

Class 10 Maths Worksheet

Chapter 4: Quadratic Equations

Section A: Multiple Choice Questions (MCQs)

1. The value of the discriminant for the quadratic equation $2x^2 - 3x + 5 = 0$ is:
(A) 1
(B) -31
(C) 31
(D) -1
 2. For which value of p , the quadratic equation $x^2 - 2px + 1 = 0$ will have equal roots?
(A) 1
(B) 2
(C) -1
(D) -2
 3. The sum and product of the roots of the equation $x^2 - 7x + 12 = 0$ are:
(A) 7 and 12
(B) -7 and 12
(C) 7 and -12
(D) 7 and -12
 4. Which of the following quadratic equations has no real roots?
(A) $2x^2 - 4x + 3 = 0$
(B) $x^2 - 5x + 6 = 0$
(C) $3x^2 + 6x + 1 = 0$
(D) $x^2 - 3x + 2 = 0$
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Section B: Short Answer Type Questions (2 Marks)

1. Solve $5x^2 - 6x = 2$ by the method of completing the square.
 2. Find the roots of the equation $x^2 + 7x + 10 = 0$ using factorization.
 3. For what value of k , the quadratic equation $3x^2 + kx + 9 = 0$ has equal roots?
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Section C: Long Answer Type Questions (3 Marks)

1. Find the roots of the quadratic equation $2x^2 - 5x + 3 = 0$ by using the quadratic formula.
 2. A rectangular garden has an area of 180 square meters. The length of the garden is 3 meters more than twice its width. Find the dimensions of the garden.
 3. The speed of a boat in still water is 8 km/h. It goes 15 km upstream and returns to the starting point in 4 hours. Find the speed of the stream.
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Section D: Case-Based Questions (4 Marks)

Read the following situation and answer the questions:

A bridge is being constructed over a river, and its height is modeled by the equation $h = -3t^2 + 24t + 5$, where h is the height of the arch (in meters) and t is the time in seconds after construction starts.

1. How long will it take for the height of the arch to reach its maximum?
 2. What will be the maximum height?
 3. After how many seconds will the arch return to a height of 5 meters?
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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 $x^2 + 6x + 9 = 0$ has two equal real roots.
Reason (R): The discriminant D of a quadratic equation is zero when roots are equal.
 2. Assertion (A): The quadratic equation $4x^2 - 3x + 2 = 0$ has real roots.
Reason (R): The discriminant $D = b^2 - 4ac$ is positive for this equation.
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Answer Key

MCQs:

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