

Precalculus

7-07 Polar Coordinates

Polar coordinates

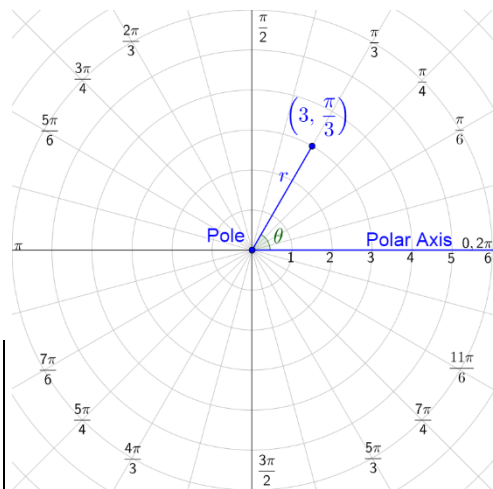
- (r, θ)
 - $r =$ _____ from _____
 - $\theta =$ angle _____ from _____ axis

Graph

$$A \left(4, \frac{\pi}{4} \right)$$

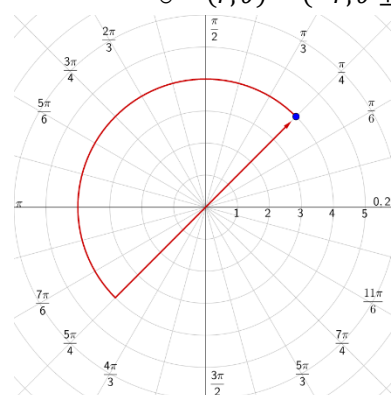
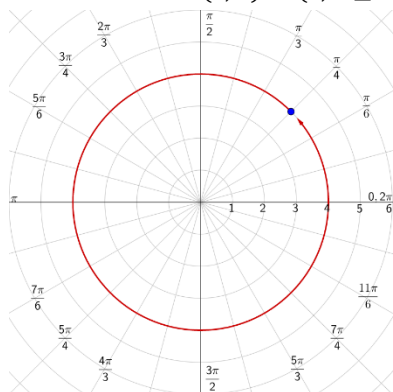
$$B \left(-5, \frac{2\pi}{3} \right)$$

$$C \left(3, -\frac{\pi}{6} \right)$$



Multiple ways to represent same point

- Add _____ circles
 - $(r, \theta) = (r, \theta \pm 2\pi n)$
- _____ side of circle and add _____ circle
 - $(r, \theta) = (-r, \theta \pm (2n + 1)\pi)$



Find 2 other ways to write $\left(3, \frac{\pi}{4} \right)$.

Convert between polar and rectangular

Polar → Rectangular

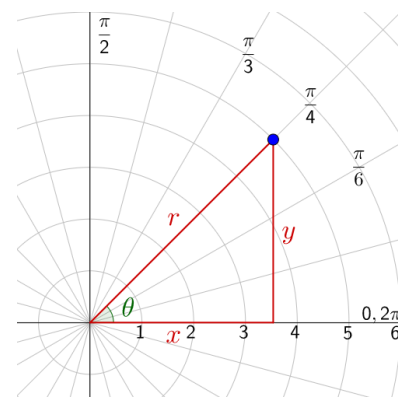
$$x = r \cos \theta$$

$$y = r \sin \theta$$

Rectangular → Polar

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

$$\tan \theta = \frac{y}{x}$$

Convert $(4, \frac{\pi}{6})$ to rectangularConvert $(-1, 0)$ to polar**Convert Equations**Convert $r = 1$ Convert $\theta = \frac{\pi}{4}$ Convert $r = \csc \theta$