

$$\Leftrightarrow \cos\left(\frac{\alpha}{2}\right) = \frac{-1}{2} \quad \text{أو} \quad \cos\left(\frac{\alpha}{2}\right) = \frac{1}{2}$$

$$\Leftrightarrow \frac{\alpha}{2} \equiv \frac{2\pi}{3}[\pi] \quad \text{أو} \quad \frac{\alpha}{2} \equiv \frac{\pi}{3}[\pi]$$

$$\Leftrightarrow \alpha \equiv \frac{4\pi}{3}[\pi] \quad \text{أو} \quad \alpha \equiv \frac{2\pi}{3}[\pi]$$

$$\Leftrightarrow z_1 = e^{\frac{4i\pi}{3}} \quad \text{أو} \quad z_2 = e^{\frac{2i\pi}{3}}$$

$$\Leftrightarrow z_1 = \frac{-1}{2} - i \frac{\sqrt{3}}{2} \quad \text{أو} \quad z_2 = \frac{-1}{2} + i \frac{\sqrt{3}}{2}$$

■ و الحمد لله رب العالمين ■