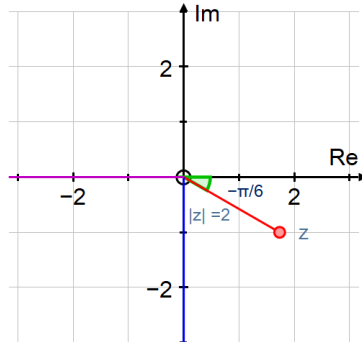


Find the values of n such that $(\sqrt{3} - i)^n$ is a **real** number

$$\text{Let } z = \sqrt{3} - i$$

$$|z| = \sqrt{3 + 1} = 2$$

$$\arg(z) = -\frac{\pi}{6}$$



$$z = 2cis\left(-\frac{\pi}{6}\right)$$

$$z^n = 2^n cis\left(-\frac{n\pi}{6}\right)$$

$$\arg(z^n) = -\frac{n\pi}{6}$$

z^n will be real when $\arg(z^n) = k\pi$

$$n = 6, 12, 18, \dots$$

$$n = 6k, k \in \mathbb{Z}$$