TUTOR-CREST
MOLDING YOUNG MINDS

Class 9 Mathematics Practice Worksheet: Polynomials

Section A: Objective Type Questions (1 Mark Each)

1. Which of the following is a polynomial?
   a) $\frac{2}{x} + 5$
   b) $x^2 - 4x + 7$
   c) $\sqrt{x} + 3$
   d) $3x^{-2} + 1$
2. What is the degree of the polynomial $4x^5 - 3x^3 + 2x - 6$?
   a) 1
   b) 3
   c) 5
   d) 0
3. The zero of the polynomial $p(x) = 3x - 6$ is:
   a) 1
   b) 2
   c) 3
   d) 4
4. Which of the following expressions is a binomial?
   a) $x^2 + 3x + 4$
   b) $7x - 9$
   c) $5x^3 + 4x^2 + 1$
   d) $2x + 3x^2 - 1$

Section B: Short Answer Questions (2 Marks Each)

5. Write the degree of each of the following polynomials:
   a) $2x^3 + 7x^2 - 5x + 4$
   b) $4y^2 - 3y + 1$
6. Find the zero of the polynomial $p(x) = x + 7$.
7. Factorize the following using suitable identities:
   a) $(x + 3)^2 - 25$
   b) $4x^2 - 9$
8. Give one example each of:
   a) A monomial of degree 6.
   b) A trinomial of degree 2.

Section C: Short Answer Questions (3 Marks Each)

9. Use the Remainder Theorem to find the remainder when $p(x) = x^3 - 3x + 2$ is divided by $x - 1$.
10. If $(x + 2)$ is a factor of $p(x) = x^3 + 3x^2 + kx + 6$, find the value of k.
11. Factorize the polynomial:
    a) $x^2 + 7x + 10$
12. Verify whether $x = -1$ and $x = 2$ are the zeroes of the polynomial $p(x) = x^2 - x - 2$.

Section D: Long Answer Questions (4 Marks Each)

13. Factorize the following polynomials:
    a) $x^3 - 6x^2 + 11x - 6$
    b) $3x^2 - 5x + 2$
14. Find all the zeroes of the polynomial $p(x) = x^2 - 4x + 4$, and verify the relationship between the zeroes and the coefficients.
15. Use the Factor Theorem to determine whether $x - 3$ is a factor of $p(x) = 2x^3 - 9x^2 + 12x - 4$.

Section E: Higher Order Thinking Skills (HOTS)

16. Prove that $(x - y)^3 = x^3 - y^3 - 3xy(x - y)$ using algebraic identities.
17. If the perimeter of a square is represented by the polynomial $4x + 8$ and its area is given by $x^2 + 4x + 4$, find the side of the square.
18. Expand the expression $(2x + 3y + 4)^2$ using suitable algebraic identities.
