

CBSE Board
Class IX Mathematics
Term II
Sample Paper - 1

Time: 3½ hour

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 range of the data 14, 27, 29, 61, 45, 15, 9, 18 is
A. 61 B. 52 C. 47 D. 53
(Statistics/Measures of Central Tendency/E/1)
2. Two coins are tossed 200 times and the following out comes are recorded

HH	HT/TH	TT
56	110	34

What is the empirical probability of occurrence of at least one Head in the above case

- A. 0.33 B. 0.34 C. 0.66 D. 0.83

(Probability/Probability: Experimental Approach/E/1)

3. The following table shows the weights of students of a class.

Weight	Number of students
35-45	6
45-55	10
55-65	8
65-75	5
75-85	1

The probability that a selected student will weigh more than 55 kg is

(A) $\frac{2}{5}$

(B) $\frac{7}{15}$

(C) $\frac{8}{15}$

(D) $\frac{1}{3}$

(Probability/Probability: Experimental Approach/E/1)

4. If three angles of a quadrilateral are 110° , 82° , 68° , then its fourth angle is

A. 100° B. 110° C. 68° D. 260°

(Quadrilaterals/Types and Angle Sum Property/E/1)

5. The chord, which passes through the centre of the circle, is called a

- A. Radius of the circle.
 B. Diameter of the circle.
 C. Semicircle
 D. None of these

(Circles/Introduction to Circles/E/1)

6. If a right angled triangle is revolved about one of the sides containing the right angle it forms a

- (A) right triangle
 (B) right circular cone
 (C) right circular cylinder
 (D) prism

(Surface Areas and Volumes/Surface Area of a Cone/E/1)

7. In an equation of line $y = 0$, if y co-ordinate is zero, then value of x co-ordinate is:
 (A) 1
 (B) 0
 (C) Infinite
 (D) Finite
 (Linear Equations in Two Variables/ Formation of Linear Equations/E/1)
8. Solutions of the equation $2x + 5y = 0$ is:
 (A) (0,4)
 (B) (0,0)
 (C) (3,0)
 (D) (-3,2)
 (Linear Equations in Two Variables/ Solutions to Linear Equations/E/1)

SECTION - B

9. P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. Show that $\text{area}(\triangle APB) = \text{area}(\triangle BQC)$.
 (Areas of Parallelograms and triangles/ Area of Triangles/M/2)
10. ABCD is a rectangle in which diagonal AC bisects $\angle A$ as well as $\angle C$. Show that ABCD is a square.

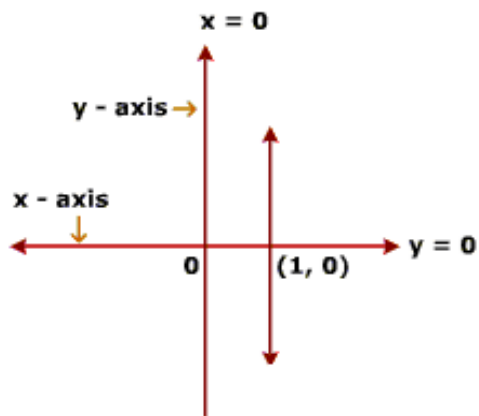
Or

The perimeter of a parallelogram PQRS is 32 cm and $PQ = 10\text{cm}$. Find the measures of other sides.

(Quadrilaterals/ Parallelograms:Basic Properties/M/2)

11. If the point $(-\frac{5}{2}, \sqrt{2})$ lies on the graph of the equation $\frac{2}{5}x - 7 = ay$. Find 'a'.
 (Linear Equations in Two Variables/ Graphical Representations/M/2)

12. Write the equation of the line shown in the figure.



(Linear Equations in Two Variables/ Graphical Representations/M/2)

13. What should be the area of chart paper required to cover a cylindrical box whose radius is 7 cm and height is 15 cm?

(Surface Areas and Volumes/Surface Area of Cylinder/M/2)

14. Find the median of the data
3, 13, 9, 5, 21, 23, 23, 40, 23, 14, 12, 46, 22, 29.
(Statistics/Measures of Central Tendency/E/2)

SECTION - C

15. The following are the weights in kg. of 50 college students. Construct a frequency table, such that the width of each interval is 4 and the upper limit of the last class is 60.

42	42	46	54	41	37	54	44	38	45
47	50	58	49	51	42	46	37	42	39
54	39	51	58	47	51	43	48	49	48
49	41	41	40	58	49	49	59	57	52
56	38	45	52	46	40	51	41	51	41

Or

Two coins are tossed simultaneously 100 times, and following were the findings:

- (i) Two heads : 25 times (ii) One head : 40 times
(iii) No head : 35 times

Find the probability of occurrences of each of these events.

(Probability/Problems on Empirical Probability/M/3)

16. The table below shows students distribution per grade in a school.

Grade	frequency
1	50
2	30
3	40
4	42
5	38
6	50

If a student is selected at random from this school, what is the probability that this student (a) is in grade 3 (b) is not in grade 2, 3, 4 or grade 5?

(Probability/Problems on Empirical Probability/M/3)

17. Find the quadrant in which the lines $x = 3$ and $y = -4$ intersect graphically.

OR

Solve the given equation $mx - 8 = 6 - 7(x + 3)$. Find the value of m for which the equation does not have any solution.

(Linear Equations in Two Variables/Graphical Representations/M/3)

18. Laxmi purchases some bananas and some oranges. Each banana costs Rs.2 while each orange costs Rs.3. If the total amount paid by Laxmi was Rs.30 and the number of oranges purchased by her was 6, then how many bananas did she purchase?

(Linear Equations in Two Variables/Solutions to Linear Equations /M/3)

19. Show that a quadrilateral whose diagonals bisect each other at right angles is a rhombus.

(Quadrilaterals/Parallelograms :Diagonal Properties/M/3)

20. Construct an isosceles triangle whose base = 7.5 cm and the vertical angle is twice each of its base angles.

(Geometric Constructions/construction of Triangles/M/3)

21. In the given figure, P is a point in the interior of a parallelogram ABCD. Show that $\text{ar}(\triangle APB) + \text{ar}(\triangle PCD) = \frac{1}{2} \text{ar}(\text{||}^{\text{gm}} \text{ABCD})$

(Areas of Parallelograms and triangles/Area of Triangles/M/3)

22. Prove that of all parallelograms of given perimeter, a rectangle has the greatest area.

(Areas of Parallelograms and triangles/Concept of Area of Region/M/3)

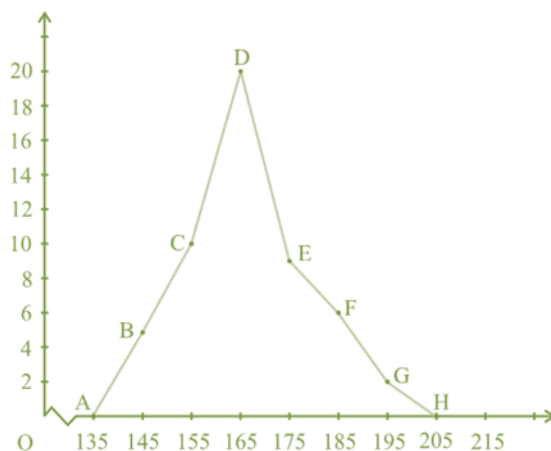
23. Find the total surface area and the height of a cone, if its slant height is 21 m and the diameter of its base is 24 m. (Use $\pi = \frac{22}{7}$)

Or

Find the total surface area and Volume of a cone, if its height is 5 m and the diameter of its base is 24 m. (Use $\pi = \frac{22}{7}$)

(Surface Areas and Volumes/ Volume of a Cone/M/3)

24.



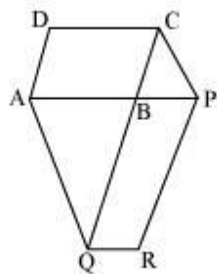
Given above is a frequency polygon drawn for data collected from daily wageworkers in a factory about their daily wages. Make a frequency distribution table for the data the frequency polygon represents.

(Statistics/ Graphical Representation of Data/M/3)

SECTION-D

25. A plastic box 1.5 m long, 1.25 m wide and 65 cm deep, is to be made. It is to be open at the top. Ignoring the thickness of the plastic sheet, determine the cost of sheet for it, if a sheet measuring 1 m^2 costs Rs 20.
(Surface Areas and Volumes/ Surface Area of a Cube & Cuboid /H/4)
26. 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.
(Circles/ Introduction to Circles/H/4)

27. Twenty four people had a blood test and the results are shown below.
 A, B, B, AB, AB, B, O, O, AB, O, B, A
 AB, A, O, O, AB, B, O, A, AB, O, B, A
 (a) Construct a frequency distribution for the data.
 (b) If a person is selected randomly from the group of twenty four people, what is the probability that his/her blood type is not O?
 (c) What value do you draw from this activity?
 (Probability/ Problems on Empirical Probability/M/4)
28. Three years back, a father was 24 years older than his son. At present the father is 5 times as old as the son. How old will the son be three years from now?
 (Linear Equations in Two Variables/ Formation of Linear Equations/M/4)
29. ABCD is a rectangle and 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.
 (Quadrilaterals/ Mid Point Theorem/M/4)
30. 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 (as shown in the following figure). Show that $\text{ar} (\parallel^{\text{gm}} \text{ABCD}) = \text{ar} (\parallel^{\text{gm}} \text{PBQR})$.



(Areas of Parallelograms and triangles/ Area of Triangles/H/4)

31. A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter being 4.4 cm. Find its



- (i) Inner curved surface area,
- (ii) Outer curved surface area,
- (i) Total surface area.

Or

From a right circular cylinder with height 10 cm and radius of base 6 cm, right circular cone of the same height and base is removed. Find the volume of the remaining solid.

(Surface Areas and Volumes/ Volume of a Cylinder/M/4)

32. A solid cylinder has total surface area of 462 square cm. Its curved surface area is one-third of its total surface area. Find the volume of the cylinder. (Take $\pi = \frac{22}{7}$)

(Surface Areas and Volumes/ Volume of a Cylinder/M/4)

33. 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.

OR

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

(Geometric Constructions/construction of Triangles/M/4)

34. Prove that a straight line drawn from the vertex of a triangle to the base is bisected by the straight line which joins the middle points of the other sides of the triangle. (Quadrilaterals /Mid Point Theorem/H/4)