

JEE	Class - 11 th	Topic - Roots of a Quadratic Equation
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- If α and β are the roots of the equation $x^2 + x + 1 = 0$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is:

(a) 1 (b) 0
(c) -1 (d) 2
- Let α and β be the roots of $x^2 - 6x - 2 = 0$, with $\alpha > \beta$. If $a_n = \alpha^n - \beta^n$ for $n \geq 1$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is:

(a) 1 (b) 2
(c) 3 (d) 4
- If both the roots of the quadratic equation $x^2 - mx + 4 = 0$ are real and distinct and they lie in the interval $(1, 3)$, then m lies in the interval:

(a) (4,5) (b) (3,4)
(c) (5,6) (d) (-5, -4)
- The number of all possible positive integral values of k for which the roots of the quadratic equation $6x^2 - 11x + k = 0$ are rational numbers is:

(a) 2 (b) 5
(c) 3 (d) 4
- If one real root of the quadratic equation $81x^2 + kx + 256 = 0$ is the cube of the other root, then a value of k is:

(a) -81 (b) 100
(c) -300 (d) 144

6. If α and β are the roots of $x^2 + px - 444p = 0$ where p is a prime number and the roots are integral, then the value(s) of p is/are:
- (a) 2 (b) 3
(c) 2,3,37 (d) 37
7. Let α and β be the roots of $x^2 + 2x + 2 = 0$, then $\alpha^{15} + \beta^{15}$ is equal to:
- (a) 512 (b) -512
(c) -256 (d) 256
8. If the roots of the quadratic equation $x^2 + x\sin\theta - 2\sin\theta = 0$, $\theta \neq 0, 2\pi$, are α and β , then $\alpha^{12} + \beta^{12}$ is equal to:
- (a) $2\sin 8\theta$ (b) $2\sin 4\theta$
(c) $2\sin 6\theta$ (d) $2\sin 2\theta$
9. If $2 + i\sqrt{3}$ is a root of the equation $x^2 + px + q = 0$, where p and q are real, then (p, q) equals:
- (a) $(-4, 7)$ (b) $(4, -7)$
(c) $(-7, 4)$ (d) $(4, 7)$
10. If the quadratic equations $x^2 + ax + b = 0$ and $x^2 + bx + a = 0$, with $a \neq b$, have a common root, then the value of $a + b$ is:
- (a) 1 (b) -1
(c) 2 (d) 0
11. The number of integral values of m for which the quadratic expression $(1 + 2m)x^2 - 2(1 + 3m)x + 4(1 + m)$ is always positive for all real x is:
- (a) 8 (b) 7
(c) 6 (d) 3

12. If α and β are the roots of the equation $px^2 + qx + r = 0$, $p \neq 0$, and p, q, r are in A.P. and $\frac{1}{\alpha} + \frac{1}{\beta} = 4$, then the value of $|\alpha - \beta|$ is:
- (a) $\frac{34}{9}$ (b) $\frac{2\sqrt{13}}{9}$
(c) $\frac{61}{9}$ (d) $\frac{2\sqrt{17}}{9}$
13. If the product of the roots of the equation $x^2 - 3kx + 2e^{2\log k} - 1 = 0$ is 7, then the roots are real for k equal to:
- (a) 1 (b) 2
(c) 3 (d) 7
14. If both the roots of the quadratic equation $x^2 + (3 - \lambda)x + 2 = \lambda$ have the least sum of squares, then the value of λ is:
- (a) 2 (b) 4
(c) $\frac{1\pi}{8}$ (d) 1
15. If the roots of the quadratic equation $x^2 + px + q = 0$ are $\tan 30^\circ$ and $\tan 15^\circ$, then the value of $2 + q - p$ is:
- (a) 2 (b) 3
(c) 0 (d) 1