Tutorial 11

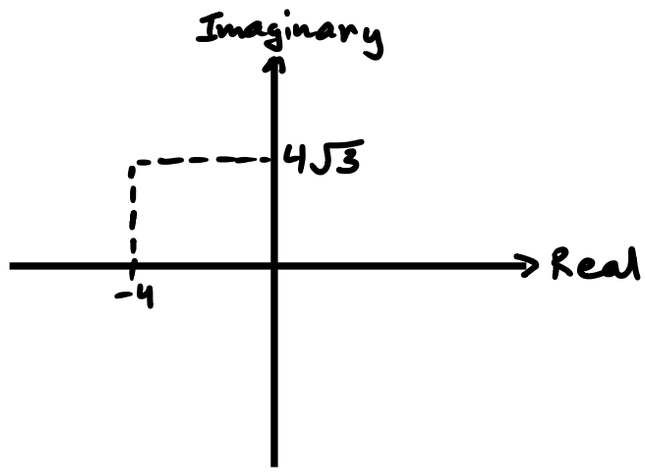
$z = -4 + 4\sqrt{3}\,i$

$\theta = \tan^{-1}\left(\frac{4\sqrt{3}}{-4}\right) + \pi$

$= \tan^{-1}$

$= -\pi/3 + \pi$ ← second quadrant

$= \frac{2\pi}{3}$



$\rightarrow r = |z| = \sqrt{(-4)^2 + (4\sqrt{3})^2}$

$\rightarrow r = \sqrt{16 + (16 \times 3)}$

$\rightarrow r = \sqrt{64}$

$\rightarrow r = 8$

$z = 8e^{i2\pi/3}$ → polar form

$z_k = \sqrt[3]{r}\, e^{i\left(\frac{\theta + 2k\pi}{3}\right)}$ where $k = 0, 1, 2$

where $r = 8$, $\theta = \frac{2\pi}{3}$

$\sqrt[3]{r} = \sqrt[3]{8} = 2$

$\theta_k = \frac{\frac{2\pi}{3} + 2k\pi}{3} = \frac{2\pi}{9} + \frac{2k\pi}{3}$

$\therefore z_0 = 2e^{i\left(\frac{2\pi}{9} + \frac{2(0)\pi}{3}\right)} = 2e^{i(2\pi/9)}$

$z_1 = 2e^{i\left(\frac{2\pi}{9} + \frac{2(1)\pi}{3}\right)} = 2e^{i(8\pi/9)}$

$z_2 = 2e^{i\left(\frac{2\pi}{9} + \frac{2(2)\pi}{3}\right)} = 2e^{i(14\pi/9)}$

} Final Answers