Solved Paper–4

Class 9th, Mathematics, SA–2

Time: 3hours **Max. Marks 90**

General Instructions

1. All questions are compulsory.
2. Draw neat labeled diagram wherever necessary to explain your answer.
3. Q.No. 1 to 8 are of objective type questions, carrying 1 mark each.
4. Q.No.9 to 14 are of short answer type questions, carrying 2 marks each.
5. Q. No. 15 to 24 carry 3 marks each. Q. No. 25 to 34 carry 4 marks each.

1. Point (– 10, 0) lies
   (A) on the negative direction of the x-axis
   (B) on the negative direction of the y-axis
   (C) in the third quadrant
   (D) in the fourth quadrant

2. In Δ ABC, AB = AC and ∠B = 50°. Then ∠C is equal to
   (A) 40° (B) 50°
   (C) 80° (D) 130°

3. ABCD is a cyclic quadrilateral such that AB is a diameter of the circle circumscribing it and ∠ADC = 140º, then ∠BAC is equal to:
   (A) 80º (B) 50º
   (C) 40º (D) 30º

4. The linear equation 2x – 5y = 7 has
   (A) A unique solution (B) Two solutions
   (C) Infinitely many solutions (D) No solution

5. The class-mark of the class 130-150 is :
   (A) 130 (B) 135
   (C) 140 (D) 145

6. The radii of two cylinders are in the ratio of 2:3 and their heights are in the ratio of 5:3. The ratio of their volumes is:
   (A) 10 : 17 (B) 20 : 27
   (C) 17 : 27 (D) 20 : 37

7. Two coins are tossed 1000 times and the outcomes are recorded as below :

Number of heads	2	1	0
Frequency	200	550	250

Based on this information, the probability for at most one head is

(A)/15 (B)1/4

(C)4/5 (D)3/4

8. In a cylinder, radius is doubled and height is halved, curved surface area will be

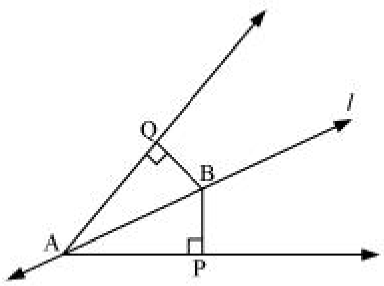
(A) halved (B) doubled

(C) same (D) four times

9. Line *l* is the bisector of an angle ∠A and B is any point on *l*. BP and BQ are perpendiculars from B to the arms of ∠A (see the given figure). Show that:

(i) ΔAPB ≅ ΔAQB

(ii) BP = BQ or B is equidistant from the arms of ∠A.



10. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients? $\left[\text{Assume } \pi = \frac{22}{7}\right]$

11. The blood groups of 30 students of Class VIII are recoded as follows:

A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O,

A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O.

Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest, blood group among these students?

12.

Blood group	Number of students
A	9
B	6
AB	3
O	12
Total	30

The above frequency distribution table represents the blood groups of 30 students of a class. Use this table to determine the probability that a student of this class, selected at random, has blood group AB.

13. Two chords AB and CD of lengths 5 cm 11cm respectively of a circle are parallel to each other and are on opposite sides of its centre. If the distance between AB and CD is 6 cm, find the radius of the circle.

14. A study was conducted to find out the concentration of sulphur dioxide in the air in parts per million (ppm) of a certain city. The data obtained for 30 days is as follows:

0.03	0.08	0.08	0.09	0.04	0.17
0.16	0.05	0.02	0.06	0.18	0.20
0.11	0.08	0.12	0.13	0.22	0.07
0.08	0.01	0.10	0.06	0.09	0.18
0.11	0.07	0.05	0.07	0.01	0.04

(i) Make a grouped frequency distribution table for this data with class intervals as 0.00 - 0.04, 0.04 - 0.08, and so on.
(ii) For how many days, was the concentration of sulphur dioxide more than 0.11 parts per million?

15. Find the value of k, if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = k$.

16. The angles of quadrilateral are in the ratio 3: 5: 9: 13. Find all the angles of the quadrilateral.

17. Construct a triangle ABC in which BC = 8 cm, $\angle B = 45°$ and $AB - AC = 3.5$ cm.

18. If the volume of a right circular cone of height 9 cm is 48π cm^3, find the diameter of its base.

19. A company manufactures car batteries of a particular type. The lives (in years) of 40 such batteries were recorded as follows:

2.6	3.0	3.7	3.2	2.2	4.1	3.5	4.5
3.5	2.3	3.2	3.4	3.8	3.2	4.6	3.7
2.5	4.4	3.4	3.3	2.9	3.0	4.3	2.8
3.5	3.2	3.9	3.2	3.2	3.1	3.7	3.4
4.6	3.8	3.2	2.6	3.5	4.2	2.9	3.6

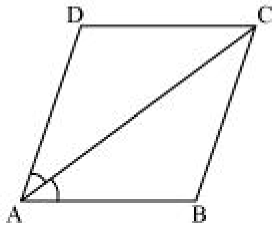
Construct a grouped frequency distribution table for this data, using class intervals of size 0.5 starting from the intervals 2 − 2.5.

20. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is
(i) 2 units (ii) 0 units

21. If the triangle ABC in the Question 7 above is revolved about the side 5 cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids obtained in Questions 7 and 8.

22. ABCD is a rhombus. Show that diagonal AC bisects ∠A as well as ∠C and diagonal BD bisects ∠B as well as ∠D.

23. Diagonal AC of a parallelogram ABCD bisects ∠A (see the given figure). Show that
(i) It bisects ∠C also,
(ii) ABCD is a rhombus.

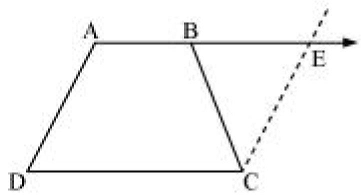


24. The length of 40 leaves of a plant are measured correct to one millimetre, and the obtained data is represented in the following table:

Length (in mm)	**Number of leaves**
118 − 126	3
127 − 135	5
136 − 144	9
145 − 153	12
154 − 162	5
163 − 171	4
172 − 180	2

(i) Draw a histogram to represent the given data.
(ii) Is there any other suitable graphical representation for the same data?
(iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

25. ABCD is a trapezium in which AB || CD and AD = BC (see the given figure). Show that



(i) ∠A = ∠B
(ii) ∠C = ∠D
(iii) ΔABC ≅ ΔBAD
(iv) diagonal AC = diagonal BD

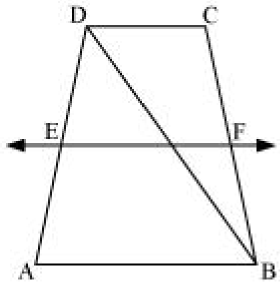
26. Construct a triangle ABC in which BC = 7 cm, ∠B = 75° and AB + AC = 13 cm.

27. Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y.) Draw the graph of the same.

28. The diameter of a metallic ball is 4.2 cm. What is the mass of the ball, if the density of the metal is 8.9 g per cm^3? $\left[\text{Assume } \pi = \frac{22}{7}\right]$

29. The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, what is the distance of the other chord from the centre?

30. ABCD is a trapezium in which AB || DC, BD is a diagonal and E is the mid - point of AD. A line is drawn through E parallel to AB intersecting BC at F (see the given figure). Show that F is the mid-point of BC.



31. A random survey of the number of children of various age groups playing in park was found as follows:

Age (in years)	**Number of children**
1 − 2	5
2 − 3	3
3 − 5	6
5 − 7	12
7 − 10	9
10 − 15	10
15 − 17	4

Draw a histogram to represent the data above.

32. AC and BD are chords of a circle which bisect each other. Prove that (i) AC and BD are diameters; (ii) ABCD is a rectangle.

33. Find the volume of a sphere whose surface area is 154 cm^2. $\left[\text{Assume } \pi = \frac{22}{7}\right]$

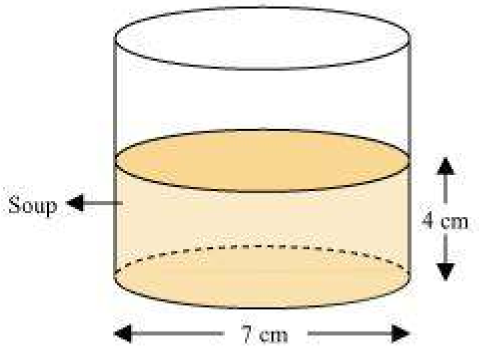
34. The following observations have been arranged in ascending order. If the median of the data is 63, find the value of *x*.
29, 32, 48, 50, *x*, *x* + 2, 72, 78, 84, 95

Solutions

1. A
2. B
3. C
4. C
5. C
6. B
7. D
8. B

9. In ΔAPB and ΔAQB,
∠APB = ∠AQB (Each 90º)
∠PAB = ∠QAB (*l* is the angle bisector of ∠A)
AB = AB (Common)
∴ ΔAPB ≅ ΔAQB (By AAS congruence rule)
∴ BP = BQ (By CPCT)
Or, it can be said that B is equidistant from the arms of ∠A.

10.



Radius (r) of cylindrical bowl = $\left(\frac{7}{2}\right)$ cm = 3.5 cm

Height (h) of bowl, up to which bowl is filled with soup = 4 cm

Volume of soup in 1 bowl = $\pi r^2 h$

$= \left(\frac{22}{7} \times (3.5)^2 \times 4\right)$ cm^3

= (11 × 3.5 × 4) cm^3

= 154 cm^3

Volume of soup given to 250 patients = (250 × 154) cm^3
= 38500 cm^3
= 38.5 litres.

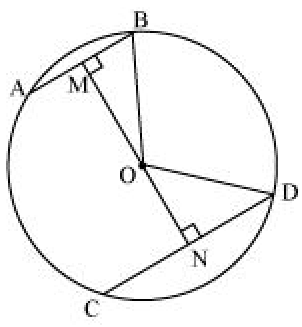
11. It can be observed that 9 students have their blood group as A, 6 as B, 3 as AB, and 12 as O.
Therefore, the blood group of 30 students of the class can be represented as follows.

Blood group	**Number of students**
A	9
B	6
AB	3
O	12
Total	30

It can be observed clearly that the most common blood group and the rarest blood group among these students is O and AB respectively as 12 (maximum number of students) have their blood group as O, and 3 (minimum number of students) have their blood group as AB.

12. Number of students having blood group AB = 3
Total number of students = 30
Hence, required probability, $P = \frac{3}{30} = \frac{1}{10}$

13. Draw OM ⊥ AB and ON ⊥ CD. Join OB and OD.



$BM = \frac{AB}{2} = \frac{5}{2}$ (Perpendicular from the centre bisects the chord)

$ND = \frac{CD}{2} = \frac{11}{2}$

Let ON be *x*. Therefore, OM will be 6− *x*.

In ΔMOB,

$$OM^2 + MB^2 = OB^2$$

$$(6-x)^2 + \left(\frac{5}{2}\right)^2 = OB^2$$

$$36 + x^2 - 12x + \frac{25}{4} = OB^2 \qquad \ldots (1)$$

In ΔNOD,

$$ON^2 + ND^2 = OD^2$$

$$x^2 + \left(\frac{11}{2}\right)^2 = OD^2$$

$$x^2 + \frac{121}{4} = OD^2 \qquad \ldots (2)$$

We have OB = OD (Radii of the same circle)

Therefore, from equation (1) and (2),

$$36 + x^2 - 12x + \frac{25}{4} = x^2 + \frac{121}{4}$$

$$12x = 36 + \frac{25}{4} - \frac{121}{4}$$

$$= \frac{144 + 25 - 121}{4} \quad = \frac{48}{4} = 12$$

$$x = 1$$

From equation (2),

$$(1)^2 + \left(\frac{121}{4}\right) = OD^2$$

$$OD^2 = 1 + \frac{121}{4} = \frac{125}{4}$$

$$OD = \frac{5}{2}\sqrt{5}$$

Therefore, the radius of the circle is $\frac{5}{2}\sqrt{5}$ cm.

14. Taking class intervals as 0.00, −0.04, 0.04, −0.08, and so on, a grouped frequency table can be constructed as follows.

Concentration of SO_2 (in ppm)	**Number of days (frequency)**
0.00 − 0.04	4
0.04 − 0.08	9
0.08 − 0.12	9
0.12 − 0.16	2
0.16 − 0.20	4
0.20 − 0.24	2
Total	30

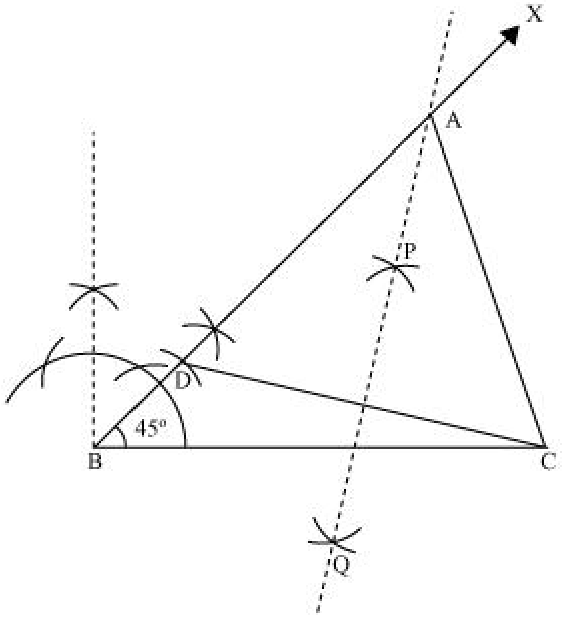
The number of days for which the concentration of SO_2 is more than 0.11 is the number of days for which the concentration is in between 0.12 − 0.16, 0.16 − 0.20, 0.20 − 0.24.
Required number of days = 2 + 4 + 2 = 8
Therefore, for 8 days, the concentration of SO_2 is more than 0.11 ppm.

15. Putting $x = 2$ and $y = 1$ in the given equation,
$2x + 3y = k$
$\Rightarrow 2(2) + 3(1) = k$
$\Rightarrow 4 + 3 = k$
$\Rightarrow k = 7$
Therefore, the value of k is 7.

16. Let the common ratio between the angles be x. Therefore, the angles will be $3x$, $5x$, $9x$, and $13x$ respectively.
As the sum of all interior angles of a quadrilateral is 360º,
$\therefore 3x + 5x + 9x + 13x = 360^\circ$
$30x = 360^\circ$
$x = 12^\circ$
Hence, the angles are
$3x = 3 \times 12 = 36^\circ$
$5x = 5 \times 12 = 60^\circ$

$9x = 9 \times 12 = 108^o$
$13x = 13 \times 12 = 156^o$

17. The below given steps will be followed to draw the required triangle.
Step I: Draw the line segment BC = 8 cm and at point B, make an angle of 45°, say ∠XBC.
Step II: Cut the line segment BD = 3.5 cm (equal to AB − AC) on ray BX.
Step III: Join DC and draw the perpendicular bisector PQ of DC.
Step IV: Let it intersect BX at point A. Join AC. ΔABC is the required triangle.



18. Height (h) of cone = 9 cm
Let the radius of the cone be r.
Volume of cone = 48π cm³

$$\Rightarrow \frac{1}{3}\pi r^2 h = 48\pi \text{ cm}^3$$

$$\Rightarrow \left(\frac{1}{3}\pi r^2 \times 9\right) \text{ cm} = 48\pi \text{ cm}^3$$

$$\Rightarrow r^2 = 16 \text{ cm}^2$$

$$\Rightarrow r = 4 \text{ cm}$$

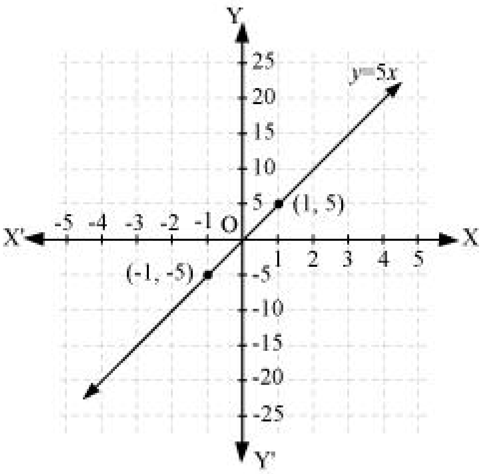
Diameter of base = $2r$ = 8 cm

19. A grouped frequency table of class size 0.5 has to be constructed, starting from class interval 2 − 2.5.

Therefore, the class intervals will be 2 − 2.5, 2.5 − 3, 3 − 3.5…
By observing the data given above, the required grouped frequency distribution table can be constructed as follows.

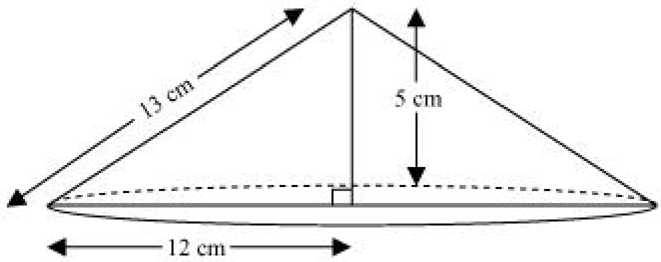
Lives of batteries (in hours)	**Number of batteries**
2 − 2.5	2
2.5 − 3.0	6
3.0 − 3.5	14
3.5− 4.0	11
4.0 − 4.5	4
4.5 − 5.0	3
Total	40

20. Let the distance travelled and the work done by the body be x and y respectively.
Work done ∝ distance travelled
$y \propto x$
$y = kx$
Where, k is a constant
If constant force is 5 units, then work done $y = 5x$
It can be observed that point (1, 5) and (−1, −5) satisfy the above equation. Therefore, these are the solutions of this equation. The graph of this equation is constructed as follows.



(i)From the graphs, it can be observed that the value of y corresponding to $x = 2$ is 10. This implies that the work done by the body is 10 units when the distance travelled by it is 2 units.
(ii) From the graphs, it can be observed that the value of y corresponding to $x = 0$ is 0. This implies that the work done by the body is 0 units when the distance travelled by it is 0 unit.

21.



When right-angled ΔABC is revolved about its side 5 cm, a cone will be formed having radius (r) as 12 cm, height (h) as 5 cm, and slant height (l) as 13 cm.

Volume of cone $= \frac{1}{3}\pi r^2 h$

$= \left[\frac{1}{3} \times \pi \times (12)^2 \times 5\right] \text{ cm}^3$

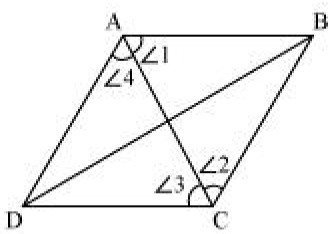
$= 240\pi \text{ cm}^3$

Therefore, the volume of the cone so formed is $240\pi \text{ cm}^3$.

Required ratio $= \frac{100\pi}{240\pi}$

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

22.



Let us join AC.
In ΔABC,
BC = AB (Sides of a rhombus are equal to each other)

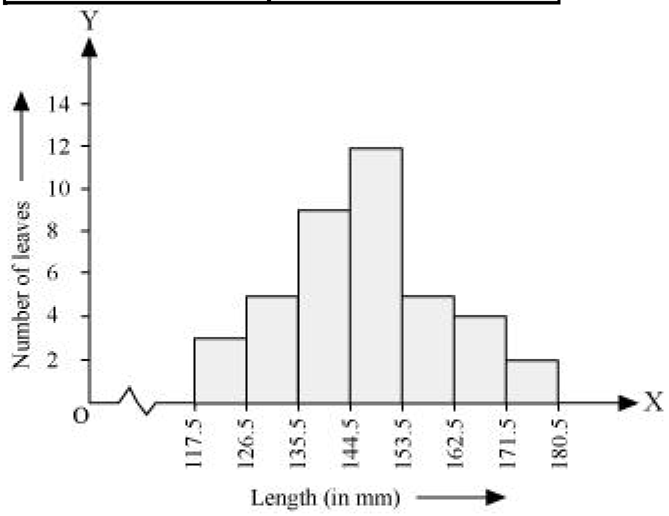
∴ ∠1 = ∠2 (Angles opposite to equal sides of a triangle are equal)
However, ∠1 = ∠3 (Alternate interior angles for parallel lines AB and CD)
⇒ ∠2 = ∠3
Therefore, AC bisects ∠C.
Also, ∠2 = ∠4 (Alternate interior angles for || lines BC and DA)
⇒ ∠1 = ∠4
Therefore, AC bisects ∠A.
Similarly, it can be proved that BD bisects ∠B and ∠D as well.

23. (i) ABCD is a parallelogram.
∴ ∠DAC = ∠BCA (Alternate interior angles) ... (1)
And, ∠BAC = ∠DCA (Alternate interior angles) ... (2)
However, it is given that AC bisects ∠A.
∴ ∠DAC = ∠BAC ... (3)
From equations (1), (2), and (3), we obtain
∠DAC = ∠BCA = ∠BAC = ∠DCA ... (4)
⇒ ∠DCA = ∠BCA
Hence, AC bisects ∠C.
(ii)From equation (4), we obtain
∠DAC = ∠DCA
∴ DA = DC (Side opposite to equal angles are equal)
However, DA = BC and AB = CD (Opposite sides of a parallelogram)
∴ AB = BC = CD = DA
Hence, ABCD is a rhombus.

24. (i) It can be observed that the length of leaves is represented in a discontinuous class interval having a difference of 1 in between them. Therefore, $\frac{1}{2} = 0.5$ has to be added to each upper class limit and also have to subtract 0.5 from the lower class limits so as to make the class intervals continuous.

Length (in mm)	**Number of leaves**
117.5 − 126.5	3
126.5 − 135.5	5

135.5 − 144.5	9
144.5 − 153.5	12
153.5 − 162.5	5
162.5 − 171.5	4
171.5 − 180.5	2



Taking the length of leaves on x-axis and the number of leaves on y-axis, the histogram of this information can be drawn as above.

Here, 1 unit on y-axis represents 2 leaves.

(ii) Other suitable graphical representation of this data is frequency polygon.

(iii) No, as maximum number of leaves (i.e., 12) has their length in between 144.5 mm and 153.5 mm. It is not necessary that all have their lengths as 153 mm.

25. Let us extend AB. Then, draw a line through C, which is parallel to AD, intersecting AE at point E. It is clear that AECD is a parallelogram.

(i) AD = CE (Opposite sides of parallelogram AECD)

However, AD = BC (Given)

Therefore, BC = CE

$\angle CEB = \angle CBE$ (Angle opposite to equal sides are also equal)

Consider parallel lines AD and CE. AE is the transversal line for them.

$\angle A + \angle CEB = 180^o$ (Angles on the same side of transversal)

$\angle A + \angle CBE = 180^o$ (Using the relation $\angle CEB = \angle CBE$) ... (1)

However, $\angle B + \angle CBE = 180^o$ (Linear pair angles) ... (2)

From equations (1) and (2), we obtain

∠A = ∠B

(ii) AB || CD

∠A + ∠D = 180º (Angles on the same side of the transversal)

Also, ∠C + ∠B = 180° (Angles on the same side of the transversal)

∴ ∠A + ∠D = ∠C + ∠B

However, ∠A = ∠B [Using the result obtained in (i)]

∴ ∠C = ∠D

(iii) In ΔABC and ΔBAD,

AB = BA (Common side)

BC = AD (Given)

∠B = ∠A (Proved before)

∴ ΔABC ≅ ΔBAD (SAS congruence rule)

(iv) We had observed that,

ΔABC ≅ ΔBAD

∴ AC = BD (By CPCT)

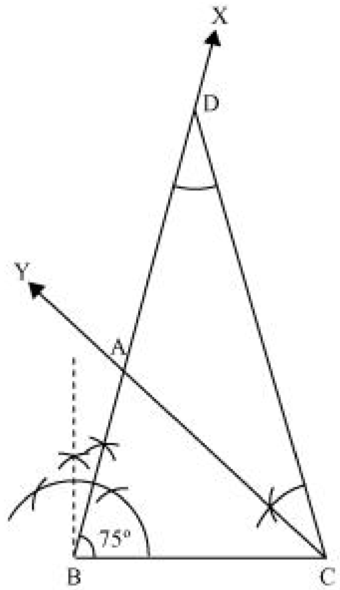
26. The below given steps will be followed to construct the required triangle.

Step I: Draw a line segment BC of 7 cm. At point B, draw an angle of 75°, say ∠XBC.

Step II: Cut a line segment BD = 13 cm (that is equal to AB + AC) from the ray BX.

Step III: Join DC and make an angle DCY equal to ∠BDC.

Step IV: Let CY intersect BX at A. ΔABC is the required triangle.

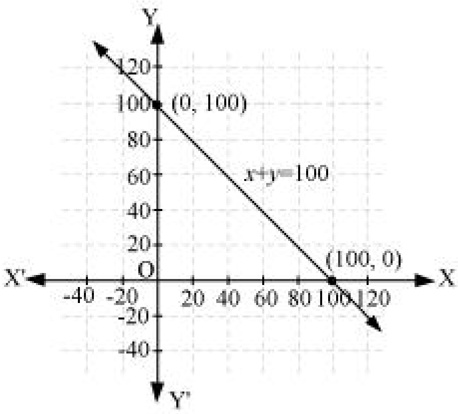


27. Let the amount that Yamini and Fatima contributed be x and y respectively towards the Prime Minister's Relief fund.

Amount contributed by Yamini + Amount contributed by Fatima = 100

$x + y = 100$

It can be observed that (100, 0) and (0, 100) satisfy the above equation. Therefore, these are the solutions of the above equation. The graph is constructed as follows.



Here, it can be seen that variable x and y are representing the amount contributed by Yamini and Fatima respectively and these quantities cannot be negative. Hence, only those values of$x$ and y which are lying in the 1[st] quadrant will be considered.

28. Radius (r) of metallic ball = $\left(\frac{4.2}{2}\right)$ cm = 2.1 cm

Volume of metallic ball = $\frac{4}{3}\pi r^3$

$= \left[\frac{4}{3}\times\frac{22}{7}\times(2.1)^3\right]$ cm^3

$= 38.808$ cm^3

Density = $\frac{\text{Mass}}{\text{Volume}}$

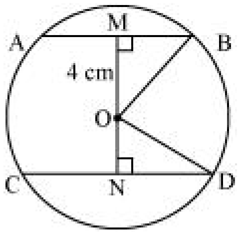
Mass = Density × Volume

= (8.9 × 38.808) g

= 345.3912 g

Hence, the mass of the ball is 345.39 g (approximately).

29.



Let AB and CD be two parallel chords in a circle centered at O. Join OB and OD.
Distance of smaller chord AB from the centre of the circle = 4 cm
OM = 4 cm

MB = $\frac{AB}{2} = \frac{6}{2} = 3\,\text{cm}$

In ΔOMB,

$OM^2 + MB^2 = OB^2$

$(4)^2 + (3)^2 = OB^2$

$16 + 9 = OB^2$

$OB = \sqrt{25}$

$OB = 5\,\text{cm}$

In ΔOND,

$OD = OB = 5\,\text{cm}$ (Radii of the same circle)

$ND = \frac{CD}{2} = \frac{8}{2} = 4\text{cm}$

$ON^2 + ND^2 = OD^2$

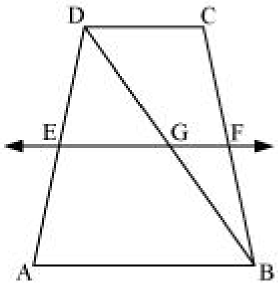
$ON^2 + (4)^2 = (5)^2$

$ON^2 = 25 - 16 = 9$

$ON = 3$

Therefore, the distance of the bigger chord from the centre is 3 cm.

30. Let EF intersect DB at G.



By converse of mid-point theorem, we know that a line drawn through the mid-point of any side of a triangle and parallel to another side, bisects the third side.

In ΔABD,

EF || AB and E is the mid-point of AD.

Therefore, G will be the mid-point of DB.

As EF || AB and AB || CD,

∴ EF || CD (Two lines parallel to the same line are parallel to each other)

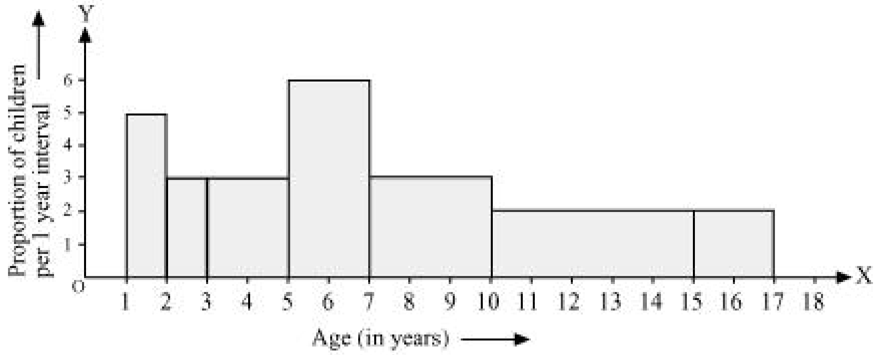
In ΔBCD, GF || CD and G is the mid-point of line BD. Therefore, by using converse of mid-point theorem, F is the mid-point of BC.

31. Here, it can be observed that the data has class intervals of varying width. The proportion of children per 1 year interval can be calculated as follows.

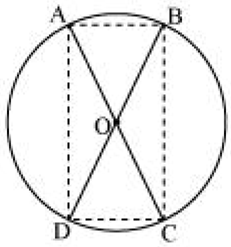
Age (in years)	**Frequency (Number of children)**	**Width of class**	**Length of rectangle**
1 − 2	5	1	$\frac{5\times1}{1}=5$
2 − 3	3	1	$\frac{3\times1}{1}=3$
3 − 5	6	2	$\frac{6\times1}{2}=3$
5 − 7	12	2	$\frac{12\times1}{2}=6$
7 − 10	9	3	$\frac{9\times1}{3}=3$
10 − 15	10	5	$\frac{10\times1}{5}=2$

15 − 17	4	2	$\frac{4\times 1}{2}=2$

Taking the age of children on *x*-axis and proportion of children per 1 year interval on *y*-axis, the histogram can be drawn as follows.



32.



Let two chords AB and CD are intersecting each other at point O.

In ΔAOB and ΔCOD,

OA = OC (Given)

OB = OD (Given)

∠AOB = ∠COD (Vertically opposite angles)

ΔAOB ≅ ΔCOD (SAS congruence rule)

AB = CD (By CPCT)

Similarly, it can be proved that ΔAOD ≅ ΔCOB

∴ AD = CB (By CPCT)

Since in quadrilateral ACBD, opposite sides are equal in length, ACBD is a parallelogram.

We know that opposite angles of a parallelogram are equal.

∴ ∠A = ∠C

However, ∠A + ∠C = 180° (ABCD is a cyclic quadrilateral)

⇒ ∠A + ∠A = 180°

⇒ 2 ∠A = 180°

$\Rightarrow \angle A = 90°$

As ACBD is a parallelogram and one of its interior angles is 90°, therefore, it is a rectangle.

$\angle A$ is the angle subtended by chord BD. And as $\angle A = 90°$, therefore, BD should be the diameter of the circle. Similarly, AC is the diameter of the circle.

33. Let radius of sphere be r.

Surface area of sphere = 154 cm^2

$\Rightarrow 4\pi r^2 = 154\ cm^2$

$$\Rightarrow r^2 = \left(\frac{154\times 7}{4\times 22}\right)\ cm^2$$

$$\Rightarrow r = \left(\frac{7}{2}\right)\ cm = 3.5\ cm$$

Volume of sphere = $\frac{4}{3}\pi r^3$

$$= \left[\frac{4}{3}\times\frac{22}{7}\times(3.5)^3\right]\ cm^3$$

$$= 179\frac{2}{3}\ cm^3$$

Therefore, the volume of the sphere is $179\frac{2}{3}$ cm^3.

34. It can be observed that the total number of observations in the given data is 10 (even number). Therefore, the median of this data will be the mean of $\frac{10}{2}$ i.e., 5^{th} and $\frac{10}{2}+1$ i.e., 6^{th}observation.

$$\text{Therefore, median of data} = \frac{5^{th}\text{ observation} + 6^{th}\text{ observation}}{2}$$

$$\Rightarrow 63 = \frac{x+x+2}{2}$$

$$\Rightarrow 63 = \frac{2x+2}{2}$$

$$\Rightarrow 63 = x+1$$

$$\Rightarrow x = 62$$