

$$x + yi = r(\cos\theta + i\sin\theta)$$

$$r = ?$$

$$a + bi = \sqrt{a^2 + b^2}$$

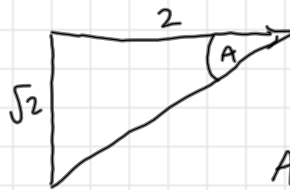
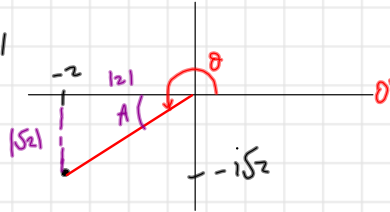
$$\theta = ?$$

Change to Polar Form

$$-2 - i\sqrt{2}$$

$$r = \sqrt{2^2 + (\sqrt{2})^2} = \sqrt{4+2} = \sqrt{6}$$

SKETCH



$$\tan A = \frac{\sqrt{2}}{2}$$

$$A = \tan^{-1}\left(\frac{\sqrt{2}}{2}\right) \approx 35^\circ$$

$$\theta = 180 + A = 215^\circ$$

$$= \sqrt{6}(\cos 215^\circ + i\sin 215^\circ)$$

POLAR FORM

$$x + iy = r(\cos\theta + i\sin\theta)$$

$$r = \sqrt{x^2 + y^2}$$

$$\theta = ? \quad 300^\circ \text{ or } (-60^\circ)$$

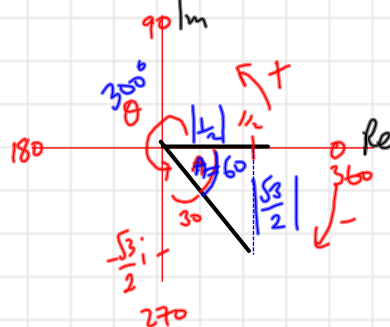
DEG \rightarrow RAD

$$300^\circ = \frac{5\pi}{3}$$

$\frac{1}{2} - \frac{\sqrt{3}}{2}i$ write in Polar form?

$$r = \sqrt{\left(\frac{1}{2}\right)^2 + \left(-\frac{\sqrt{3}}{2}\right)^2} = \sqrt{\frac{1}{4} + \frac{3}{4}} = \sqrt{1} = 1$$

Sketch



$$\tan A = \frac{\left(\frac{\sqrt{3}}{2}\right)}{\left(\frac{1}{2}\right)} = \sqrt{3}$$

$$A = \tan^{-1}\sqrt{3} = 60^\circ$$

$$= 1(\cos 300^\circ + i\sin 300^\circ)$$

$$= \cos \frac{5\pi}{3} + i\sin \frac{5\pi}{3}$$