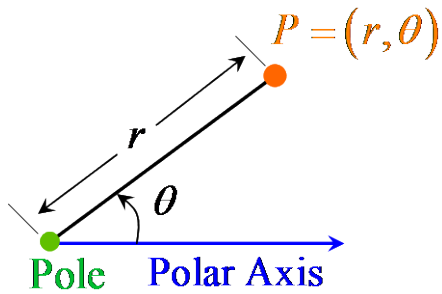


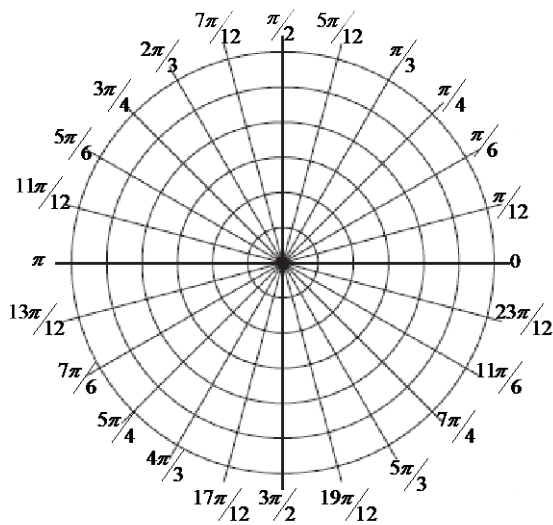
Polar Coordinates (6.3)



To plot a Polar Coordinate:

1. Begin with θ and go counterclockwise for a positive angle and clockwise for a negative angle from the polar axis.
2. When arriving at the terminal side, plot the point r units away from the pole.

Plotting Polar Coordinates (Radians) Use a polar coordinate system to plot each point with the given polar coordinates.



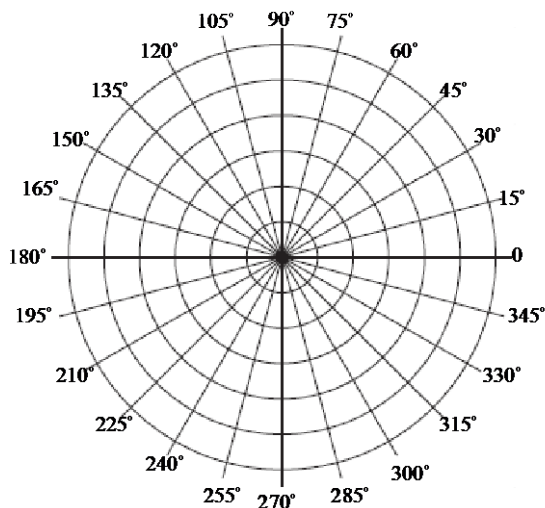
1. $A\left(2, \frac{2\pi}{3}\right)$

2. $B\left(-3, \frac{5\pi}{4}\right)$

3. $C\left(4, -\frac{3\pi}{2}\right)$

4. $D\left(-1, -\frac{5\pi}{6}\right)$

Plotting Polar Coordinates (Degrees) Use a polar coordinate system to plot each point with the given polar coordinates.



5. $A(-3, 210^\circ)$

6. $B(5, -60^\circ)$

7. $C(0, -150^\circ)$

8. $D(-2, 0^\circ)$

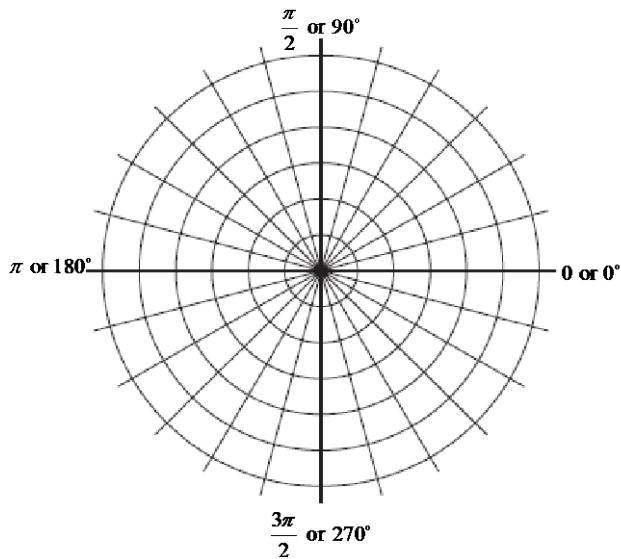
Finding Other Polar Coordinates for a Given Point: Use a polar coordinate system to plot each point with the given polar coordinates. Then find another representation of this point in which

a. $r > 0, 2\pi < \theta < 4\pi$

b. $r < 0, 0 < \theta < 2\pi$

c. $r > 0, -2\pi < \theta < 0$

9. $\left(4, \frac{\pi}{6}\right)$



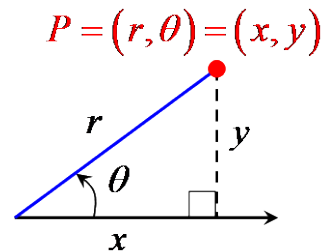
Relations between Polar and Rectangular Coordinates

$$x = r \cos \theta$$

$$y = r \sin \theta$$

$$x^2 + y^2 = r^2$$

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



Converting from Polar to Rectangular: Polar Coordinates of a point are given. Find the rectangular coordinates of each point.

10. $\left(2, \frac{2\pi}{3}\right)$

11. $\left(-3, -\frac{5\pi}{4}\right)$

Converting from Rectangular to Polar: Rectangular Coordinates of a point are given. Find the polar coordinates of each point.

12. $(-1, -\sqrt{3})$

13. $(-2\sqrt{3}, 2)$

Converting Equations from Polar to Rectangular Form: Convert each polar equation to a rectangular equation.

14. $r \cos \theta = 7$

15. $r = 8 \cos \theta + 2 \sin \theta$

Converting Equations from Rectangular to Polar Form: Convert each rectangular equation to a polar equation.

16. $(x-5)^2 + y^2 = 25$

17. $2x - 3y = 1$