

SIR CV RAMAN COACHING CENTRE- IDAPPADI ,

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XII- MATHS EXCERISE 2.5,2.6,2.7. SLIP TEST QUESTION PAPER - 2024

SECTION - A (10 X 5 = 50 M)

ANSWER ANY TEN QUESTIONS

1. If $|z| = 3$, show that $7 \leq |z + 6 - 8i| \leq 13$.

2. If $|z| = 1$, show that $2 \leq |z^2 - 3| \leq 4$.

3. If $|z| = 2$, show that $8 \leq |z + 6 + 8i| \leq 12$.

4. If the area of the triangle formed by the vertices z , iz , and $z + iz$ is 50 square units, find the value of $|z|$.

5. If $z = x + iy$ is a complex number such that $\text{Im}\left(\frac{2z+1}{iz+1}\right) = 0$, show that the locus of z is $2x^2 + 2y^2 + x - 2y = 0$.

6. If $z = x + iy$ is a complex number such that $\left|\frac{z-4i}{z+4i}\right| = 1$ show that the locus of z is real axis.

7. Find the rectangular form of the complex numbers $\frac{\cos \frac{\pi}{6} - i \sin \frac{\pi}{6}}{2\left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}\right)}$.

8. Write in polar form of the following complex numbers $\frac{i-1}{\cos \frac{\pi}{3} + i \sin \frac{\pi}{3}}$.

Find the quotient $\frac{2\left(\cos\frac{9\pi}{4} + i\sin\frac{9\pi}{4}\right)}{4\left(\cos\left(\frac{-3\pi}{2}\right) + i\sin\left(\frac{-3\pi}{2}\right)\right)}$ in rectangular form.

9. . . .

Find the product $\frac{3}{2}\left(\cos\frac{\pi}{3} + i\sin\frac{\pi}{3}\right) \cdot 6\left(\cos\frac{5\pi}{6} + i\sin\frac{5\pi}{6}\right)$ in rectangular form.

10.

Find the principal argument $\text{Arg } z$, when $z = \frac{-2}{1+i\sqrt{3}}$.

11.

Let z_1, z_2 , and z_3 be complex numbers such that $|z_1| = |z_2| = |z_3| = r > 0$ and $z_1 + z_2 + z_3 \neq 0$.

Prove that $\left|\frac{z_1z_2 + z_2z_3 + z_3z_1}{z_1 + z_2 + z_3}\right| = r$.

12.

Show that the points $1, \frac{-1}{2} + i\frac{\sqrt{3}}{2}$, and $\frac{-1}{2} - i\frac{\sqrt{3}}{2}$ are the vertices of an equilateral triangle.

13.

If z_1, z_2 , and z_3 are complex numbers such that $|z_1| = |z_2| = |z_3| = |z_1 + z_2 + z_3| = 1$,

find the value of $\left|\frac{1}{z_1} + \frac{1}{z_2} + \frac{1}{z_3}\right|$.

14.

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