TUTOR-CREST
MOLDING YOUNG MINDS

Class 10 Maths Worksheet

Chapter 4: Quadratic Equations

Section A: Multiple Choice Questions (MCQs)

1. The roots of the quadratic equation $x^2 - 5x + 6 = 0$ are:
   (A) 2, 3
   (B) -2, -3
   (C) 5, 6
   (D) -5, 6
2. If one root of the quadratic equation $x^2 + 4x + k = 0$ is 2, then the value of k is:
   (A) 4
   (B) 6
   (C) -8
   (D) -4
3. The discriminant D of the quadratic equation $3x^2 + 2x + 1 = 0$ is:
   (A) -8
   (B) 8
   (C) 4
   (D) 0
4. For what value of k does the equation $2x^2 + kx + 8 = 0$ have equal roots?
   (A) 8
   (B) -8
   (C) 4
   (D) -4

Section B: Short Answer Type Questions (2 Marks)

1. Solve the quadratic equation $x^2 - 7x + 12 = 0$ by factorization.
2. Find the value of k for which the quadratic equation $2x^2 + kx + 3 = 0$ has real and equal roots.
3. Determine the nature of roots for the quadratic equation $x^2 - 4x + 5 = 0$.

Section C: Long Answer Type Questions (3 Marks)

1. Using the quadratic formula, solve $3x^2 - 2x - 1 = 0$.
2. The product of two consecutive positive integers is 182. Form the quadratic equation and find the integers.
3. A train travels a distance of 48 km at a uniform speed. If the speed had been 8 km/h more, it would have taken 1 hour less for the same journey. Find the original speed of the train.

Section D: Case-Based Questions (4 Marks)

Read the following passage and answer the questions:

Ravi is standing on a hill and throws a ball upward. The height h of the ball (in meters) at any time t (in seconds) is given by the quadratic equation $h = -5t^2 + 20t + 15$.

1. After how many seconds will the ball reach its maximum height?
2. What is the maximum height reached by the ball?
3. After how many seconds will the ball hit the ground?

Section E: Assertion-Reasoning Questions (1 Mark Each)

Directions: In the following questions, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option:

- (A) Both A and R are true, and R is the correct explanation of A.
- (B) Both A and R are true, but R is not the correct explanation of A.
- (C) A is true, but R is false.
- (D) A is false, but R is true.

1. **Assertion (A):** The quadratic equation $2x^2 + 3x - 2 = 0$ has two distinct real roots.
   Reason (R): The discriminant of a quadratic equation is given by $D = b^2 - 4ac$.
2. **Assertion (A):** The quadratic equation $x^2 + 4x + 4 = 0$ has two equal real roots.
   Reason (R): The discriminant D of the equation is zero.

Answer Key

MCQs:

1. (A)
2. (C)
3. (A)
4. (C)
