

MATHEMATICS- 9th

Note: There are THREE sections in this paper i.e. A, B & C. Attempt Section-A and return it to the superintendent within the given time. No marks will be awarded for cutting, erasing and overwriting. Mobile Phones are strictly prohibited in Examination Hall.

Time: 20 minutes

Section A

Marks: 15

1. The determinant of the matrix $\begin{bmatrix} 3 & -6 \\ 2 & -4 \end{bmatrix}$ is equal to
 A) -24 B) 24 C) 12 D) 0 ✓
2. $(-4)^3 = \dots\dots\dots$ A) 12 B) -12 C) -64 ✓ D) 94
3. (i). $(-i) = \dots\dots\dots$ A) 1 ✓ B) -1 C) -i D) i
4. $\ln x - 2 \ln y = \dots\dots\dots$ A) $\ln \frac{x}{y}$ B) $\ln xy^2$ C) $\ln \frac{x^2}{y}$ D) $\ln \frac{x}{y^2}$ ✓
5. $a + b$ is a factor of A) $a^2 - b^2$ ✓ B) $a^2 + b^2$ C) $a^3 - b^3$ D) $(a - b)^2$
6. 0.00729 in scientific notation is equal to.....
 A) 7.29×10^{-4} B) 7.29×10^{-3} ✓ C) 7.29×10^{-2} D) $(x + 2)(x^2 - 2x + 4)$
7. $x^3 + 8 = \dots\dots\dots$
 A) $(x + 2)(x^2 + 2x + 4)$ B) $(x + 2)(x^2 + 2x - 4)$ C) $(x + 2)(x^2 - 2y)$ D) $(x + 2)(x^2 - 2x + 4)$ ✓
8. HCF of $(x+6)^2$ and $x^2 - 36$ is
 A) $x - 6$ B) $(x+6)(x-6)$ C) $x + 6$ ✓ D) $x^2 - 6$
9. The solution set of $\sqrt{x} = -10$ is
 A) $\{ \}$ ✓ B) $\{-10\}$ C) $\{10\}$ D) $\{100\}$
10. The point $(-1, \sqrt{2})$ is located in quadrant
 A) IV B) III C) II ✓ D) I
11. The coordinate of the midpoint of the segment joining the points A(4,6) and B(2,2) are.
 A) (6,8) B) (8,6) C) (4,3) D) (3,4) ✓
12. If opposite angles of a quadrilateral are equal in measure and none of them is a right angle, then the quadrilateral is a
 A) Square B) Parallelogram ✓ C) trapezium D) rectangle
13. In $\triangle ABC$, medians AD, BE and CF intersect at G, if $CF = 24$, what is the length of FG?
 A) 8 ✓ B) 10 C) 12 D) 16
14. In $\triangle ABC$, $m\angle A = 90^\circ$, $m\angle B = 53^\circ$ and $m\angle C = 37^\circ$, What expression correctly relates the length of the sides of this triangle?
 A) $mBC > mAB$ ✓ B) $mAB > mCA$ C) $mBC < mCA$ D) $mAB < mCA$
15. If measure of three angles of a triangle are known, how many triangles can be constructed?
 A) no triangle ✓ B) one triangle C) two triangle D) infinite triangles

Time: 2 Hours 40 Minutes

SECTION-B

Marks: 36

1. Attempt any nine of the following. All carry equal marks.

- i. If $A = \begin{bmatrix} 2 & 5 \\ -3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 1 \\ 2 & 3 \end{bmatrix}$ show that $(AB)^t = B^t A^t$
- ii. Solve the equation $4x + 3y = -2$, $x - 2y = 5$, using Cramer's rule.
- iii. Simplify $\left(\frac{25}{81}\right)^{\frac{2}{3}}$
- iv. Find the value of $a^2 + b^2 + c^2 - ab - bc - ca$ when $a - b = 1$, $b - c = 3$, $c - a = 4$
- v. Solve $\frac{784.6 \times 0.0431}{28.23}$ with the help of logarithm.
- vi. Factorize $2 + 5t - 12t^2$
- vii. If $x = \sqrt{3} - \sqrt{2}$, find the values of $x - \frac{1}{x}$ and $x^2 + \frac{1}{x^2}$
- viii. Factorize $4x^5 - 256x^2$
- ix. Find the square root of $x^4 + x^3 - \frac{31}{4}x^2 - 4x + 16$ by division method.
- x. Find the solution set of $10(x - 4) = 4(2x - 1) + 5$
- xi. Find the LCM of $x^5 - x$, $x^6 - x^2$ and $x^5 - x^3$ by factorization method.
- xii. Find the solution set of $|3x - 5| + 7 = 11$

SECTION-C

Marks: 24

NOTE: Attempt any three of the following questions. All questions carry equal marks.

2. Prove that the points $A(-2,0)$, $B(2,0)$ and $C(0,\sqrt{2})$ are the vertices of an equilateral triangle.
3. If two opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram.
4. If two angles of a triangle are unequal in measure, the side opposite to the greater angle is longer than the side opposite to the smaller angle.
5. Construct ΔPQR , draw their altitude and verify their concurrency. $m\overline{PQ} = 6\text{cm}$, $m\angle P = 70^\circ$ and $m\angle Q = 65^\circ$. Also write down the steps of construction.