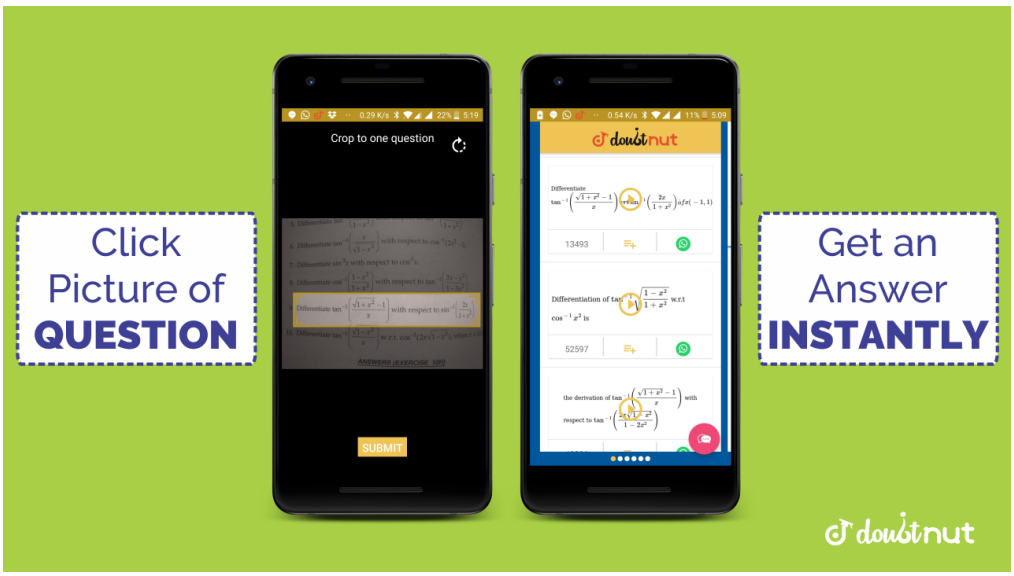
JEE ADVANCED SUPER 25 REVISION SERIES

COMPLEX NUMBERS

Ques No.	Question
1 - 23528	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** Let $a, b, xandy$ be real numbers such that $a-b=1andy \neq 0$. If the complex number $z=x+iy$ satisfies $Im\left(\frac{az+b}{z+1}\right)=y$, then which of the following is (are) possible value9s) of x? (a) $-1-\sqrt{1-y^2}$ (b) $1+\sqrt{1+y^2}$ (c)$-1+\sqrt{1-y^2}$ (d) $-1-\sqrt{1+y^2}$ Watch Free Video Solution on Doubtnut
2 - 28539	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $z^4+1=\sqrt{3}i$ (A) z^3 is purely real (B) z represents the vertices of a square of side $2^{\frac{1}{4}}$ (C) z^9 is purely imaginary (D) z represents the vertices of a square of side $2^{\frac{3}{4}}$ Watch Free Video Solution on Doubtnut
3 - 28706	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $\|z\|=1andz \neq \pm 1$, then all the values of $\frac{z}{1-z^2}$ lie on a line not passing through the origin $\|z\|=\sqrt{2}$ the x-axis (d) the y-axis Watch Free Video Solution on Doubtnut
4 - 28747	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If the cube roots of unity are $1, \omega, \omega^2$, then the roots of the equation $(x-1)^3+8=0$ are

	$-1, 1+2\omega, 1+2\omega^2$ b. $-1, 1-2\omega, 1-2\omega^2$ c. $-1, \ -1, \ -1$ d. none of these Watch Free Video Solution on Doubtnut
5 - 28816	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If ω is an imaginary cube root of unity, then $\left(1+\omega-\omega^2\right)^7$ is equal to 128ω (b) -128ω $128\omega^2$ (d) $-128\omega^2$ Watch Free Video Solution on Doubtnut
6 - 28833	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** Express the following in $a+ib$ form: $\frac{(\cos 2\theta - i\sin 2\theta)^4(\cos 4\theta + i\sin 4\theta)^{-5}}{(\cos 3\theta + i\sin 3\theta)^{-2}(\cos 3\theta - i\sin 3\theta)^{-9}}$ Watch Free Video Solution on Doubtnut
7 - 29013	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $x=\omega-\omega^2-2$ then , the value of $x^4+3x^3+2x^2-11x-6$ is (where ω is a imaginary cube root of unity) Watch Free Video Solution on Doubtnut
doubtnut पढ़ना हुआ आसान	
8 - 29073	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $\lvert z-1\rvert \le 2 and \lvert \omega z-1-\omega^2\rvert = a$ where ω is cube root of unity , then complete set of values of a is $0 \le a \le 2$ b. $\frac{1}{2} \le a \le \frac{\sqrt{3}}{2}$ c. $\frac{\sqrt{3}}{2} - \frac{1}{2} \le a \le \frac{1}{2} + \frac{\sqrt{3}}{2}$ d. $0 \le a \le 4$ Watch Free Video Solution on Doubtnut
9 - 29084	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** The common roots of the equation $Z^3+2Z^2+2Z+1=0$ and $Z^{1985}+Z^{100}+1=0$ are Watch Free Video Solution on Doubtnut

10 - 29100	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** Let $z_k = \cos\left(2k\frac{\pi}{10}\right) + i\sin\left(2k\frac{\pi}{10}\right); k = 1, 2, 34, ..., 9$ (A) For each z_k there exists a z_j such that $z_k . z_j = 1$ (ii) there exists a $k \in \{1, 2, 3, ..., 9\}$ such that $z_1 z = z_k$ Watch Free Video Solution on Doubtnut
11 - 29102	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** Find the complex number satisfying the system of equations $z^3 + \omega^7 = 0 and z^5\omega^{11} = 1.$ Watch Free Video Solution on Doubtnut
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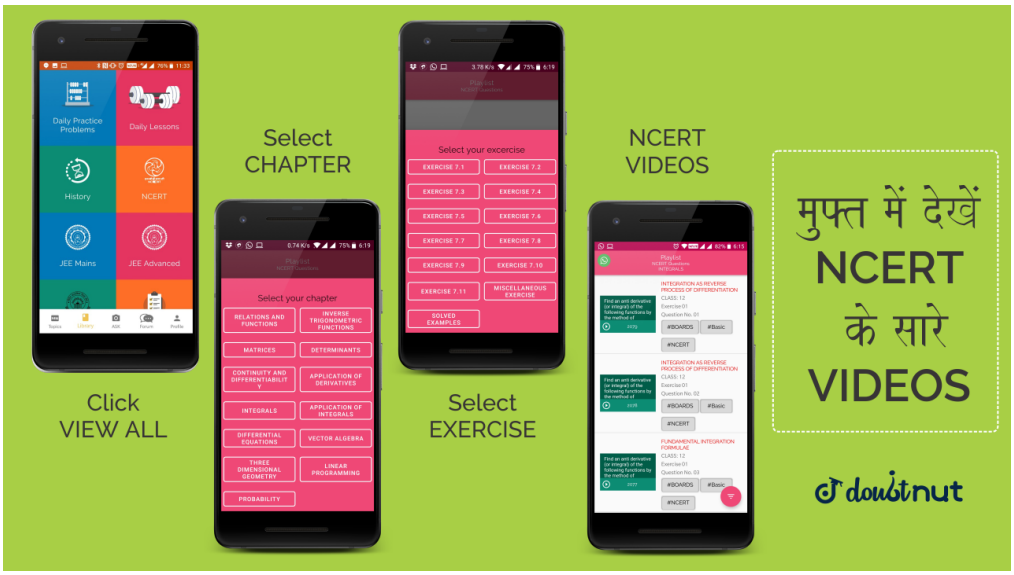
12 - 29184	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $z = i\log(2 - \sqrt{3})$, then a. $\cos z = -1$ b. $\frac{-1}{2}$ c. 1 d. $\frac{1}{2}$ Watch Free Video Solution on Doubtnut
13 - 29195	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If $iz^4 + 1 = 0$, then prove that z can take the value $\cos\pi/8 + i\sin\pi/8$. Watch Free Video Solution on Doubtnut
14 - 29293	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** If n is n odd integer that is greater than or equal to 3 but not a multiple of 3, then prove that $(x+1)^n = x^n - 1$ is divisible by $x^3 + x^2 + x$. Watch Free Video Solution on Doubtnut
15 - 29295	**JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS** Find the complex number ω satisfying the equation $z^3 = 8i$ and lying in the second quadrant on the complex plane. Watch Free Video Solution on Doubtnut



16 - 182624

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Let complex numbers α and $\frac{1}{\alpha}$ lies on circles $(x-x_0)^2+(y-y_0)^2=r^2$ and $(x-x_0)^2+(y-y_0)^2=4r^2$ respectively. If $z_0=x_0+iy_0$ satisfies the equation $2|z_0|^2=r^2+2$ then $|\alpha|$ is equal to

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17 - 182685

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Let w = $(\sqrt{3}+i\frac{)}{2}$ and $P=\{w^n: n=1,2,3,....\}$, Further $H_1=\left\{z\in C: Re(z)>\frac{1}{2}\right\}$ and $H_2=\left\{z\in c: Re(z)<-\frac{1}{2}\right\}$ Where C is set of all complex numbers. If $z_1\in P\cap H_1$, $z_2\in P\cap H_2$ and O represent the origin, then $\angle Z_1OZ_2$ =

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18 - 182732

JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS

Let $z_k=\cos\left(2k\frac{\pi}{10}\right)+i\sin\left(2k\frac{\pi}{10}\right); k=1,2,34,...,9$ (A) For each z_k there exists a z_j such that $z_k.\ z_j=1$ (ii) there exists a $k\in\{1,2,3,...,9\}$ such that $z_1z=z_k$

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19 - 182760

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Let z be a complex number such that the imaginary part of z is nonzero and $a=z^2+z+1$ is real. Then a cannot take the value

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20 - 182799

JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS

If z is any complex number satisfying $|z-3-2i| \leq 2$ then the maximum value of $|2z-6+5i|$ is

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21 - 182867

JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS

Let $\omega = e^{\frac{i\pi}{3}}$ and a, b, c, x, y, z be non-zero complex numbers such that $a+b+c=x, a+b\omega+c\omega^2=y, a+b\omega^2+c\omega=z$.Then, the value of $\frac{|x|^2+|y|^2|+|y|^2}{|a|^2+|b|^2+|c|^2}$

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22 - 182955

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The set of points z $|z-i|z|| = |z+i|z|\ |\ |$ is contained in or equal to

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23 - 183513

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Let A, B, C be three sets of complex number as defined below: $A=\{z: Im>1\}, B=\{z: |z-2|=3\}, C: \{z: Re((1-i)z)=\sqrt{2}\}$ The number of elements in the set $A \cap B \cap C$ is

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24 - 183594

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A particle P starts from the point $z_0 = 1 + 2i,$ where $i = \sqrt{-1}$. It moves first horizontally away from origin by 5 units and then vertically away from origin by 3 units to reach a point $z_{1.}$ From z_1 the particle moves $\sqrt{2}$ units in the direction of the vector $\hat{i} + \hat{j}$ and then it moves through an angle $\frac{\pi}{2}$ in anticlockwise direction on a circle with centre at origin, to reach a point $z_{2.}$ The point z_2 is given by $6 + 7i$ (b) $-7 + 6i$ $7 + 6i$ (d) $-6 + 7i$

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25 - 183733

JEE ADVANCED SUPER 25 REVISION SERIES - COMPLEX NUMBERS

If $|z| = 1 and z \neq \pm 1,$ then all the values of $\frac{z}{1 - z^2}$ lie on a line not passing through the origin $|z| = \sqrt{2}$ the x-axis (d) the y-axis

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