

1 a) Resuelve la ecuación: $x^2 - (2 + 2i)x + 2i - 1 = 0$.

b) Calcula $(i^{20} + i^{35} - i^{462}) \cdot i^7$

2 Eleva al cubo $\sqrt{3} - i$ y expresa el resultado de todos los modos posibles.

3 Escribe una ecuación de segundo grado cuyas raíces sean 260° y 2300° .

4 Siendo $z = 4\sqrt{2} + 4\sqrt{2}i$. Se pide calcular $\sqrt[3]{z}$

5 Calcular: $\sqrt[4]{8 + 8\sqrt{3}i}$

$$\textcircled{1} \quad x = \frac{(2+2i) \pm \sqrt{(2+2i)^2 - 4 \cdot (2i-1)}}{2} = \frac{2+2i \pm \sqrt{4+4i^2+8i-8i+4}}{2} =$$

$$= \frac{2 \pm 2i \pm \sqrt{4}}{2} = 1 + i \pm 1 = \left\{ \begin{array}{l} \underline{2+i} \\ \underline{i} \end{array} \right.$$

$$\text{b) } \left. \begin{array}{l} i^{20} = i^0 = 1 \\ i^{35} = -i \\ i^{462} = i^2 = -1 \\ i^7 = i^3 = -i \end{array} \right\} \begin{array}{l} [1 - i - (-1)] \cdot (-i) = \\ = [1 - i + 1] \cdot (-i) = \\ = 1 - i - i = \underline{\underline{-1 - 2i}} \end{array}$$

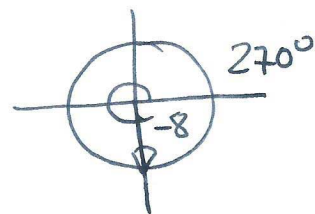
$$\begin{array}{r} 35 \overline{) 4} \\ 3 \underline{8} \end{array}$$

$$\begin{array}{r} 462 \overline{) 4} \\ 06 \underline{22} \\ 2 \end{array}$$

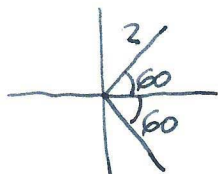
$$\textcircled{2} \quad (\sqrt{3} - i)^3 = 1(\sqrt{3})^3 - 3(\sqrt{3})^2 i + 3\sqrt{3}i^2 - 1i^3 =$$

$$= 3\sqrt{3} - 9i - 3\sqrt{3} + i = 0 - 8i = -8i$$

$$= (0, -8) = 8_{270^\circ} = 8(\cos 270^\circ + i \sin 270^\circ)$$



$$\textcircled{3} \quad 2_{600} \quad 2_{300} \quad 2_{60} = \left\{ \begin{array}{l} a = 2 \cos 60 = 2 \cdot \frac{1}{2} = 1 \\ b = 2 \sin 60 = 2 \cdot \frac{\sqrt{3}}{2} = \sqrt{3} \end{array} \right\} \quad 1 + \sqrt{3}i$$



$$2_{300} \left\{ \begin{array}{l} a = 2 \cos 300 = 2 \cdot \frac{1}{2} = 1 \\ b = 2 \sin 300 = -2 \cdot \frac{\sqrt{3}}{2} = -\sqrt{3} \end{array} \right\} \quad 1 - \sqrt{3}i$$

La ecuación será

$$[x - (1 + \sqrt{3}i)] \cdot [x - (1 - \sqrt{3}i)] = 0 = (x - 1 - \sqrt{3}i)(x - 1 + \sqrt{3}i) = 0$$

$$= (x-1)^2 - (\sqrt{3}i)^2 = x^2 + 1 - 2x - 3(-1) = \underline{\underline{x^2 - 2x + 4 = 0}}$$

$$\textcircled{4} \quad z = 4\sqrt{2} + 4\sqrt{2}i \quad r = \sqrt{16.2 + 16.2} = \sqrt{64} = 8$$

$$\alpha = \arctan \frac{b}{a} = \arctan 1 = 45^\circ \quad 8_{45^\circ}$$

$$\sqrt[3]{8}_{45^\circ} = 2_{15^\circ}, 2_{135^\circ}, 2_{255^\circ}$$

$$\textcircled{5} \quad \sqrt[4]{8+8\sqrt{3}i}$$

$$8+8\sqrt{3}i \Rightarrow r = \sqrt{64+192} = \sqrt{16} = 4$$

$$\sqrt[4]{4}_{60^\circ}$$

$$\alpha = \arctan \frac{8\sqrt{3}}{8} = \arctan \sqrt{3} = 60^\circ$$

$$\text{Solutions } \sqrt{2}_{15^\circ} \quad \sqrt{2}_{105^\circ} \quad \sqrt{2}_{195^\circ} \quad \sqrt{2}_{285^\circ}$$