

Question 4

a)

(iv) If $z_1 = 2 \left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right)$ and $z_2 = 2 \left(\cos \frac{\pi}{6} + i \cos \frac{\pi}{6} \right)$ then

$$\begin{aligned} & \frac{z_1}{z_2} \\ &= \frac{2 \left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right)}{2 \left(\cos \frac{\pi}{6} + i \cos \frac{\pi}{6} \right)} \\ &= \left(\cos \left(\frac{\pi}{3} - \frac{\pi}{6} \right) + i \sin \left(\frac{\pi}{3} - \frac{\pi}{6} \right) \right) \\ &= \left(\cos \left(\frac{\pi}{6} \right) + i \sin \left(\frac{\pi}{6} \right) \right) \\ &= \frac{\sqrt{3}}{2} + i \frac{1}{2} \end{aligned}$$