MATHS

BOOKS - JEE MAINS PREVIOUS YEAR

COMPLEX NUMBERS AND QUADRATIC EQUATIONS

Others

1. If the difference between the roots of the equation $x^2 + ax + 1 = 0$ is less than $\sqrt{5}$,

then the set of possible values of a is (1) $(-3, 3)$ (2) $(-3, \infty)$ (3) $(3, \infty)$ (4) $(-\infty, -3)$

A. $(-3, 3)$

B. $(-3, \infty)$

C. $(3, \infty)$

D. $(-\infty, -3)$

Answer: null

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2. If $|z+4| \leq 3$, then the maximum value of $|z+1|$ is (1) 4 (B) 10 (3) 6 (4) 0

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3. If the roots of the equation $bx^2 + cx + a = 0$ be imaginary, then for all real values of x, the expression $3b^2x^2 + 6bcx + 2c^2$ is (1) greater than 4ab (2) less than 4ab (3) greater than $4ab$ (4) less than $4ab$

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4. If $\left|z-\frac{4}{z}\right|=2$, then the maximum value of $|Z|$ is equal to (1) $\sqrt{3}+1$ (2) $\sqrt{5}+1$ (3) 2 (4) $2+\sqrt{2}$

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5. Let α, β be real and z be a complex number. If $z^2+\alpha z+\beta=0$ has two distinct roots on the line Re $z=1$, then it is necessary that : (1)

$b \in (0, 1)$ (2) $b \in (-1, 0)$ (3) $|b| = 1$ (4)

$b \in (1, \infty)$

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6. If z is a complex number of unit modulus and argument q, then $arg\left(\frac{1+z}{1+\bar{z}}\right)$ equal (1) $\frac{\pi}{2} - \theta$ (2) θ (3) $\pi - \theta$ (4) $-\theta$

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7. The real number k for which the equation, $2x^3 + 3x + k = 0$ has two distinct real roots in [0, 1] (1) lies between 2 and 3 (2) lies between -1 and 0 (3) does not exist (4) lies between 1 and 2

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8. A complex number z is said to be unimodular if . Suppose z_1 and z_2 are complex numbers such that $\frac{z_1 - 2z_2}{2 - z_1 z_2}$ is unimodular

and z_2 is not unimodular. Then the point z_1 lies on a : (1) straight line parallel to x-axis (2) straight line parallel to y-axis (3) circle of radius 2 (4) circle of radius $\sqrt{2}$

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9. Let α and β be the roots of equation $x^2 - 6x - 2 = 0$. If $a_n = \alpha^n - \beta^n$, f or $n \geq 1$, then the value of $\frac{a_{10} - 2a_8}{2a_9}$ is equal to: (1) 6 (2) -6 (3) 3 (4) -3

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10. A value of θ for which $\dfrac{2+3i\sin\theta}{1-2i\sin\theta}$ purely imaginary, is : (1) $\dfrac{\pi}{3}$ (2) $\dfrac{\pi}{6}$ (3) $\sin^{-1}\left(\dfrac{\sqrt{3}}{4}\right)$ (4) $\sin^{-1}\left(\dfrac{1}{\sqrt{3}}\right)$

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11. Let ω be a complex number such that $2\omega+1=i\sqrt{3}$. If $\begin{vmatrix}1 & 1 & 1\\ 1 & -\omega^2-1 & \omega^2\\ 1 & \omega^2 & \omega^7\end{vmatrix}=3k$, then k is equal to

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