

3. Quadratic Equation and Inequalities (Inequalities)

ai24btech11020 - Rishika Kotha

24. The equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ has: [2012]
 (a) infinite number of real roots
 (b) no real roots
 (c) exactly one real root
 (d) exactly four roots
25. The real number k for which the equation, $2x^3 + 3x + 4 = 0$ has two distinct real roots in $[0, 1]$ [JEE M 2013]
 (a) lies between 1 and 2
 (b) lies between 2 and 3
 (c) lies between -1 and 0
 (d) does not exist.
26. The number of values of k , for which the system of equations: [JEE M 2013]
 $(k+1)x + 8y = 4k$
 $kx + (k+3)y = 3k - 1$
 has no solution, is
 (a) infinite (b) 1
 (c) 2 (d) 3
27. If the equations $x^2 + 2x + 3 = 0$ and $ax^2 + bx + c = 0$, $a, b, c \in \mathbb{R}$, have a common root, then $a:b:c$ is [JEE M 2013]
 (a) 1:2:3 (b) 3:2:1
 (c) 1:3:2 (d) 3:1:2
28. If $a \in \mathbb{R}$ and the equation $-3(x - [x])^2 + 2(x - [x]) + a^2 = 0$ (where $[x]$ denotes the greatest integer $\leq x$) has no integral solution, then all possible values of a lie in the interval: [JEE M 2014]
 (a) $(-2, -1)$ (b) $(-\infty, 2) \cup (2, \infty)$
 (c) $(-1, 0) \cup (0, 1)$ (d) $(1, 2)$
29. Let α and β be the roots of equation $px^2 + qx + r = 0$, $p \neq 0$. If p, q, r are in A.P. and $\frac{1}{\alpha} + \frac{1}{\beta} = 4$, then the value of $|\alpha - \beta|$ is: [6pt] [JEE M 2014]
 (a) $\frac{\sqrt{34}}{9}$ (b) $\frac{2\sqrt{13}}{9}$
 (c) $\frac{\sqrt{61}}{9}$ (d) $\frac{2\sqrt{17}}{9}$
30. Let α and β be the roots of the equation $x^2 - 6x - 2 = 0$. If $a_n = \alpha^n - \beta^n$, for $n \geq 1$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is equal to: [JEE M 2015]
 (a) 3 (b) -3
 (c) 6 (d) -6
31. The sum of all real values of x satisfying the equation $(x^2 - 5x + 5)^{x^2 + 4x + 60} = 1$ is: [JEE M 2016]
 (a) 6 (b) 5
 (c) 3 (d) -4
32. If $\alpha, \beta \in \mathbb{C}$ are the distinct roots, of the equation $x^2 - x + 1 = 0$, then $\alpha^{101} + \beta^{107}$ is equal to: [JEE M 2018]
 (a) 0 (b) 1
 (c) 2 (d) -1
33. Let $p, q \in \mathbb{R}$. If $2 - \sqrt{3}$ is a root of the quadratic equation, $x^2 + px + q = 0$, then: [JEE M 2019- 9 April(M)]
 (a) $p^2 - 4q + 12 = 0$ (b) $q^2 - 4p - 16 = 0$
 (c) $q^2 + 4p + 14 = 0$ (d) $p^2 - 4q - 12 = 0$