

7. (a) Determine the roots of the equation

$$z^6 = 1$$

giving your answers in the form $e^{i\theta}$ where $0 \leq \theta < 2\pi$

(2)

(b) Show the roots of the equation in part (a) on a single Argand diagram.

(2)

(c) Show that

$$(\sqrt{3} + i)^6 = -64$$

(2)

(d) Hence, or otherwise, solve the equation

$$z^6 + 64 = 0$$

giving your answers in the form $re^{i\theta}$ where $0 \leq \theta < 2\pi$

(3)