac{1}{100}$

∴ 725 paisa = $\frac{1}{100}$ x 725 = $\frac{725}{100}$ = ` 7.25

2. (a) ∵ 1 cm = $\frac{1}{100}$ m

∴ 15 cm = $\frac{1}{100}$ x 15 = 0.15 m

(b) ∵ 1 cm = $\frac{1}{100}$ m

∴ 6 cm = $\frac{1}{100}$ x 6 = 0.06 m

(c) ∵ 1 cm = $\frac{1}{100}$ m

∴ 2 m 45 cm = 2 + $\frac{1}{100}$ x 45 = 2.45 m

(d) ∵ 1 cm = $\frac{1}{100}$ m

∴ 9 m 7 cm = 9 + $\frac{1}{100}$ x 7 = 9.07 m

(e) ∵ 1 cm = $\frac{1}{100}$ m

∴ 419 cm = $\frac{1}{100}$ x 419 = $\frac{419}{100}$ = 4.19 m

3. (a) ∵ 1 mm = $\frac{1}{10}$ cm

∴ 5 mm = $\frac{1}{10}$ x 5 = 0.5 cm

(b) ∵ 1 mm = $\frac{1}{10}$ cm

∴ 60 mm = $\frac{1}{10}$ x 60 = 6 cm

(c) ∵ 1 mm = $\frac{1}{10}$ cm

∴ 164 mm = $\frac{1}{10}$ x 164 = 16.4 cm

(d) ∵ 1 mm = $\frac{1}{10}$cm

∴ 9 cm 8 mm = 9 + $\frac{1}{10}$ x 8 = 9 + 0.8 = 9.8 cm

(e) ∵ 1 mm = $\frac{1}{10}$cm

$\therefore$ 93 mm = $\frac{1}{10}$ x 93 = 9.3 cm

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 5 m = 70 + $\frac{1}{1000}$ x 5 = 70.005 km

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

Class –VI Mathematics (Ex. 8.5)

Answers

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

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.

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, total money received by Radha is ` 26.30.

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, total length of cloth bought by Nasreen is 5.25 m

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, total distance travelled by Naresh is 3.042 km.

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.

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 total weight of Ravi's purchase = 18.270

Class –VI Mathematics (Ex. 8.6)

Answers

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

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

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.

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.

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
Thereofre, 15.55 m of cloth is left with Tina.

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.

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, weight of potatoes is 4.425 kg.

Chapter 8 : Decimals

MIND MAP

This chapter consists of four different topics. The most probable questions from the examination point of view are given below.

TYPE: 1

Q1. Write two tens and seven tenths as decimal.

Q2. Write 0.25 as fraction in lowest form.

Q3. Write $3\frac{6}{5}$ as decimal.

Q4. Compare 3.126 and 3.90, which one is smaller.

TYPE: 2

Q1. Express 34 cm as m using decimals.

Q2. Express 4 kg 30 g as kg using decimals.

Q3. Express 15 rupee 25 paise as rupee using decimals.

Q4. Show the number 1.9 on a number line.

TYPE: 3

Q1. Find the sum of 1.12, 2.3, 3 and 2.23

Q2. Solve: 8.34 + 2.21 + 9.0 + 54

Q3. Subtract 81.77 from 9.2

Q4. Find the value of: 63.78 – 1.431

TYPE: 4

Q1. Sunita travelled 16 km 28 m by bus, 7 Km 12 m by car and remaining 12 Km on footto reach her school. How far is her school from her residence?

Q2. Arnav spent ₹ 7.89 for buying a pen and ₹ 3.21 for one pencil. How much money did he spend?

Q3. Ravi has ₹ 122.30 with him, he spent ₹ 11.40. How much money is left with him?

TYPE: 5 (ACHIEVER'S SECTION)

Q1. Subtract the sum of 4.5 and 5.3 from 11.

Q2. Subtract the difference of 2.5 and 1.31 from their sum.

Q3. What should be added to the sum of 3.8 and 1.53 to get 7?

Q4. What should be subtracted from the sum of 17.32 and 18.009 to get 30.9?

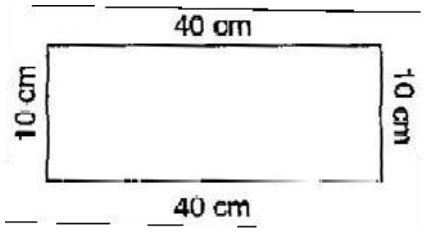
Q5. An oil tankers contains 275.5 liters of oil. The oil was transferred in 19 tins. If each tin contains same quantity of oil, find the quantity of oil in each tin?

Class 6 Maths Ch 10. Mensuration

Class –VI Mathematics (Ex. 10.1)
Answers

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
(c) Perimeter = Sum of all the sides
= 15 cm + 15 cm + 15 cm + 15 cm = 60 cm
(d) Perimeter = Sum of all the sides
= 4 cm + 4 cm + 4 cm + 4 cm + 4 cm = 20 cm
(e) 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
(f) 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

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.

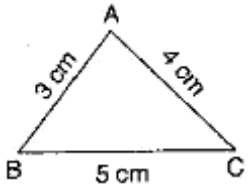
3. Length of table top = 2 m 25 cm = 2.25 m
Breadth of table top = 1 m 50 cm = 1.50 m
Perimeter of table top = 2 x (length + breadth)
= 2 x (2.25 + 1.50)
= 2 x 3.75 = 7.50 m
Thus, perimeter of table top is 7.5 m.

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.

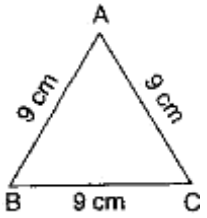
5. Since the 4 rows of wires are needed. Therefore the total length of wires is equal to 4 times the perimeter of rectangle.

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 m

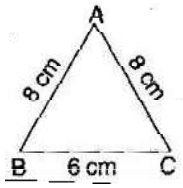
6. (a) Perimeter of ΔABC = AB + BC + CA
= 3 cm + 5 cm = 4 cm
= 12 cm



(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



7. Perimeter of triangle = Sum of all three sides
= 10 cm + 14 cm + 15 cm
= 39 cm
Thus, perimeter of triangle is 39 cm.

8. Perimeter of Hexagon = 6 x length of one side
= 6 x 8 m
= 48 m
Thus, the perimeter of hexagon is 48 m.

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.

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.

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.

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.

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, cost of fencing of 1000 meters = 20 x 1000 = = ` 20,000

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, cost of fencing park per meter = = ` 12
Therefore, cost of fencing park of 600 m = 12 x 600 = = ` 7,200

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.

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.

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.

Class –VI Mathematics (Ex. 10.2)

Answers

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

(e) Number of filled squares = 10

∴ Area covered by filled squares = 10 x 1 = 10 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 = 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

(h) Number of filled squares = 5

∴ Area covered by filled squares = 5 x 1 = 5 sq. units

(i) Number of filled squares = 9

∴ Area covered by filled squares = 9 x 1 = 9 sq. units

(j) 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 = $\cancel{4}^{2}$ x $\frac{1}{\cancel{2}_{1}}$ = 2 sq. units

∴ Total area = 2 + 2 = 4 sq. units

(k) 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 = $\cancel{2}^{1}$ x $\frac{1}{\cancel{2}_{1}}$ = 1 sq. units

∴ Total area = 4 + 1 = 5 sq. units

(l) 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 = $\cancel{10}^{5}$ x $\frac{1}{\cancel{2}_{1}}$ = 5 sq. units

∴ Total area = 3 + 5 = 8 sq. units

(m) 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 = $\cancel{14}^{7}$ x $\frac{1}{\cancel{2}_{1}}$ = 7 sq. units

∴ Total area = 7 + 7 = 14 sq. units

(n) 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 = $\cancel{16}^{8}$ x $\frac{1}{\cancel{2}_{1}}$ = 8 sq. units

∴ Total area = 10 + 8 = 18 sq. units

Class –VI Mathematics (Ex. 10.3)

Answers

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

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

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, i.e. 56 m^2 and rectangle (b) has smallest area, i.e., 56 m^2.

4. Length of rectangle = 50 m and Area of rectangle = 300 m^2
   Since, Area of rectangle = length x breadth
   Therefore, Breadth = $\frac{\text{Area of rectangle}}{\text{Length}} = \frac{\cancel{300}}{\cancel{50}}$ = 6 m
   Thus, the breadth of the garden is 6 m.

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 = $\frac{8\times1000\cancel{00}}{1\cancel{00}}$ = ` 8000

6. Length of table = 2 m and 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

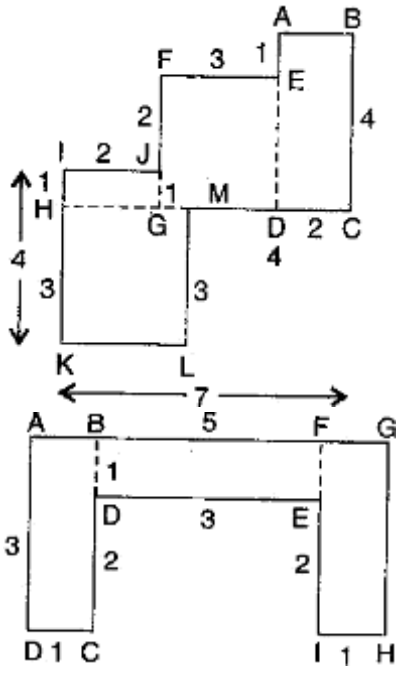
7. Length of room = 4 m and breadth of room = 3 m 50 cm = 3.50 m

Area of carpet = length x breadth
= 4 x 3.50 = 14m^2

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

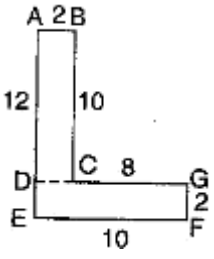
9. Side of square bed = 1 m
Area of square bed = side x side = 1 m x 1 m = 1 m^2
∴ Area of 5 square beds = 1 x 5 = 5 m^2
Now, Length of land = 5 m and breadth of land = 4 m
∴ Area of land = length x breadth = 5 m x 4 m = 20 m^2
Area of remaining part = Area of land – Area of 5 flower beds
= 20 m^2 – 5 m^2 = 15 m^2

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

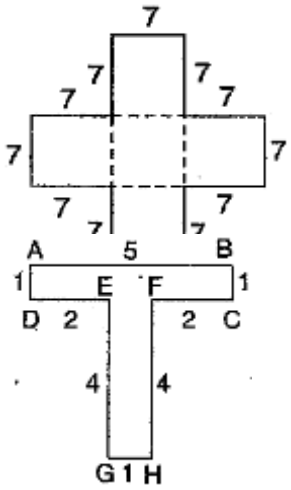


(b) Area of ABCD = 3 x 1 = 3 cm^2
Area of BDEF = 3 x 1 = 3 cm^2
Area of FGHI = 3 x 1 = 3 cm^2
Total area of the figure = 3 + 3 + 3 = 9 cm^2

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

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.

Chapter 10 : Mensuration

MIND MAP

This chapter consists of four different topics. The most probable questions from the examination point of view are given below.

TYPE: 1

Q.1. Find the perimeter of the given figure.

Q.2 A table top measures 3 m 12 cm by 1 m 31 m is sealed all round with tape. What length of tape required?

Q.3 Find the perimeter of a square of side 14 cm.

Q.4 Find the perimeter of a regular hexagon of side 4 m.

Q.5 Find the perimeter of an isosceles triangle whose equal sides are of 14 m 10 cm and third side is of 11 cm.

Q.6 Find the perimeter of a triangle of sides are 7 cm, 6 cm and 9 cm.

TYPE: 2

Q.1. Find the area of the given figure.

Q.2. Find the area of a rectangle of side 3m 12cm.

Q.3. Find the area of a square of side 8 cm.

Q4. Find the area of a regular pentagon of side 6 cm.

TYPE: 3

Q.1. The area of a rectangular garden 25m long is 550 sq. m. find the width of the garden.

Q.2. The perimeter of a square table is 32 sq. m. find its side and area.

Q.3. A rectangular garden is of perimeter 320 m and length 16 m. find its breadth.

TYPE: 4

Q1. A room is 5 m long and 4 m wide. A square carpet of sides 1.2 m is laid on the floor.

(a) Find the area covered by the carpet.
(b) Find the area of the floor.
(c) Find the area of the floor which is not carpeted.
(d) How many square metres of carpet is required to cover the floor of the room.

Q2. What is the cost of tiling a rectangular plot of land 240 m long and 14 m 20 cm wide at the rate of ₹4.5 per m?

ACHIEVERS SECTION

Q1. A wire is in the shape of a rectangle. Its length is 40 cm and breadth is 22 cm. If the same wire is bent in the shape of a square, what will be the measure of each side? Also, find which side encloses more area?

Q2. How many square metres of glass will be required for a window, which has 12 panes, each pane measuring 25 cm by 16 cm?

Q3**. A room is 9.68 m long and 6.2 m wide. Its floor is covered with rectangular tiles of** size **22 cm by 10 cm. Find the total cost of the tiles at the rate of Rs 2.50 per tile.**

Q4. **A corridor of a school is 8 m long and 6 m wide. It is to be covered with canvas sheets. If the available canvas sheets have the size 2 m x 1 m, find the cost of canvas sheets require**