Saitechinfo NEET JEE Academy

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QUADRATIC EQUATIONS

Class 11 - Mathematics

Time Allowed: 1 hour and 29 minutes **Maximum Marks: 45**

1. The roots of the quadratic equation are said to be imaginary if the discriminant is: **[1]**

   a) < 0 b) ≥ 0

   c) > 0 d) ≤ 0

2. The roots of the quadratic equation $x^2 + 5 = 0$ are: **[1]**

   a) 5 ,- 5 b) $i\sqrt{5}, -i\sqrt{5}$

   c) $\sqrt{5}, -\sqrt{5}$ d) $i\sqrt{5}, i\sqrt{5}$

3. If $x^2 + px + q = 0$ and $x^2 + qx + p = 0$ have exactly 1 common root, then what is the value of (p + q)? **[1]**

   a) 0 b) -2

   c) -1 d) 1

4. The roots of the quadratic equation are said to be real if the discriminant is: **[1]**

   a) < 0 b) > 0

   c) ≤ 0 d) ≥ 0

5. If p and q are the roots of the equation $x^2 + px + q = 0$ then, what are the values of p and q? **[1]**

   a) p = -2, q = 1 b) p = 1, q = -2

   c) p = -2, q = 0 d) p = 0, q = 1

6. If α and β are the roots of $2x^2 + 5x - 4 = 0$, then find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha}$. **[2]**

7. Sum of the areas of two squares is 468 m^2. If the difference of their perimeters is 24 m, find the quadratic equation. **[2]**

8. Solve the equation $\sqrt{3}x^2 - \sqrt{2}x + 3\sqrt{3} = 0$. **[2]**

9. Given that α and β are the roots of the quadratic equation $px^2 + qx + 1 = 0$, find the value of $\alpha^3\beta^2 + \alpha^2\beta^3$. **[2]**

10. Let p, q be the roots of $3x^2 + 6x + 2 = 0$. Form an equation whose roots are $\frac{-p^2}{q}, \frac{-q^2}{p}$. **[2]**

11. If the roots of $ax^2 + x + b = 0$ are real and distinct, show that the roots of the equation $\frac{x^2+1}{x} = 4\sqrt{ab}$ are imaginary. **[6]**

12. The roots of the equation $px^2 - 2(p + 2)x + 3p = 0$ differ by 2. Find p and also the roots. **[6]**

13. If α and β are the roots of equation $2x^2 - x - 3 = 0$, then find a equation having roots $(2\alpha + 3)$ and $(2\beta + 3)$. **[6]**

14. If a, b are roots of the equation $x^2 + px + 1 = 0$, and c, d are roots of $x^2 + qx + 1 = 0$, then prove that $(a - c)(b - c) + (a - d)(b - d) = q^2 - pq$. **[6]**

15. If α, β be the roots of $x^2 + lx + m = 0$, then form an equation whose roots are: $(\alpha + \beta)^2$ and $(\alpha - \beta)^2$ **[6]**

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