
Problem 2.7 (Engel)

A. Express $2-4i$ in the form $re^{i\theta}$.

Magnitude, r . $= \sqrt{a^2 + b^2} = \sqrt{2^2 + 4^2}$

$$r = \sqrt{2^2 + 4^2}$$

$$2\sqrt{5}$$

Angle, θ . $= \arccos(a/r) = \arccos(2/(2\sqrt{5}))$

$$\theta = \text{ArcCos}[2. / r]$$

$$1.10715$$

$$\theta / \pi$$

$$0.352416$$

B. Express 6 in the form $re^{i\theta}$.

Magnitude, r . $= \sqrt{a^2 + b^2} = \sqrt{6^2 + 0^2}$

$$r = 6$$

$$6$$

Angle, θ . $= \arccos(a/r) = \arccos(6/6)$

$$\theta = \text{ArcCos}[6. / r]$$

$$0.$$