MATHEMATICS MOCK TEST

Class: IX | Set: 13

Time: 1 Hour 30 Minutes | Written Marks: 35 | Viva: 5 | Total: 40 Marks

NAME: _____ **ROLL NO:** _____

SECTION A

(1 Mark Each)

1. Find the remainder when the polynomial $p(x) = x^4 - 3x^2 + 2x + 1$ is divided by $(x - 1)$.
2. What is the rationalizing factor of $2 + \sqrt{3}$?
3. Write the coordinates of a point that lies on the x-axis and is at a distance of 3 units from the y-axis (in the negative direction).
4. Express the linear equation $\frac{x}{3} - \frac{y}{4} = 1$ in the standard form $ax + by + c = 0$.
5. Write the degree of the polynomial $f(x) = 3x^4 + 0x^5 + x^2 + 7$.

SECTION B

(2 Marks Each)

6. Rationalize the denominator: $\frac{\sqrt{5}+\sqrt{2}}{\sqrt{5}-\sqrt{2}}$.
7. Check whether $x = -2$ is a zero of the polynomial $p(x) = x^3 + 3x^2 + 3x + 2$.
8. Find the area of the triangle whose vertices are $O(0, 0), A(5, 0)$, and $B(0, 6)$.
9. Expand $(2x - 3y + z)^2$ using a suitable algebraic identity.
10. If $2x + 3y = 12$, find the value of y when $x = 3$.

SECTION C

(3 Marks Each)

11. If $x = \frac{\sqrt{5}+2}{\sqrt{5}-2}$, find the value of $x^2 + \frac{1}{x^2}$.
12. Factorize $x^3 - 3x^2 - x + 3$ completely by grouping.
13. A point $P(4, -2)$ is reflected in the x-axis to get point Q. Point Q is then reflected in the y-axis to get point R. Write the coordinates of Q and R.
14. Solve for x: $2^{x-3} = 1$.

SECTION D

(4 Marks Each)

15. If $x + y = 12$ and $xy = 27$, find the value of $x^3 + y^3$ using algebraic identities.

16. A tank is being filled with water such that the volume V (in liters) after t minutes is given by $V = 10t + 5$. Draw the graph for this equation. From the graph, find the volume of water after 4 minutes.

VIVA VOCE

(5 Marks)

- **Surds:** What is the difference between a pure surd and a mixed surd?
- **Polynomials:** How do you identify if a given expression is a polynomial?
- **Geometry:** What is the name of the vertical line in the Cartesian plane?
- **Equations:** If a line is parallel to the x-axis, what is the value of the coefficient of x in its equation?
- **Identities:** Recite the expansion for $a^3 + b^3 + c^3 - 3abc$.