Worksheet 4: 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. If one zero of the quadratic polynomial $p(x) = x^2 + 7x + 10$ is -5, the other zero is:
   a) -2
   b) 2
   c) -3
   d) 3
2. The graph of the quadratic polynomial $p(x) = x^2 - 16$ intersects the x-axis at:
   a) Two points
   b) One point
   c) No point
   d) Three points
3. If the product of the zeros of the polynomial $p(x) = 3x^2 + 4x - 1$ is 4, then the value of c/a is:
   a) 4
   b) $\frac{-4}{3}$
   c) $\frac{1}{3}$
   d) -4

4. The sum of the zeros of the polynomial $p(x) = x^2 - 11x + 30$ is:
   a) 11
   b) -11
   c) 30
   d) -30
5. If the sum and product of the zeros of a quadratic polynomial are 8 and 15, respectively, the polynomial is:
   a) $x^2 + 8x + 15$
   b) $x^2 - 8x + 15$
   c) $x^2 - 8x - 15$
   d) $x^2 + 8x - 15$

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

6. Find the zeros of the quadratic polynomial $p(x) = x^2 - 5x + 6$.
7. Write the quadratic polynomial whose zeros are 3 and 7.
8. If one zero of the polynomial $p(x) = 4x^2 + 8x + k$ is 2, find the value of k.
9. Verify whether $x = 2$ and $x = 4$ are zeros of the polynomial $p(x) = x^2 - 6x + 8$.

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

10. The sum and product of the zeros of a quadratic polynomial are 9 and 20, respectively. Find the quadratic polynomial.
11. Find the zeros of the quadratic polynomial $p(x) = x^2 + 6x + 9$, and verify the relationship between the zeros and coefficients.
12. If α and β are the zeros of the polynomial $p(x) = x^2 - 10x + 24$, find a quadratic polynomial whose zeros are $\alpha + 3$ and $\beta + 3$.
13. Solve $p(x) = x^2 - 3x - 10$ for its zeros and verify the sum and product of the zeros.

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

14. If the sum and product of the zeros of a quadratic polynomial are 7 and 12, respectively, find the quadratic polynomial and verify its zeros.
15. For the polynomial $p(x) = 3x^2 - 15x + 18$, 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 a Quadratic Polynomial

Problem:
A student is studying the quadratic polynomial $p(x) = x^2 - 9x + 20$ and is asked to find its zeros and sketch its graph.

- The polynomial has two distinct real zeros.
- The graph of the polynomial intersects the x-axis.

16. What are 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. Sketch the graph of $p(x) = x^2 - 9x + 20$.

Answer Key:

Section A (MCQs):

1. a) -2
2. a) Two points
3. b) $\frac{-4}{3}$
4. a) 11
5. b) $x^2 - 8x + 15$