# Goa Board
# Class IX Mathematics
# Term II
# Sample Paper - 3

**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.** A cricket player scored 100, 50, 87, 147, 99, 90, 108, 14, 65, and 70 runs in 10 matches. The number of centuries scored by him is
(A) 5
(B) 3
(C) 0
(D) 1

**2.** 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

**3.** 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) I$^{st}$ Quadrant
(B) II$^{nd}$ Quadrant
(C) III$^{rd}$ Quadrant
(D) IV$^{th}$ Quadrant

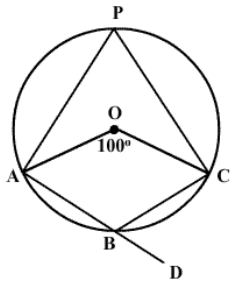
**4.** In quadrilateral PQRS, PQ ||RS and PS = QR = 7 cm. If m∠P = 70°, find the measures of the other angles.
(A) 70°, 110°, 110°
(B) 70°, 105°, 115°
(C) 110°, 105°, 110°
(D) 70°, 100°, 120°

**5.** 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

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

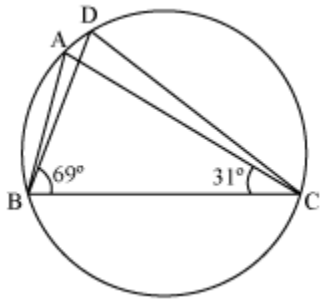
**7.** If two cubes of side 5 cm each are joined end to end, then the volume of the cuboid so formed is
(A) 255 $cm^3$
(B) 500 $cm^3$
(C) 250 $cm^3$
(D) 225 $cm^3$

**8.** In the figure, O is the centre of the circle. m∠CBD=
(A) 45°
(B) 50°
(C) 55°
(D) 60°



**(SECTION – B)**

**9.** In the given figure, m∠ABC = 69°, m∠ACB = 31°, find m∠BDC.




**10.** 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.

**11.** Prove that a circle drawn with any side of a rhombus as diameter passes through the point of intersection of its diagonals.

**12.** 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?

**13.** 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.

**14.** If the heights of 5 girls are 151 cm, 158 cm, 155 cm, 144 cm, and 152 cm respectively. Find the mean of their height.

**(SECTION – C)**

**15.** Name the quadrant in which the following points lie:
i. A(2, 2) ii. B(–3, –5) iii. C(2, –3)

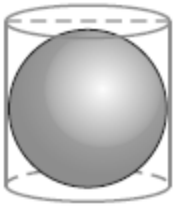
**16.** If the diagonals of a cyclic quadrilateral are the diameters of a circle through the vertices of the quadrilateral, prove that it is a rectangle.

**17.** Construct a right triangle whose base is 12 cm and the sum of its hypotenuse and other side is 18 cm.

**18.** 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 much cardboard must the organizers buy for the competition?

**OR**

A right circular cylinder just encloses a sphere of radius r. Find the



i. Surface area of the sphere,
ii. Curved surface area of the cylinder,
iii. Ratio of the areas obtained in i. and ii.

**19.** 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.

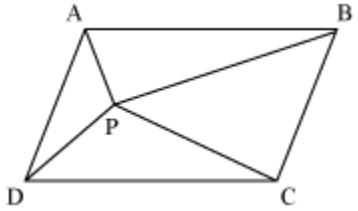
**20.** Solve: $3 - (x - 5) = y + 2$, $2(x + y) = 4 - 3y$

**OR**

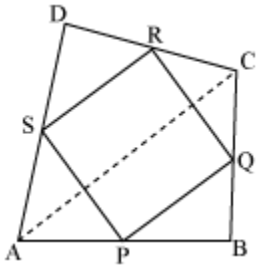
The taxi fare in a city is as follows: For the first kilometer, the fares is Rs. 8 and for the remaining distance it is Rs. 5 per km. Taking the distance covered as x km and total fare as Rs. y, write a linear equation for this information, and draw its graph.

**21.** A storehouse measures 40 m × 25 m × 10 m. Find the maximum number of wooden crates each measuring 1.5 m × 1.25 m × 0.5 m that can be stored in the storehouse.

**22.** In the given figure, P is a point in the interior of a parallelogram ABCD. Show that ar (APB) + ar (PCD) = $\frac{1}{2}$ ar (ABCD)




**23.** 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 || AC and SR = $\frac{1}{2}$ AC
ii. PQ = SR
iii. PQRS is a parallelogram.

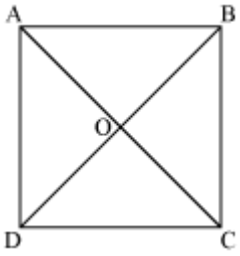
**24.** 1500 families with 2 children were selected randomly, and the following data was recorded:

| 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

**(SECTION – D)**

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




**26.** 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∠P = 45° and PR − QR = 2.8 cm.

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

**28.** 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'.

**29.** In any ΔABC, if the angle bisector of ∠A and perpendicular bisector of BC intersect, prove that they intersect on the circumcircle of ΔABC.

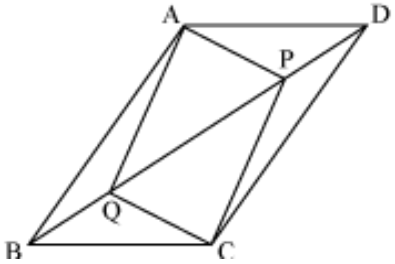
**30.** The following table shows the number of illiterate persons in the age group (10-58 years) in a town:

| 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.

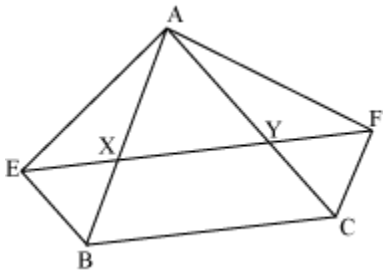
**31.** In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ (see the given figure). Show that:

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




**OR**

XY is a line parallel to side BC of a triangle ABC. If BE || AC and CF || AB meet XY at E and E respectively, show that ar (ABE) = ar (ACF).




**32.** A circus tent is cylindrical upto 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.

**33.** Write four solutions for the equation $\pi x + y = 9$.

**34.** 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.