

CLASS IX

SAMPLE PAPER

MATHEMATICS

Time Allowed - 3hours

M.M - 90 marks

► **GENERAL INSTRUCTIONS**

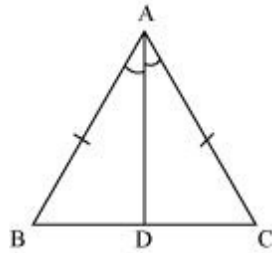
- (i) All questions are compulsory.
- (ii) The question paper consists of **34 questions** divided into four *sections A,B,C and D*.
- (iii) **SECTION A** are multiple choice questions carrying **one mark** each.
- (iv) **SECTION B** are very short answer type questions carrying **two marks** each.
- (v) **SECTION C** are short answer type questions carrying **three marks** each.
- (vi) **SECTION D** are long answer type questions carrying **four marks** each.
- (vii) Use of **calculators** and **cell-phones** are not permitted in the Examination Hall.

SECTION – A

Multiple choice questions Q1 to Q8, each carry 1 mark

► Write the correct answer in each of the following:

1. Which of the following numbers is irrational?
 - A. 0.0173101731...
 - B. 0.0769207692...
 - C. 0.03899721448...
 - D. 0.50349603496...
2. What is the remainder when the polynomial, $x^3 + 7x^2 + 18x + 25$, is divided by another polynomial $(x + 4)$?
 - A. 1
 - B. 2
 - C. 4
 - D. 5
3. In the given figure, $AB = AC$ and $\angle BAD = \angle CAD$. By which congruency rule can $\triangle ADB$ and $\triangle ADC$ be proved congruent?



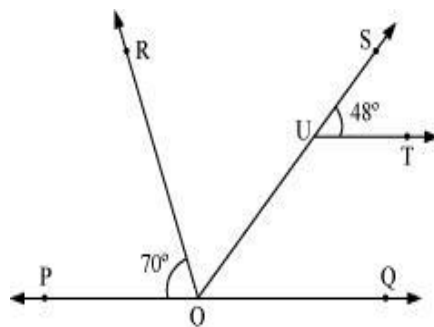
- A. SAS congruency rule
B. SSS congruency rule
C. RHS congruency rule
D. AAS congruency rule
4. The semi-perimeter of an isosceles triangle is 12 cm. The length of its unequal side is 10 cm. What is the length of each equal side of the triangle?
- A. 6 cm
B. 7 cm
C. 8 cm
D. 9 cm
5. Which of the following statements is **not** an equivalent version of Euclid's fifth postulate?
- A. Two distinct intersecting lines cannot be parallel to the same line.
B. For every line l and for every point T not lying on l , there exists a unique line m passing through T and parallel to l .
C. If a straight line crossing two straight lines makes interior angles measuring less than two right angles on the same side, then the two lines, if extended indefinitely, will meet on that side on which the angles measure more than two right angles.
D. If two parallel lines are cut by a transversal, then the alternate interior angles are equal and the corresponding angles are also equal.
6. What is the zero of the polynomial $p(x) = 3x + 1$?
- A. -2
B. $\frac{1}{3}$
C. 0
D. $-\frac{1}{3}$
7. If in ΔPQR , $\angle P = 70^\circ$ and $\angle Q = 75^\circ$, then which of the following relations is correct?
- A. $PQ > QR > PR$

- B. $PQ > PR > QR$
 C. $QR > PR > PQ$
 D. $PR > QR > PQ$
8. If $a + b + c = 0$, then $a^3 + b^3 + c^3$ is equal to:
 A. 0
 B. $(abc)^3$
 C. $3abc$
 D. $3a^3b^3c^3$

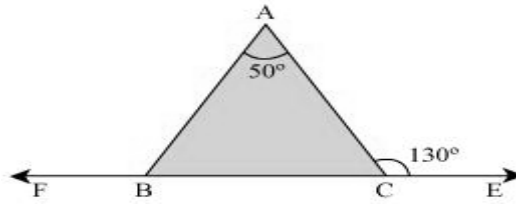
SECTION - B

Very Short Answer type questions Q9 to Q14, each carry 2 Marks

9. Find the value of x: $\left(\frac{3}{4}\right)^3 \left(\frac{4}{3}\right)^{-7} = \left(\frac{3}{4}\right)^{2x}$
10. If $x^2 + kx + 6 = (x+2)(x+3)$ then find the value of 'k'.
11. Using suitable identity, evaluate $(-12)^3 + (7)^3 + (5)^3$
12. In the given figure, $UT \parallel PQ$. What is the measure of $\angle ROS$?



13. The given figure shows $\triangle ABC$ with two exterior angles $\angle ABF$ and $\angle ACE$. It is also given that $\angle BAC = 50^\circ$ and $\angle ACE = 130^\circ$. What is the measure of $\angle ABF$?



14. Find the difference between the ordinates of the points $(-2, 3)$ and $(5, 8)$?

SECTION - C

Short Answer type questions Q15 to Q24, each carry 3 Marks

15. Find a rational number which is equal to the expression, $2.3\bar{6} \div 1.\bar{5}$.

16. If $\frac{\sqrt{2}-1}{\sqrt{2}+1} = a + b\sqrt{2}$, then find value of a and b .

17. Simplify $\frac{7.83 \times 7.83 - 1.17 \times 1.17}{6.66}$

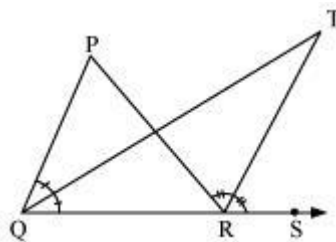
18. (i) State Euclid's first two postulates.

- (ii) In the given figure, points X and Y trisect line segment AB. Use Euclidian Geometry to prove that $XY = \frac{1}{3} AB$.



19. If the bisectors of a pair of alternate interior angles formed by a transversal with two given lines are parallel, then prove that the given lines are parallel.

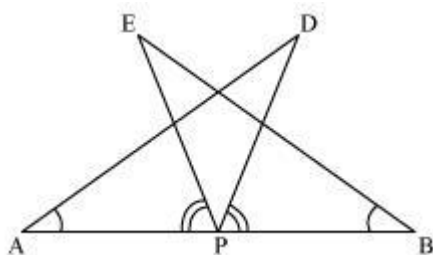
20. In fig, the side QR of ΔPQR is produced to a point S. If the bisectors of $\angle PQR$ and $\angle PRS$ meet at point T, then prove that $\angle QTR = \frac{1}{2} \angle QPR$



21. If two parallel lines are intersected by a transversal, prove that the bisectors of the interior angles on the same side of transversal intersect each other at right angles.

22. Factorize $x^3 - 3x^2 - 9x - 5$

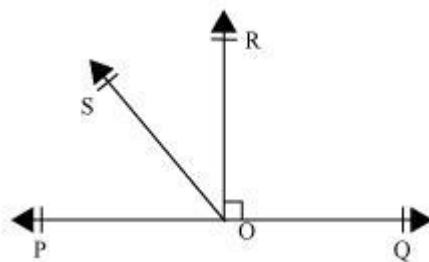
23. Find the area of the trapezium whose parallel sides are of measure 18 cm and 32 cm and the measures of its non-parallel sides are 13 cm and 15 cm
24. AB is a line segment and P is its mid-point. D and E are points on the same side of AB such that $\angle BAD = \angle ABE$ and $\angle EPA = \angle DPB$ (See the given figure). Show that
- (i) $\triangle DAP \cong \triangle EBP$
- (ii) $AD = BE$



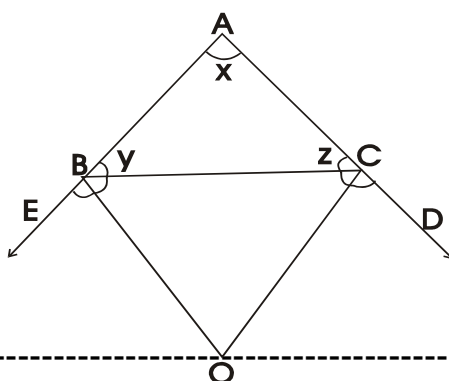
SECTION - D

Long Answer type questions Q25 to Q34, each carry 4 Marks

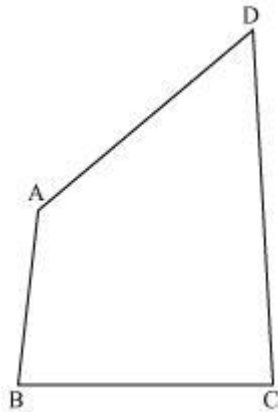
25. If $x = \frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$ and $y = \frac{\sqrt{3} - \sqrt{2}}{\sqrt{3} + \sqrt{2}}$, find $x^2 + y^2$
26. In fig. POQ is a line. Ray OR is perpendicular to line PQ, OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.



27. In fig, the sides AB and AC of $\triangle ABC$ are produced to points E and D respectively. If bisectors BO and CO of $\angle CBE$ and $\angle BCD$ respectively meet at point O, then prove that $\angle BOC = 90^\circ - \frac{1}{2}\angle BAC$.



28. AB and CD are respectively the smallest and longest sides of a quadrilateral ABCD (see the given figure). Show that $\angle A > \angle C$ and $\angle B > \angle D$.



29. Does Euclid's fifth postulate imply the existence of parallel lines? Explain
30. Factorize $(2a - b)^3 + (b - 2c)^3 + 8(c - a)^3$
31. Plotting the points A(3,0), B(3,3), C(0,3) in a Cartesian plane. Join OA, AB, BC and CO. Name the fig. so formed and write one of its property.
32. If $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$ is a polynomial such that when it is divisible by $x - 1$ and $x + 1$, the remainder are respectively 5 and 19. Determine the remainder when $f(x)$ is divided by $(x - 2)$
33. Factorize $9(x - 2y)^2 - 4(x - 2y) - 13$
34. Represent $\sqrt{9.3}$ on the number line.