

3.81  
p8

$$z^6 = -4 + 4\sqrt{3}i = 8 \operatorname{cis} 120 = 8 \operatorname{cis} \frac{2\pi}{3}$$

$$r = \sqrt{(-4)^2 + (4\sqrt{3})^2} = 8$$

$$\tan \theta = \frac{4\sqrt{3}}{-4} = -\sqrt{3} \rightarrow \theta = 120$$

3.81  
p9

$$z = \sqrt{2} \operatorname{cis} \left( \frac{\pi}{4} + \frac{2\pi k}{3} \right) \quad k = 0, 1, 2, 3, 4, 5$$

$$3 < |z| \leq 4 \rightarrow$$

$$9 \leq x^2 + y^2 \leq 16$$

$$\operatorname{Im} z^2 \leq 1 \rightarrow$$

$$2xy \leq 1 \rightarrow y \leq \frac{1}{2x}$$

