

Mathematics

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(Chapter – 4) (Quadratic Equations) (Practice Test 4)

(Class X)

Time: 2 Hours

M. M: 50

General Instructions:

1. This question paper contains four sections: A, B, C and D. Each part is compulsory.
2. Section A has 10 MCQ of one mark each.
3. Section B has 5 questions of two marks each.
4. Section C has 6 questions of three marks each. attempt any 5 out of 6.
5. Section D has 5 questions of five marks each, attempt any 3 out of 5.
6. There is no negative marking.

[Section – A]

1. The roots of the quadratic equation $x + \frac{1}{x} = 3$, $x \neq 0$ are
(A) $3 + \sqrt{5}, 3 - \sqrt{5}$ (B) $2 + \sqrt{5}, 2 - \sqrt{5}$ (C) $\frac{3 + \sqrt{5}}{2}, \frac{3 - \sqrt{5}}{2}$ (D) $\frac{3 + \sqrt{3}}{2}, \frac{3 - \sqrt{3}}{2}$
2. The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ is
(A) 3 (B) 6 (C) -3 (D) 2
3. If the roots of $ax^2 + bx + c = 0$ are in the ratio $m : n$, then
(A) $mna^2 = (m + n)c^2$ (B) $mnb^2 = (m + n)ac$
(C) $mn b^2 = (m + n)^2 ac$ (D) $mnb^2 = (m - n)^2 ac$
4. If one root of the equation $x^2 + px + 12 = 0$ is 4, while the equation $x^2 + px + q = 0$ has equal roots, the value of q is
(A) $\frac{49}{4}$ (B) $\frac{4}{49}$ (C) 4 (D) 49
5. a and p are the roots of $4x^2 + 3x + 7 = 0$, then the value of $\frac{1}{a} + \frac{1}{p}$ is
(A) $-\frac{3}{4}$ (B) $-\frac{3}{7}$ (C) $\frac{3}{7}$ (D) $\frac{7}{4}$
6. If a, p are the roots of the equation $(x - a)(x - b) + c = 0$, then the roots of the equation $(x - a)(x - p) = c$ are
(A) a, b (B) a, c (C) b, c (D) none of these
7. Mohan and Sohan solve an equation. In solving Mohan commits a mistake in constant term and finds the roots 8 and 2. Sohan commits a mistake in the coefficient of x . The correct roots are
(A) 9, 1 (B) -9, 1 (C) 9, -1 (D) -9, -1
8. If a and p are the roots of the equation $2x^2 - 3x - 6 = 0$. The equation whose roots are $\frac{1}{a}$ and $\frac{1}{p}$ is
(A) $6x^2 - 3x + 2 = 0$ (B) $6x^2 + 3x - 2 = 0$ (C) $6x^2 - 3x - 2 = 0$ (D) $x^2 + 3x - 2 = 0$
9. If the roots of $px^2 + qx + 2 = 0$ are reciprocal of each other, the
(A) $P = 0$ (B) $p = -2$ (C) $p = \pm 2$ (D) $p = 2$
10. If one root of the quadratic equation $2x^2 + kx - 6 = 0$ is 2, the value of k is
(A) 1 (B) -1 (C) 2 (D) -2

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[Section - B]

11. Solve $12abx^2 - 9a^2x + 8b^2x - 6ab = 0$.
12. Find the value of k for which the quadratic equation $kx^2 + 2x + 1 = 0$ has real and distinct root.
13. Determine the nature of the roots of the quadratic equation $9a^2b^2x^2 - 24abcdx + 16c^2d^2 = 0$
14. Find the discriminant of the equation $(x - 1)(2x - 1) = 0$
15. Find the value of k so that $(x - 1)$ is a factor of $k^2x^2 - 2kx - 3$.

[Section - C]

16. The sum of two numbers is 16. The sum of their reciprocals is $\frac{1}{\beta}$. Find the numbers.
17. Solve for x : $\sqrt{217 - x} = x - 7$
18. Find the value of p for which the roots of the equation $px(x - 2) + 6 = 0$, are equal.
19. Solve the quadratic equation $2x^2 + ax - a^2 = 0$ for x .
20. If $x = \frac{2}{3}$ and $x = -3$ are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b .
21. Find the value of p , for which one root of the quadratic equation $px^2 - 14x + 8 = 0$ is 6 times the other.

[Section - D]

22. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k .
23. Solve for x : $\sqrt{6x + 7} - (2x - 7) = 0$
24. For what values of k , the roots of the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ are equal?
25. For what value of k , are the roots of the quadratic equation: $(k - 12)x^2 + 2(k - 12)x + 2 = 0$ equal?
26. If the roots of the quadratic equation $(a - b)x^2 + (b - c)x + (c - a) = 0$ are equal, prove that $2a = b + c$.



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Answers

Section - A

1. $\frac{3+\sqrt{5}}{2}, \frac{3-\sqrt{5}}{2}$
2. -3
3. $mnb^2 = (m+n)^2 ac$
4. $\frac{49}{4}$
5. $-\frac{3}{7}$
6. a, b
7. 9, 1
8. $6x^2 + 3x - 2 = 0$
9. $p = 2$
10. -1

Section - B

11. $x = \frac{3a}{4b}$ or $x = -\frac{2b}{3a}$
12. $k < 1$
13. 0
14. 1
15. $k = 3$ or $k = -1$

Section - C

16. $x = 12$ or $x = 4$
17. $x = 21$ or $x = -8$
18. $p = 6$
19. $x = -a, x = \frac{a}{2}$
20. $a = 3, b = -6$
21. $p = 3$

Section - D

22. $\frac{7}{4}$
23. $x = 7$ is the only solution.
24. $k = 5, -3$
25. $k = 14$
26. Here ' a ' = $a - b$, ' b ' = $b - c$, ' c ' = $c - a$
D = 0 Roots are equal
 $2a = b + c$

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