

► **R03** Déterminer la forme exponentielle de $z = 2 + \sqrt{3} + i$.

Corrigé

$$\begin{aligned} z &= 2 + \sqrt{3} + i = 2 \left(\frac{\sqrt{3}}{2} + \frac{1}{2}i \right) + 2 \\ &= 2 \left(\cos\left(\frac{\pi}{6}\right) + i \sin\left(\frac{\pi}{6}\right) \right) + 2 = 2e^{i\frac{\pi}{6}} + 2 = 2 \left(e^{i\frac{\pi}{6}} + 1 \right) \\ &= 2e^{i\frac{\pi}{12}} \left(e^{i\frac{\pi}{12}} + e^{-i\frac{\pi}{12}} \right) = 4e^{i\frac{\pi}{12}} \cos\left(\frac{\pi}{12}\right) = 4 \cos\left(\frac{\pi}{12}\right) e^{i\frac{\pi}{12}} \end{aligned}$$

Conclusion :

$$z = 4 \cos\left(\frac{\pi}{12}\right) e^{i\frac{\pi}{12}}$$

