

CBSE
Class IX Mathematics
Term II
Sample Paper - 3

Time: 3½ hrs

Total Marks: 90

General Instructions:

- 1. All** questions are **compulsory**.
- The question paper consists of **34** questions divided into **four sections** A, B, C, and D. **Section A** comprises of **8** questions of 1 mark each, **Section B** comprises of **6** questions of 2 marks each, **Section C** comprises of **10** questions of 3 marks each and **Section D** comprises of **10** questions of 4 marks each.
- Question numbers **1 to 8** in **Section A** are multiple choice questions where you are to select **one** correct option out of the given four.
- There is no overall choice. However, internal choice has been provided in 2 questions of **three marks** each and **2** questions of **four marks** each. You have to attempt only one of the alternatives in all such questions.
- Use of calculator is **not** permitted.

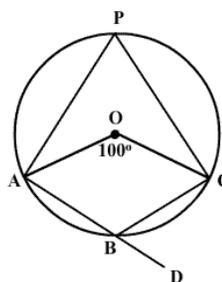
(SECTION – A)

- If the volume of a sphere is numerically equal to its surface area, then radius of the sphere is
(A) 1 unit
(B) 6 units
(C) 2 units
(D) 3 units
- If for one of the solutions of the equation $ax + by + c = 0$, x is negative and y is positive, then a portion of the above line definitely lies in the
(A) Ist Quadrant
(B) IInd Quadrant
(C) IIIrd Quadrant
(D) IVth Quadrant
- In quadrilateral PQRS, $PQ \parallel RS$ and $PS = QR = 7$ cm. If $m\angle P = 70^\circ$, find the measures of the other angles.
(A) $70^\circ, 110^\circ, 110^\circ$
(B) $70^\circ, 105^\circ, 115^\circ$
(C) $110^\circ, 105^\circ, 110^\circ$
(D) $70^\circ, 100^\circ, 120^\circ$
- Mode of data: 3, 2, 2, 2, 3, 5, 6, 6, 5, 3, 4, 2, and 5 is:
(A) 3
(B) 2

- (C) 5
(D) 6

5. If two cubes of side 5 cm each are joined end to end, then the volume of the cuboid so formed is
 (A) 255 cm^3
 (B) 500 cm^3
 (C) 250 cm^3
 (D) 225 cm^3

6. In the figure, O is the centre of the circle. $m\angle CBD =$
 (A) 45°
 (B) 50°
 (C) 55°
 (D) 60°



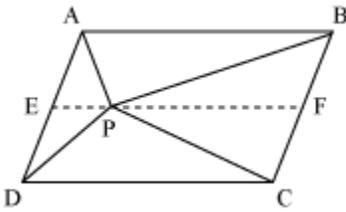
7. The area of a parallelogram whose base is 6 cm and the height is 3 cm is
 (A) 18 cm^2
 (B) 36 cm^2
 (C) 9 cm^2
 (D) 3 cm^2
8. In a triangle ABC if AD is the median, then what can be said about areas of triangles ABD and ADC.
 (A) Equal area
 (B) Unequal area
 (C) Each has one-third of the area of the triangle ABC
 (D) Each has one-fourth of the area of the triangle ABC

(SECTION – B)

9. Prove that a circle drawn with any side of a rhombus as diameter passes through the point of intersection of its diagonals.
10. It is required to make a closed cylindrical tank of height 1 m and base diameter 140 cm from a metal sheet. How many square metres of the sheet are required for the same?

11. In a cricket match, a batsman hits a boundary on 9 out the 45 balls he plays. Find the probability that he didn't hit a boundary.
12. Construct a right triangle whose base is 12 cm and the sum of its hypotenuse and other side is 18 cm.
13. In the given figure, P is a point in the interior of a parallelogram ABCD and EF is parallel to AB.

Show that $\text{Area} (\triangle APB) = \frac{1}{2} \text{Area} (\square ABFE)$



14. Find the value of a and b if $y = 1$ and $x = 2$ is solution of linear equation $ax + by = 3$ and $3a - 2b = 1$.

(SECTION – C)

15. If the diagonals of a cyclic quadrilateral are the diameters of a circle through the vertices of the quadrilateral, prove that it is a rectangle.
16. The students of a Vidyalaya were asked to participate in a competition for making and decorating penholders in the shape of a cylinder with a base, using cardboard. Each penholder was to be of radius 3 cm and height 10.5 cm. The Vidyalaya was to supply the competitors with cardboard. If there were 35 participants, how many square centimetres of cardboard must the organizers buy for the competition?
17. The following number of goals were scored by a team in a series of 10 matches:
2, 3, 4, 5, 0, 1, 3, 3, 4, and 3
Find the mean, median and mode of these scores.
18. Solve: $3 - (x - 5) = y + 2$, $2(x + y) = 4 - 3y$

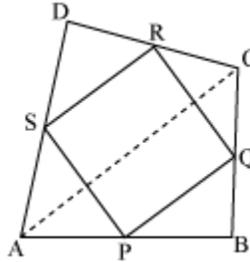
OR

The taxi fare in a city is as follows: For the first kilometer, the fares is Rs. 8 and for the remaining distance it is Rs. 5 per km. Taking the distance

covered as x km and total fare as Rs. y , write a linear equation for this information, and draw its graph.

19. A storehouse measures $40\text{ m} \times 25\text{ m} \times 10\text{ m}$. Find the maximum number of wooden crates each measuring $1.5\text{ m} \times 1.25\text{ m} \times 0.5\text{ m}$ that can be stored in the storehouse.

20. ABCD is a quadrilateral in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA (see the given figure). AC is a diagonal. Show that:

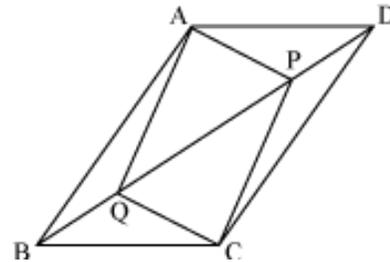


- i. $SR \parallel AC$ and $SR = \frac{1}{2} AC$
- ii. $PQ = SR$
- iii. PQRS is a parallelogram.

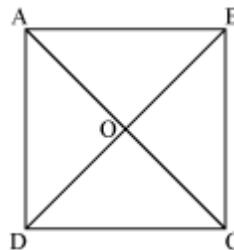
OR

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that $DP = BQ$ (see the given figure). Show that:

- i. $\triangle APD \cong \triangle CQB$
- ii. $AP = CQ$
- iii. $\triangle AQB \cong \triangle CPD$
- iv. $AQ = CP$



21. Show that the diagonals of a square are equal and bisect each other at right angles.



22. 1500 families with 2 children were selected randomly, and the following data was recorded:

Number of girls in a family	2	1	0
Number of families	475	814	211

Compute the probability of a family, chosen at random, having

- i. 2 girls
- ii. 1 girl
- iii. No girl

23. Prove that the angle subtended by an arc at the centre is double the angle subtended by it at any point on the remaining part of the circle.
24. Three unbiased coins are tossed together. Find the probability of getting
- i. Two heads
 - ii. At least two head
 - iii. No head

(SECTION – D)

25. Construct a triangle with base of 7.5 cm, the difference between the other two sides being 2.5 cm, and one base angle measuring 45° . Justify the Construction.

OR

Construct ΔPQR with base $PQ = 8.4$ cm, $m\angle P = 45^\circ$ and $PR - QR = 2.8$ cm.

26. Draw the graph of the linear equation $x + 2y = 8$. From the graph, check whether $(-1, -2)$ is a solution of this equation.

OR

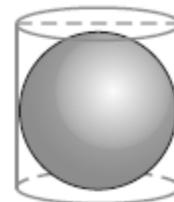
Write four solutions for the equation $nx + y = 9$.

27. Twenty seven iron spheres, each of radius r and surface area S are melted to form a sphere with surface area S' . Find the
- i. radius r' of the new sphere,
 - ii. ratio of S to S' .
28. In any ΔABC , if the angle bisector of $\angle A$ and perpendicular bisector of BC intersect, prove that they intersect on the circumcircle of ΔABC .
29. The following table shows the number of illiterate persons in the age group (10-58 years) in a town:

Age group (in years)	10-16	17-23	24-30	31-37	38-44	45-51	52-58
Number of illiterate persons	175	325	100	150	250	400	525

Draw a histogram to represent the above data.

30. A circus tent is cylindrical up to a height of 11 m and conical above it. If the diameter of the base is 24 m and the height of the cone is 5 m, find the length of the canvas required to make the tent if the width of the canvas is 5 m.
31. Let the vertex of $\angle ABC$ be located outside a circle and let the sides of the angle intersect the circle to make equal chords AD and CE. Prove that $\angle ABC$ is equal to half the difference of the angles subtended by the chords AC and DE at the centre.
32. A right circular cylinder just encloses a sphere of radius r . Find the
- Surface area of the sphere,
 - Curved surface area of the cylinder,
 - Ratio of the areas obtained in i. and ii.



33. The runs scored by two teams A and B in 7 overs in a cricket match are given.

Number of ball's	Team A	Team B
1-6	2	5
7-12	1	6
13-18	8	2
19-24	9	10
25-30	4	5
31-36	5	6
37-42	6	3

Represent the data of both the team's on the same graph by frequency polygon.

34. Construct a triangle XYZ in which angle Y is 30° , angle Z is 90° and $XY + YZ + ZX = 11$ cm.