JEE	Class – 11th	Topic – Roots of a Quadratic Equation

1. If the roots of $x^2 + px + q = 0$ are both real and equal, then:

   (A) $p^2 = 4q$

   (B) $p^2 > 4q$

   (C) $p^2 < 4q$

   (D) $p^2 = -4q$

2. The sum and product of the roots of $2x^2 - 5x + 3 = 0$ are:

   (A) $\frac{5}{2}, \frac{3}{2}$

   (B) $\frac{5}{2}, 3$

   (C) $5, \frac{3}{2}$

   (D) $5, 3$

3. If α and β are roots of $x^2 - 6x - 2 = 0$, then the value of $\alpha^2 + \beta^2$ is:

   (A) 36

   (B) 40

   (C) 38

   (D) 20

4. The quadratic equation whose roots are 3 and 4 is:

   (A) $x^2 - 7x + 12 = 0$

   (B) $x^2 + 7x - 12 = 0$

   (C) $x^2 - x + 12 = 0$

   (D) $x^2 + 7x + 12 = 0$

5. If one root of $x^2 + px + q = 0$ is twice the other, then:

   (A) $p^2 = 8q$

   (B) $p^2 = 4q$

   (C) $p^2 = 2q$

   (D) $p^2 = 16q$

6. If $2 + i\sqrt{3}$ is a root of $x^2 + px + q = 0$, then (p, q) is:

   (A) $(-4, 7)$

   (B) $(4, -7)$

   (C) $(-7, 4)$

   (D) $(4, 7)$

7. The condition for the roots of $ax^2 + bx + c = 0$ to be real and distinct is:

   (A) $b^2 - 4ac > 0$

   (B) $b^2 - 4ac = 0$

   (C) $b^2 - 4ac < 0$

   (D) $b^2 + 4ac > 0$

8. If the product of the roots of $mx^2 - 2x + (2m - 1) = 0$ is 3, then m is:

   (A) -1

   (B) 1

   (C) 2

   (D) 3

9. If both roots of $x^2 - 2ax + a^2 - 1 = 0$ lie between $(-2, 2)$, then the possible integer value(s) of a is/are:

   (A) $-1, 0$

   (B) $0, 1$

   (C) $1, 2$

   (D) $2, 3$

10. The roots of $x^2 + 2x + 2 = 0$ are:

    (A) Real and equal

    (B) Real and distinct

    (C) Complex conjugates

    (D) Both zero

11. If the roots of $x^2 + bx + c = 0$ are reciprocal, then:

    (A) $c = 1$
    (B) $b = 1$
    (C) $b = 0$
    (D) $c = -1$

12. If the sum of the roots of $x^2 + 5x + 6 = 0$ is S and the product is P, then (S, P) is:

    (A) $(-5, 6)$
    (B) $(5, 6)$
    (C) $(-5, -6)$
    (D) $(5, -6)$

13. The equation whose roots are squares of the roots of $x^2 + px + q = 0$ is:

    (A) $y^2 + 2py + (p^2 - 2q) = 0$
    (B) $y^2 - 2py + (p^2 - 2q) = 0$
    (C) $y^2 - 2py + (p^2 + 2q) = 0$
    (D) $y^2 + 2py + (p^2 + 2q) = 0$

14. If the roots of $x^2 + bx + c = 0$ are equal, then the value of $b^2 - 4c$ is:

    (A) 0
    (B) 1
    (C) 4
    (D) -4

15. If the roots of $x^2 + x + 1 = 0$ are α and β, then the value of $\alpha^3 + \beta^3$ is:

    (A) 1
    (B) 0
    (C) -1
    (D) 2