



UNIVERSAL EDUCATION CENTRE

JAYANT SHARMA (94145-37474)

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MATHS 9TH

Time: 3hours

Max. Marks 90

General Instructions

- All questions are compulsory.
- Draw neat labeled diagram wherever necessary to explain your answer.
- Q.No. 1 to 8 are of objective type questions, carrying 1 mark each.
- Q.No.9 to 14 are of short answer type questions, carrying 2 marks each.
- Q. No. 15 to 24 carry 3 marks each. Q. No. 25 to 34 carry 4 marks each.

1. Point $(-10, 0)$ lies

- (A) on the negative direction of the x-axis (B) on the negative direction of the y-axis
(C) in the third quadrant (D) in the fourth quadrant

2. In $\triangle ABC$, $AB = AC$ and $\angle B = 50^\circ$. Then $\angle C$ is equal to

- (A) 40° (B) 50° (C) 80° (D) 130°

3. ABCD is a cyclic quadrilateral such that AB is a diameter of the circle circumscribing it and $\angle ADC = 140^\circ$, then $\angle BAC$ is equal to:

- (A) 80° (B) 50° (C) 40° (D) 30°

4. The linear equation $2x - 5y = 7$ has

- (A) A unique solution (B) Two solutions (C) Infinitely many solutions (D) No solution

5. The class-mark of the class 130-150 is :

- (A) 130 (B) 135 (C) 140 (D) 145

6. The radii of two cylinders are in the ratio of 2:3 and their heights are in the ratio of 5:3. The ratio of their volumes is:

- (A) 10 : 17 (B) 20 : 27 (C) 17 : 27 (D) 20 : 37

7. Two coins are tossed 1000 times and the outcomes are recorded as below :

Number of heads	2	1	0
Frequency	200	550	250

Based on this information, the probability for at most one head is

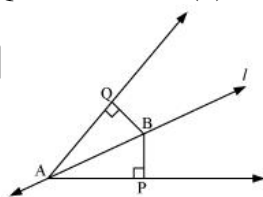
- (A) $1/5$ (B) $1/4$ (C) $4/5$ (D) $3/4$

8. In a cylinder, radius is doubled and height is halved, curved surface area will be

- (A) halved (B) doubled (C) same (D) four times

9. Line l is the bisector of an angle $\angle A$ and B is any point on l . BP and BQ are perpendiculars from B to the arms of $\angle A$ (see the given figure). Show that:

- (i) $\triangle APB \cong \triangle AQB$ (ii) $BP = BQ$ or B is equidistant from the arms of $\angle A$.



10. A patient in a hospital is given soup daily in a cylindrical bowl of diameter 7 cm. If the bowl is filled with soup to a height of 4 cm, how much soup the hospital has to prepare daily to serve 250 patients?

11. The blood groups of 30 students of Class VIII are recoded as follows:

A, B, O, O, AB, O, A, O, B, A, O, B, A, O, O,
 A, AB, O, A, A, O, O, AB, B, A, O, B, A, B, O.

Represent this data in the form of a frequency distribution table. Which is the most common, and which is the rarest, blood group among these students?

12. The above frequency distribution table represents the blood groups of 30 students of a class. Use this table to determine the probability that a student of this class, selected at random, has blood group AB.

Blood group	Number of students
A	9
B	6
AB	3
O	12
Total	30

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

14. A study was conducted to find out the concentration of sulphur dioxide in the air in parts per million (ppm) of a certain city. The data obtained for 30 days is as follows:

0.03 0.08 0.08 0.09 0.04 0.17 0.16 0.05 0.02 0.06 0.18 0.20
 0.11 0.08 0.12 0.13 0.22 0.07 0.08 0.01 0.10 0.06 0.09 0.18
 0.11 0.07 0.05 0.07 0.01 0.04

- (i) Make a grouped frequency distribution table for this data with class intervals as 0.00 - 0.04, 0.04 - 0.08, and so on.

- (ii) For how many days, was the concentration of sulphur dioxide more than 0.11 parts per million?

15. Find the value of k , if $x = 2, y = 1$ is a solution of the equation $2x + 3y = k$.

16. The angles of quadrilateral are in the ratio 3: 5: 9: 13. Find all the angles of the quadrilateral.

17. Construct a triangle ABC in which $BC = 8$ cm, $\angle B = 45^\circ$ and $AB - AC = 3.5$ cm.

18. If the volume of a right circular cone of height 9 cm is 48π cm³, find the diameter of its base.

19. 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.

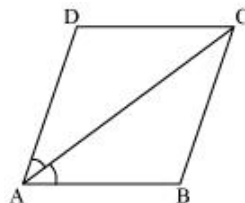
20. If the work done by a body on application of a constant force is directly proportional to the distance travelled by the body, express this in the form of an equation in two variables and draw the graph of the same by taking the constant force as 5 units. Also read from the graph the work done when the distance travelled by the body is (i) 2 units (ii) 0 units

21. If the triangle ABC in the Question 7 above is revolved about the side 5 cm, then find the volume of the solid so obtained. Find also the ratio of the volumes of the two solids obtained in Questions 7 and 8.

22. ABCD is a rhombus. Show that diagonal AC bisects $\angle A$ as well as $\angle C$ and diagonal BD bisects $\angle B$ as well as $\angle D$.

23. Diagonal AC of a parallelogram ABCD bisects $\angle A$ (see the given figure). Show that

- (i) It bisects $\angle C$ also, (ii) ABCD is a rhombus.



24. The length of 40 leaves of a plant are measured correct to one millimetre, and the obtained data is represented in the following table:

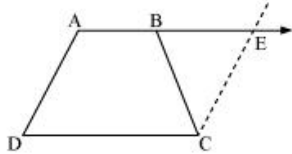
Length (in mm)	Number of leaves
118 – 126	3
127 – 135	5
136 – 144	9
145 – 153	12
154 – 162	5
163 – 171	4
172 – 180	2

(i) Draw a histogram to represent the given data.

(ii) Is there any other suitable graphical representation for the same data?

(iii) Is it correct to conclude that the maximum number of leaves are 153 mm long? Why?

25. ABCD is a trapezium in which $AB \parallel CD$ and $AD = BC$ (see the given figure). Show that



(i) $\angle A = \angle B$ (ii) $\angle C = \angle D$ (iii) $\triangle ABC \cong \triangle BAD$ (iv) diagonal $AC =$ diagonal BD

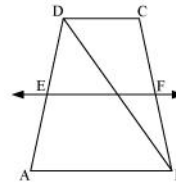
26. Construct a triangle ABC in which $BC = 7$ cm, $\angle B = 75^\circ$ and $AB + AC = 13$ cm.

27. Yamini and Fatima, two students of Class IX of a school, together contributed Rs 100 towards the Prime Minister's Relief Fund to help the earthquake victims. Write a linear equation which satisfies this data. (You may take their contributions as Rs x and Rs y .) Draw the graph of the same.

28. The diameter of a metallic ball is 4.2 cm. What is the mass of the ball, if the density of the metal is 8.9 g per cm^3 ?
(use $\pi = \frac{22}{7}$)

29. The lengths of two parallel chords of a circle are 6 cm and 8 cm. If the smaller chord is at distance 4 cm from the centre, what is the distance of the other chord from the centre?

30. ABCD is a trapezium in which $AB \parallel DC$, BD is a diagonal and E is the mid - point of AD. A line is drawn through E parallel to AB intersecting BC at F (see the given figure). Show that F is the mid-point of BC.



31. A random survey of the number of children of various age groups playing in park was found as follows:

Age (in years)	Number of children
1 – 2	5
2 – 3	3
3 – 5	6
5 – 7	12
7 – 10	9
10 – 15	10
15 – 17	4

Draw a histogram to represent the data above.

32. AC and BD are chords of a circle which bisect each other. Prove that (i) AC and BD are diameters;

(ii) ABCD is a rectangle.

33. Find the volume of a sphere whose surface area is 154 cm^2 .

34. 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

ALL THE BEST