Q. No.	DAY - 9
44	**EXERCISE 2.4** 5. Prove the following properties: (i) z is real if and only if $z = \overline{z}$ (ii) $\text{Re}(z) = \dfrac{z+\overline{z}}{2}$ and $\text{Im}(z) = \dfrac{z-\overline{z}}{2i}$
45	6. Find the least value of the positive integer n for which $\left(\sqrt{3}+i\right)^n$ (i) real (ii) purely imaginary.
46	7. Show that (i) $\left(2+i\sqrt{3}\right)^{10} - \left(2-i\sqrt{3}\right)^{10}$ is purely imaginary (ii) $\left(\dfrac{19-7i}{9+i}\right)^{12} + \left(\dfrac{20-5i}{7-6i}\right)^{12}$ is real.
47	**Example 2.10** Find the following (i) $\left\lvert\dfrac{2+i}{-1+2i}\right\rvert$ (ii) $\left\lvert\overline{(1+i)}(2+3i)(4i-3)\right\rvert$ (iii) $\left\lvert\dfrac{i(2+i)^3}{(1+i)^2}\right\rvert$
48	**Example 2.11** Which one of the points $i, -2+i$, and 3 is farthest from the origin?

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Example 2.12

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 $\left|\frac{1}{z_1} + \frac{1}{z_2} + \frac{1}{z_3}\right|$.