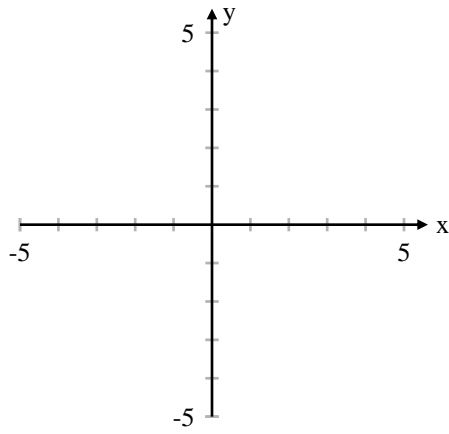


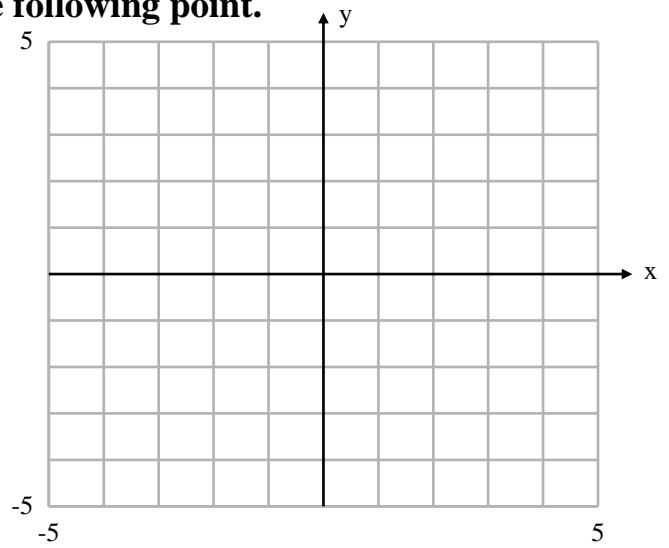
6.4 Polar Coordinates:

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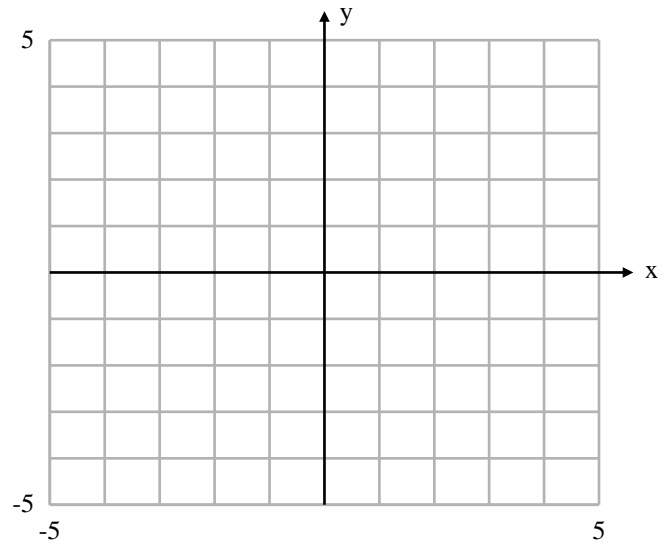


1. Find the rectangular coordinates of the following point.

$$\left(-1, 315^\circ\right)$$



2. Plot the polar coordinates $\left(2, \frac{5\pi}{6}\right)$.



6.4 Polar Coordinates:

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Finding all Polar Coordinates of a Point

Let P have polar coordinates (r, θ) . Any other polar coordinate of P must be of the form

$$\left(\quad \quad \right) \text{ or } \left(\quad \quad \right)$$

Where n is any integer. In particular, the pole has polar coordinates $(0, \theta)$, where θ is any angle.

3. Find all of the polar coordinates of $\left(1, -\frac{\pi}{4}\right)$.

Coordinate Conversion Equations

Let the point P have polar coordinates (r, θ) and rectangular coordinates (x, y) .

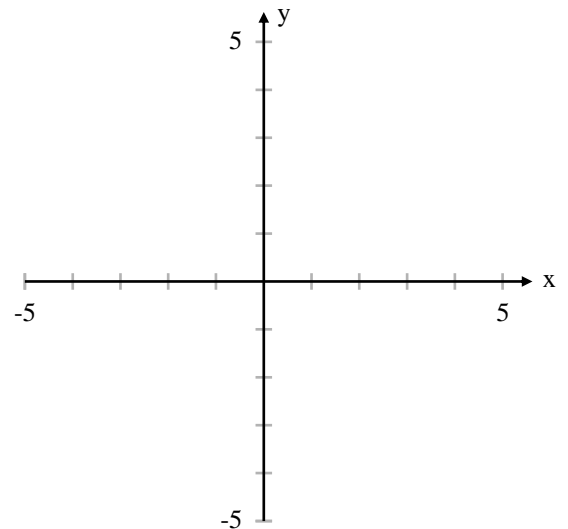
Then

$$x =$$

$$r^2 =$$

$$y =$$

$$\tan \theta =$$



6.4 Polar Coordinates:

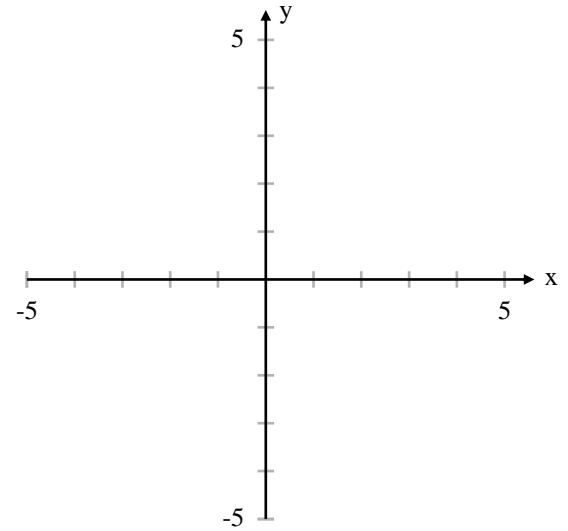
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4. Find all of the polar coordinates of $(1,3)$.

a. $0 \leq \theta \leq 2\pi$

b. $-\pi \leq \theta \leq \pi$

c. $0 \leq \theta \leq 4\pi$



5. Convert the polar equation to rectangular form and identify the graph.

$$r = 6 \sin \theta$$

6. Convert the polar equation to rectangular form and identify the graph.

$$r = -2 \csc \theta$$

7. Convert the rectangular equation to polar form and identify the graph.

$$x = 5$$

8. Convert the rectangular equation to polar form and identify the graph.

$$x^2 + (y - 1)^2 = 1$$