

3. B.Mains

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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:
[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) $p^2 - 4q - 12 = 0$

