Question 4

a)

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

$$\dfrac{z_1}{z_2}$$

$$= \dfrac{2\left(\cos\dfrac{\pi}{3} + i\sin\dfrac{\pi}{3}\right)}{2\left(\cos\dfrac{\pi}{6} + i\cos\dfrac{\pi}{6}\right)}$$

$$= \left(\cos\left(\dfrac{\pi}{3} - \dfrac{\pi}{6}\right) + i\sin\left(\dfrac{\pi}{3} - \dfrac{\pi}{6}\right)\right)$$

$$= \left(\cos\left(\dfrac{\pi}{6}\right) + i\sin\left(\dfrac{\pi}{6}\right)\right)$$

$$= \dfrac{\sqrt{3}}{2} + i\dfrac{1}{2}$$