Problem 1.5

Express the complex vector $4 + 3i$ in the exponential form $Ae^{i\theta}$.

Solution

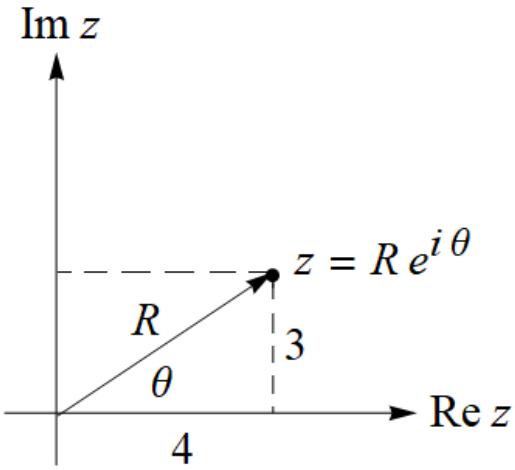

Figure 1: This figure shows the vector $z = 4 + 3i$ in the complex plane.

$$R = \sqrt{4^2 + 3^2} = 5$$
$$\theta = \tan^{-1}\frac{3}{4} \approx 0.6435$$

Therefore,

$$4 + 3i = 5\exp\left(i\tan^{-1}\frac{3}{4}\right).$$