Goa Board
Class IX Mathematics
Term II
Sample Paper - 8

Time: 3½ hrs **Total Marks: 90**

General Instructions:

1. **All** questions are **compulsory**.
2. 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.
3. 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.
4. There is no overall choice. However, internal choice has been provided in **1** question of **two marks**, **3** 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.
5. Use of calculator is **not** permitted.

(SECTION – A)

1. The lowest observation of a data is 24 and the highest is 56. The range of the given data is

(A) 16
(B) 32
(C) 40
(D) 35

2. An urn contains 10 red and 8 white balls. One ball is drawn at random. The probability that the ball drawn is white is

(A) $\frac{4}{9}$
(B) $\frac{5}{9}$
(C) $\frac{7}{9}$
(D) $\frac{2}{9}$

3. A cuboidal water tank is 6 m long, 5 m wide and 4.5 m deep. How many litres of water can it hold? (1 m^3 = 1000 l)
(A) 136000 litres
(B) 135000 litres
(C) 134500 litres
(D) 134000 litres

4. Three angles of a quadrilateral are 60°, 110° and 86°. The measure of the fourth angle of the quadrilateral is
(A) 104°
(B) 124°
(C) 126°
(D) 108°

5. A water storage tank has a cylindrical shape. If it is 2.1 m high and has a diameter of 1.4 m, its lateral surface area is
(A) 9.34 m^2
(B) 9.24 m^2
(C) 9.26 m^2
(D) 9. 25 m^2

6. A line l intersects two concentric circles at P, Q, R and S. Then
(A) PQ = RS
(B) PS·RS = PS ·PQ
(C) AS = PR
(D) PQ > RS

7. The equation 7x = 3 is written in two variables as
(A) 7x + y = 3
(B) 7xy = 3
(C) 7x = 3y
(D) 7x + 0y – 3 = 0

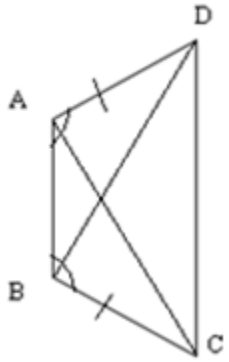
8. The graph of the equation y = −4 is a line
(A) parallel to the x-axis, at a distance of 4 units from the origin
(B) parallel to the x-axis, at a distance of 4 units from the origin and below the x-axis
(C) parallel to the y-axis, at a distance of 4 units from the origin to the left side of the y-axis
(D) which cuts an intercept of 8 units on both axes

(SECTION – B)

9. Two cubes of side 6 cm each are joined end to end. Find the surface area of the resultant cuboid.

10. Three unbiased coins are tossed together. Find probability of getting three heads.

11. In the given figure, ABCD is a quadrilateral in which AD = BC and ∠DAB = ∠CBA
Prove that (a) ΔABD ≅ ΔBAC (b) BD = AC



12. The following is the data of the average marks obtained by 20 students in all subjects:
36 39 40 48 53 52 50 51 43 40 33 49 54 47 45 52 45 44 32 53
Form a grouped discontinuous frequency distribution table such that one of the classes is 46-50.

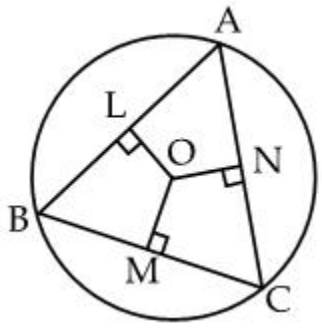
13. D, E and F are respectively the mid-points of the sides BC, CA and AB of ΔABC. Show that ar(BDEF) = $\frac{1}{2}$ ar(ABC).

14. What is the probability that a leap year has 53 Sundays?

(SECTION – C)

15. Draw a line segment of length 5.8 cm. Bisect it and measure the length of each part.

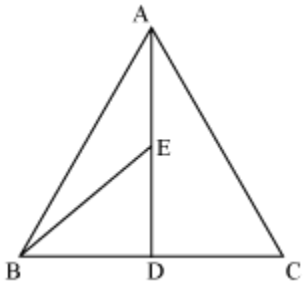
16. In the figure, O is the centre of the circle, OM $\perp$ BC, OL $\perp$ AB, ON $\perp$ AC and OM = ON = OL.



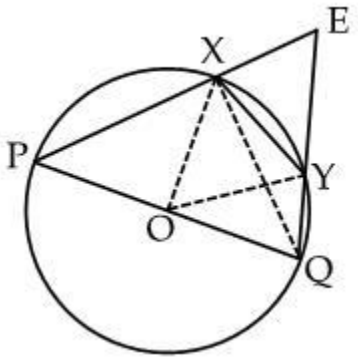
Is ΔABC equilateral? Give reasons.

17. When three coins are tossed simultaneously, find the probability of getting at least two tails.

18. In ΔABC, E is the mid-point of median AD. Show that area(BED) = $\frac{1}{4}$ area(ABC)



19. In the figure, PQ is the diameter of the circle and XY is chord equal to the radius of the circle. PX and QY when extended intersect at point E. Prove that m∠PEQ = 60°



20. The relative humidity (in %) of a certain city for a month of 30 days was as follows:

98.1	98.6	99.2	90.3	86.5	95.3	92.9	96.3	94.2	95.1
89.2	92.3	97.1	93.5	92.7	95.1	97.2	93.3	95.2	97.3
96.2	92.1	84.9	90.2	95.7	98.3	97.3	96.1	92.1	89

i. Construct a grouped frequency distribution table with classes 84 - 86, 86 - 88
ii. Which month or season do you think this data is about?
iii. What is the range of this data?

21. Two angles are complementary. The larger angle is 3° less than twice the measure of the smaller angle. Find the measure of each angle.

22. A cylinder and cone have bases of equal radii and are of equal heights. Show that their volumes are in the ratio of 3 : 1.

23. An algebra textbook has a total of 1382 pages. It is broken up into two parts. The second part of the book has 64 pages more than the first part. How many pages are there in each part of the book?

OR

Draw the graph of $y - 4x = 8$.

24. A solid is in the form of a right circular cylinder with a hemisphere at one end and a cone at the other end. The radius of the common base is 8 cm and the height of the cylindrical and conical portions are 10 cm and 6 cm respectively. Find the total surface area of the solid.

OR

A sphere, a cylinder and a cone have the same radius. Find the ratio of their curved surface areas.

(SECTION – D)

25. The taxi charges in Hyderabad include fixed charges as well a charge for the distance covered. For a distance of 10 km, the total charge paid is Rs. 220 and for a journey of 15 km the total charge paid is Rs. 310.
1. What are fixed charges and charge per km?
2. How much does a person have to pay for travelling a distance of 25 km?

26. Construct a right triangle whose base is 6 cm and the difference of its hypotenuse and the other side is 2 cm.

OR

Construct ΔABC in which BC = 4.5 cm, $m\angle B = 45°$ and AB – AC = 2.5 cm. Justify the construction.

27. Write four solutions for $\pi x + y = 9$.

28. The daily income of 50 doctors is given below:

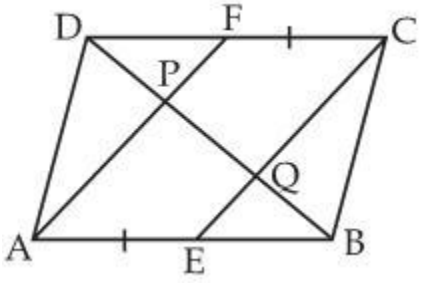
Daily income (in Rs.)	No. of Doctors
0 - 1000	8
1000 - 2000	7
2000 - 3000	12
3000 - 4000	6
4000 - 5000	11
5000 - 6000	6

Draw a histogram for the above data.

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

30. 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 competitors, how much cardboard was required to be bought for the competition?

31. In a parallelogram ABCD, E and F are the mid-points of sides AB and CD. Show that the line segment AF and CE trisect the diagonal BD.



OR

ABCD is a parallelogram. E is a point on BA such that BE = 2EA and F is a point on DC such that DF = 2FC. Prove that AECF is a parallelogram whose area is one third the area of parallelogram ABCD.

32. Formulate the following problem as a pair of equations and then find their solutions.
A boat goes 30 km upstream and 44 km downstream in 10 hours. In 13 hours it can go 40 km upstream and 55 km downstream. Determine the speed of the stream and that of the boat in still water.

33. Metallic spheres of radius 6 cm, 8 cm, and 10 cm respectively are melted to form a single solid sphere. Find the radius of the resulting sphere.

OR

The cost of painting the complete outside surface of a closed cylindrical oil tank at 60 paise per sq dm is Rs. 237.60. The height of the tank is 6 times the radius of the base of the tank. Find its volume corrected to two decimal places.

34. Two years later a father will be eight years more than three times the age of the son. Taking the present age of father and son as x and y respectively,
(a) Write a linear equation for the above and draw its graph.
(b) From the graph find the age of the father when the son's age is 10 years.