Worksheet 3: Chapter 2 – Polynomials

Class 10 – Mathematics (CBSE)

Chapter Name: Polynomials

Max Marks: 30

Time: 1 Hour

Section A: Multiple Choice Questions (MCQs)

(Each question carries 1 mark)

1. The zeros of the quadratic polynomial $p(x) = x^2 + x - 6$ are:
   a) 2, -3
   b) -2, 3
   c) 1, -6
   d) -1, 6

2. If the sum of the zeros of the polynomial $p(x) = ax^2 + bx + c$ is -4 and the product is 5, then the quadratic polynomial is:
   a) $x^2 + 4x + 5$
   b) $x^2 - 4x + 5$
   c) $x^2 + 4x - 5$
   d) $x^2 - 4x - 5$

3. The degree of a non-zero constant polynomial is:
   a) 0
   b) 1
   c) 2
   d) Undefined

4. The graph of the polynomial $p(x) = x^2 - 4x + 4$ intersects the x-axis at:
   a) One point
   b) Two points
   c) Three points
   d) No point
5. The sum of the zeros of the quadratic polynomial $p(x) = 4x^2 - 7x + 3$ is:
   a) 4
   b) $-\frac{7}{4}$
   c) $\frac{7}{4}$
   d) 7

Section B: Short Answer Type Questions (2 Marks Each)

6. If the zeros of the polynomial $p(x) = 3x^2 + 5x + k$ are -1 and 2, find the value of k.
7. Find the zeros of the quadratic polynomial $p(x) = x^2 - 10x + 21$.
8. Write the quadratic polynomial whose zeros are $\alpha = 2$ and $\beta = -7$.
9. Verify whether $x = 1$ and $x = 3$ are the zeros of the polynomial $p(x) = x^2 - 4x + 3$.

Section C: Long Answer Type Questions (3 Marks Each)

10. The zeros of a polynomial are -3 and 5. Find the quadratic polynomial.
11. Find the zeros of the quadratic polynomial $p(x) = 4x^2 - 12x + 9$ and verify the relationship between the zeros and coefficients.
12. If α and β are the zeros of the polynomial $p(x) = x^2 - 6x + 8$, find a quadratic polynomial whose zeros are $\alpha + 2$ and $\beta + 2$.
13. Solve $p(x) = x^2 - 5x + 6$ for its zeros and verify the sum and product of the zeros.

Section D: Long Answer Type Questions (4 Marks Each)

14. The sum and product of the zeros of a quadratic polynomial are 6 and 9, respectively. Find the quadratic polynomial and verify its zeros.
15. For the polynomial $p(x) = 2x^2 - 8x + 6$, find its zeros and verify the relationship between the zeros and coefficients. Draw the graph of this polynomial.

Section E: Case Study (5 Marks)

Case Study: Analyzing the Zeros of a Polynomial

Problem:
A student plotted the graph of the quadratic polynomial $p(x) = x^2 - 8x + 12$ and found that it intersects the x-axis at two points.

- The zeros of the polynomial are distinct.
- The student wants to check the relationship between the zeros and the coefficients.

16. Find the zeros of the polynomial.
17. What is the sum of the zeros?
18. What is the product of the zeros?
19. How many times does the graph intersect the x-axis?
20. Draw the graph of $p(x)$.

Answer Key:

Section A (MCQs):

1. a) 2, -3
2. b) $x^2 - 4x + 5$
3. a) 0
4. a) One point
5. c) $\frac{7}{4}$