Problem 1

Compute

a) $(3+4i)\cdot(1-2i)$,

b) $e^{i2\pi/3}+e^{-i2\pi/3}$,

c) the argument of $\frac{(1+i)^3}{1-i}$.

Solution

Problem 2

Sketch the region

$$\Re(z^2)=1$$

and argue why the region sketched is correct.

Solution

Problem 3

Compute $(1+i)^n+(1-i)^n$ in terms of cosine. For what n is this quantity zero?

Hint: It may be useful to recall that any complex number $z\in\mathbb{C}$ can be expressed as $z=re^{i\theta}$ for suitable r,θ.

You may also need to recall Euler's formula $e^{i\theta}=\cos\theta+i\sin\theta$.

Solution