

3 _ B _ Mains

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- 24) The equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ has: (2012)
- infinite number of real roots
 - no real roots
 - exactly one real root
 - exactly four roots
- 25) The real number k for which the equation, $2x^3 + 3x + 4 = 0$ has two distinct real roots in $[0, 1]$ (JEEM2013)
- lies between 1 and 2
 - lies between 2 and 3
 - lies between -1 and 0
 - does not exist.
- 26) The number of values of k , for which the system of equations:
(JEEM2013) $(k+1)x + 8y = 4k$
 $kx + (k+3)y = 3k - 1$
has no solution, is
- infinite
 - 1
 - 2
 - 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 (JEEM2013)
- 1:2:3
 - 3:2:1
 - 1:3:2
 - 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: (JEEM2014)
- $(-2, -1)$
 - $(-\infty, 2) \cup (2, \infty)$
 - $(-1, 0) \cup 0, 1$
 - $(1, 2)$
- 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 (JEEM2014)
- $\frac{\sqrt{34}}{9}$
 - $\frac{2\sqrt{13}}{9}$
 - $\frac{\sqrt{61}}{9}$
 - $\frac{2\sqrt{17}}{9}$
- 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: (JEEM2015)
- 3
 - 3
 - 6
 - 6
- 31) The sum of all real values of x satisfying the equation $(x^2 - 5x + 5)^{x^2 + 4x + 60} = 1$ is : (JEEM2016)
- 6
 - 5
 - 3
 - 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 : (JEEM2018)
- 0
 - 1
 - 2
 - 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: (JEEM2019 - 9April(M))
- $p^2 - 4q + 12 = 0$
 - $q^2 + 4p + 14 = 0$
 - $q^2 - 4p - 16 = 0$
 - $p^2 - 4q - 12 = 0$