Goa Board
Class IX Mathematics
Term II
Sample Paper - 4

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. An inconsistent system of two linear equations in two variables will have
(A) one solution
(B) two solutions
(C) no solution
(D) more than two solutions

2. The range of the data set: 70, 65, 75, 71, 36, 55, 61, 62, 41, 40, 39, 35 is
(A) 35
(B) 35
(C) 40
(D) 39

3. The equation of the x-axis is
(A) x+ y = 0
(B) x – y = 0
(C) x = 0
(D) y = 0

4. Two right circular cylinders have equal volumes and heights in the ratio of 1 : 2. Find the ratio of their radii.
(A) 1 : 2
(B) 2 : 1
(C) $\sqrt{2}$: 1
(D) 1 : $\sqrt{2}$

5. The range of the data 14, 27, 29, 61, 45, 15, 9, 18 is
(A) 61
(B) 52
(C) 47
(D) 53

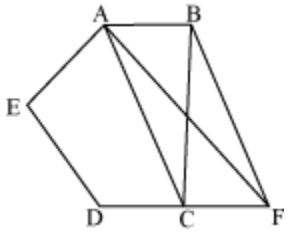
6. AB and CD are two parallel chords of a circle of radius 10 cm and lie on the same side of centre O. If AB = 16 cm and CD = 12 cm. Find the distance between the chords.
(A) 3cm
(B) 4 cm
(C) 2 cm
(D) 5 cm

7. A cylindrical tube 7 m long has an inside diameter of 12 cm and outside diameter of 16 cm. The volume of the metal in the tube is
(A) 61610 cm^3
(B) 61600 cm^3
(C) 61601 cm^3
(D) 61700 cm^3

8. In ΔPQR, PS is the median and A is the midpoint of PS. QA produced meets PR at B. If PR = 9 cm, then PB
(A) 2 cm
(B) 9 cm
(C) 8 cm
(D) 3 cm

(SECTION – B)

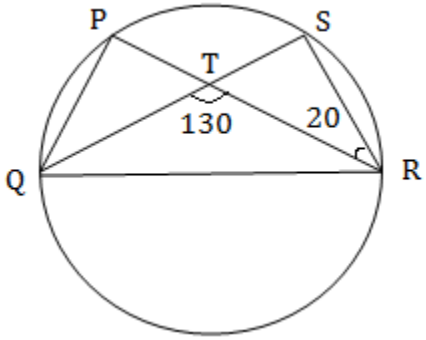
9. In the given figure, ABCDE is a pentagon. A line through B parallel to AC meets DC produced at F. Show that area(ΔACB) = area(ΔACF).



10. A rectangular metallic sheet has dimensions 48 cm x 36 cm. From each corner a square of 8 cm is cut off. An open box is made of the remaining sheet. Find the volume of the box.

11. Find the arithmetic mean of the first 7 natural numbers.

12. In the figure, P, Q, R and S are four points on a circle. PR and QS intersect at a point T such that m∠QTR = 130° and m∠TRS = 20°. Find ∠QPR.



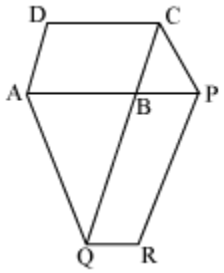
13. Two coins are tossed 1000 times and the outcomes are two heads – 200 times, one tail – 550 times and no tail – 250 times. Then find the probability of getting at most one head.

14. If the mean of 10, 12, 18, 11, p and 19 is 15, find the value of p.

(SECTION – C)

15. Plot the graph of $2x + 3y = 9$.

16. The side AB of a parallelogram ABCD is produced to any point P. A line through A and parallel to CP meets CB produced at Q and then parallelogram PBQR is completed (see the following figure). Show that area(ABCD) = area(PBQR).



17. Suppose you are given a circle, give construction steps to find its centre.

18. The diameter of a roller is 84 cm and its length is 120 cm. It takes 500 complete revolutions to move over once to level a playground. Find the area of the playground in m^2? $\left[\pi = \frac{22}{7}\right]$

OR

The curved surface area of a right circular cylinder of height 14 cm is 88 cm^2. Find the diameter of the base of the cylinder.

19. 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

20. Solve:

$$x - \frac{2}{3}y = \frac{8}{3}, \frac{2x}{5} - y = \frac{7}{5}$$

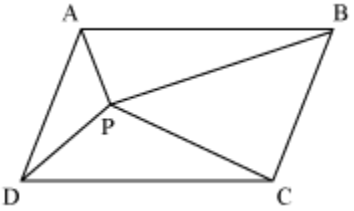
OR

Give the geometric representations of $2x + 9 = 0$ as an equation

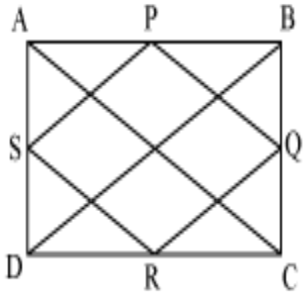
i. in one variable
ii. in two variables

21. A solid cube of side 12 cm is cut into eight cubes of equal volume. What will be the side of the new cube? Also, find the ratio between their surface areas.

22. In the given figure, P is a point in the interior of a parallelogram ABCD. Show that area(ΔAPD) + area(ΔPBC) = area(ΔAPB) + area(ΔPCD)



23. ABCD is a rectangle in which P, Q, R and S are mid-points of the sides AB, BC, CD and DA respectively. Show that the quadrilateral PQRS is a rhombus.



24. Three coins are tossed simultaneously 200 times with different outcomes having the following frequencies:

Outcome	3 heads	2 heads	1 head	No head
Frequency	23	72	77	28

If the three coins are simultaneously tossed again, compute the probability of 2 heads coming up.

(SECTION – D)

25. Show that the line segments joining the mid points of the opposite sides of a quadrilateral bisect each other.

26. Construct a triangle having its perimeter 12.5 cm and the ratio of the angles as 3 : 4 : 5.

OR

Construct ΔABC in which BC = 8 cm, m∠B = 45° and AB – AC = 3.5 cm.

27. Neha and Richa, two students of class IX of a school, together contributed Rs. 100 towards the Prime Minister's Relief Fund, to help earthquake victims. Assume Neha's contribution to be x and that of Richa to be y. Write a linear equation which this data satisfies and draw a graph of the same.

28. If two intersecting chords of a circle make equal angles with the diameter passing through their point of intersection, prove that the chords are equal.

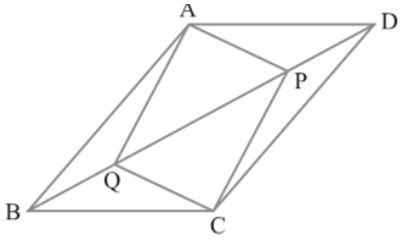
29. A dome of a building is in the form of a hemisphere. From inside, it was white-washed at the cost of Rs. 498.96. If the cost of white-washing is Rs 2.00 per square meter, find the

i. Inner surface area of the dome
ii. Volume of the air inside the dome.

30. The diagonals of parallelogram ABCD intersect at point O. Through O, a line is drawn to intersect AD at P and BC at Q. Show that PQ divides the parallelogram into two parts of equal area.

OR

In parallelogram ABCD, two points P and Q are taken on diagonal BD such that DP = BQ



Show that:

i. Δ APD ≅ Δ CQB
ii. Δ AQB ≅ Δ CPD
iii. APCQ is a parallelogram.

31. Draw the graph of the line x − 2y = 4. From the graph, find the co-ordinates of the point when x = −1.

32. Hamid built a cubical water tank lid for his house, with each outer edge 1.5 m long. He gets the outer surface area of the tank excluding the base covered with square tiles of sides 25 cm. Find how much he would spend for the tiles, if the cost of the tiles is Rs. 360 per dozen.

33. Two chords AB and CD of lengths 5 cm and 11 cm 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.

34. 100 surnames were randomly picked up from a local telephone directory and a frequency distribution of the number of letters in the English alphabet in the surnames was found as follows:

Number of letters	**Number of surnames**
1 – 4	6
4 – 6	30
6 – 8	44
8 – 12	16
12 – 20	4

i. Draw a histogram to depict the given information.
ii. Write the class interval in which the maximum number of surnames lies.