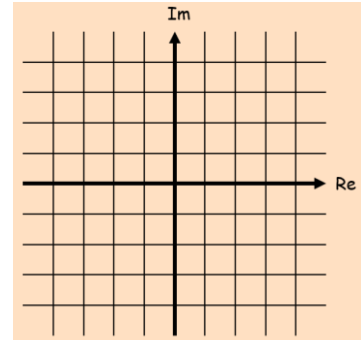


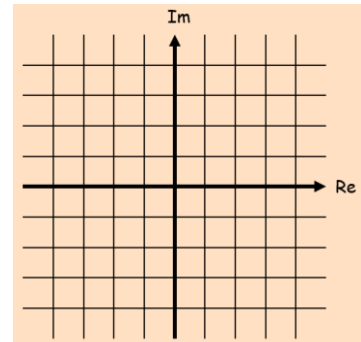
1A Exponential Form

1. Express the numbers following numbers in the modulus argument form:

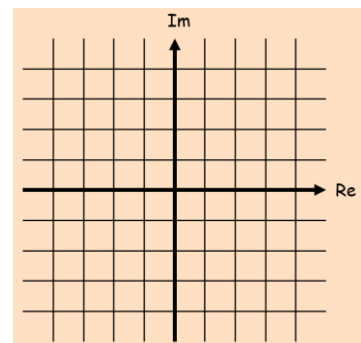
a) $z_1 = 1 + i\sqrt{3}$



b) $z_2 = -3 - 3i$



2. Express the complex number $z = 2 - 3i$ in the form $re^{i\theta}$, where $-\pi < \theta \leq \pi$



3. Express the following in the form $z = re^{i\theta}$ where $-\pi < \theta \leq \pi$

a) $z = \sqrt{2} \left(\cos\left(\frac{\pi}{10}\right) + i \sin\left(\frac{\pi}{10}\right) \right)$

b) $z = 5 \left(\cos\left(\frac{\pi}{8}\right) - i \sin\left(\frac{\pi}{8}\right) \right)$

4. Express the following in the form $z = x + iy$ where $x \in \mathbb{R}$ and $y \in \mathbb{R}$

$$z = \sqrt{2} e^{\frac{3\pi}{4}i}$$

5. Express the following in the form $r(\cos\theta + i\sin\theta)$, where $-\pi < \theta \leq \pi$

$$z = 2e^{\frac{23\pi}{5}i}$$

6. Use: $e^{i\theta} = \cos\theta + i\sin\theta$ To show that: $\cos\theta = \frac{1}{2}(e^{i\theta} + e^{-i\theta})$