

3.31
3

$$z^4 + 2 - i\sqrt{12} = 0$$

$$z^4 = -2 + i\sqrt{12}$$

$$r = \sqrt{4+12} = 4$$

$$\tan \theta = \frac{\sqrt{12}}{-2} = -\sqrt{3} \rightarrow \theta = -60^\circ \rightarrow \text{Polar form} \rightarrow \text{if } \theta = 120$$

$$z^4 = 4 \text{ cis}(120)$$

$$z_i = \sqrt[4]{4} \text{ cis}\left(\frac{120 + 360k}{4}\right)$$

$$z_0 = \sqrt{2} \text{ cis}(30)$$

$$z_1 = \sqrt{2} \text{ cis}(120)$$

$$z_2 = \sqrt{2} \text{ cis}(210)$$

$$z_3 = \sqrt{2} \text{ cis}(300)$$