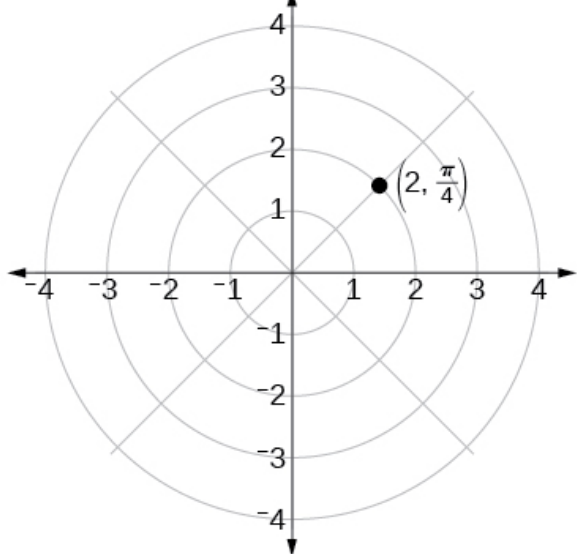
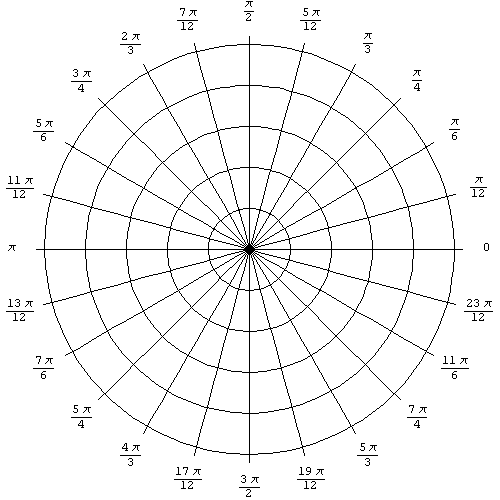
**10.3 – Polar Coordinates**

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In this section, we introduce to polar coordinates, which are points labeled (, ) and plotted on a polar grid. The polar grid is represented as a series of concentric circles radiating out from the pole, or the origin of the coordinate plane.

The polar grid is scaled as the unit circle with the positive *\_\_\_\_-*axis now viewed as the \_\_\_\_\_\_\_\_\_\_\_\_\_ axis and the origin as the pole. The first coordinate *r* is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or length of the directed line segment from the pole. The angle *θ*, measured in radians, indicates the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of *r*. We move counterclockwise from the polar axis by an angle of *θ*, and measure a directed line segment the length of *r* in the direction of *θ*. Even though we measure *θ* first and then *r*, the polar point is written with the *r*-coordinate first.

**Examples**

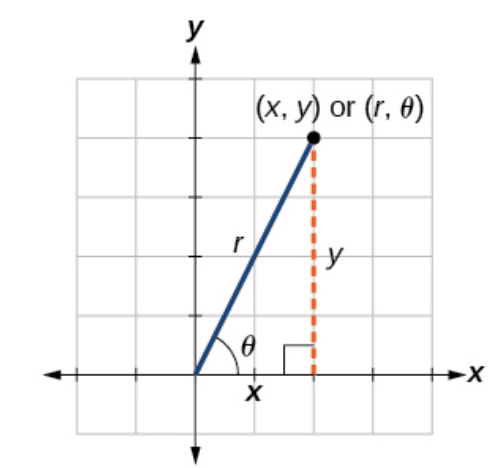


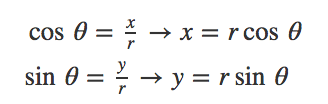


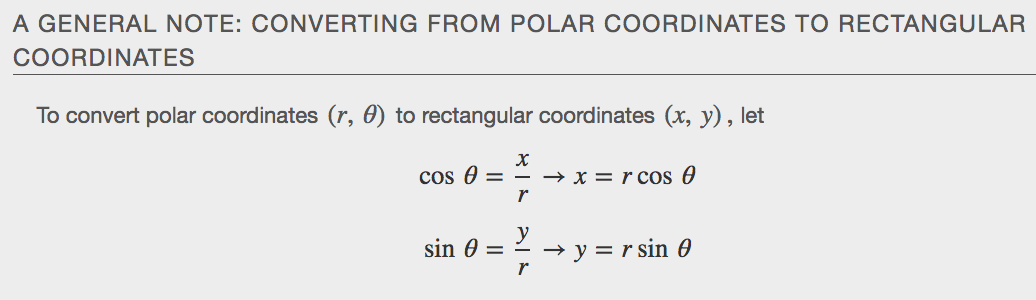


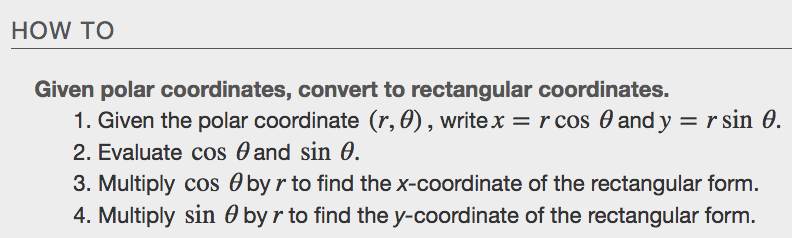


**Converting from Polar Coordinates to Rectangular Coordinate**

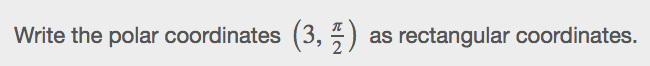
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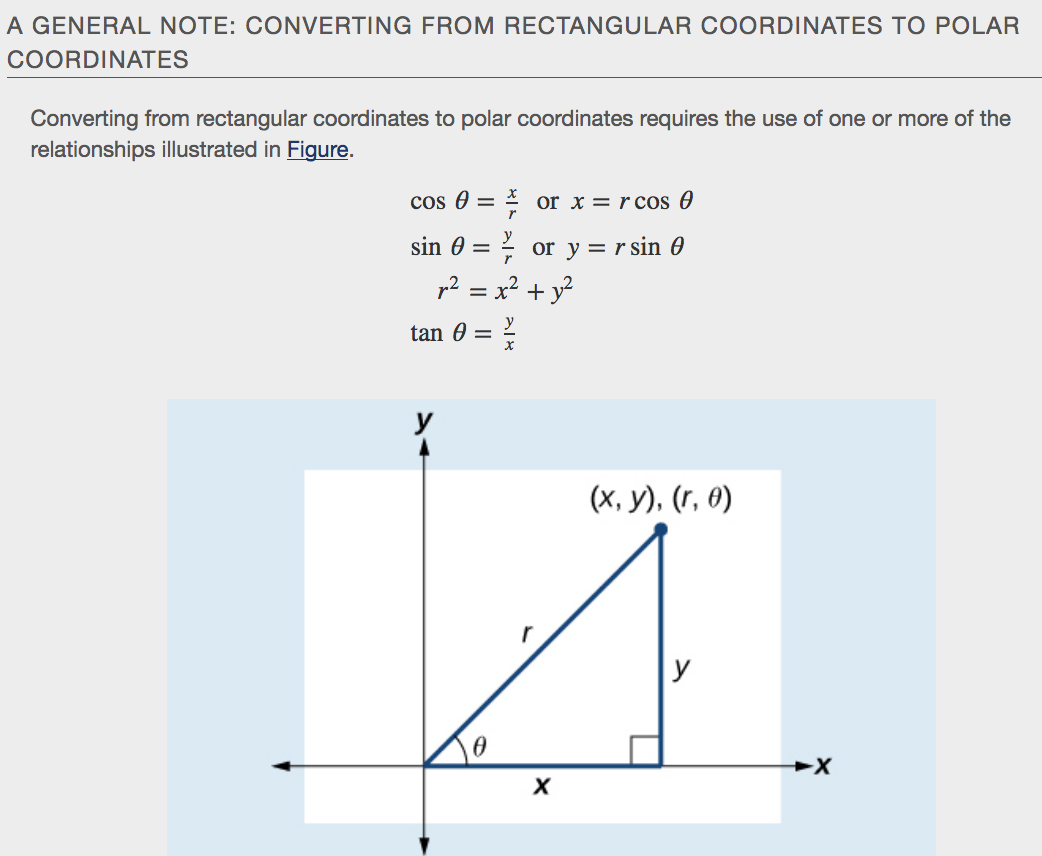
**Examples**

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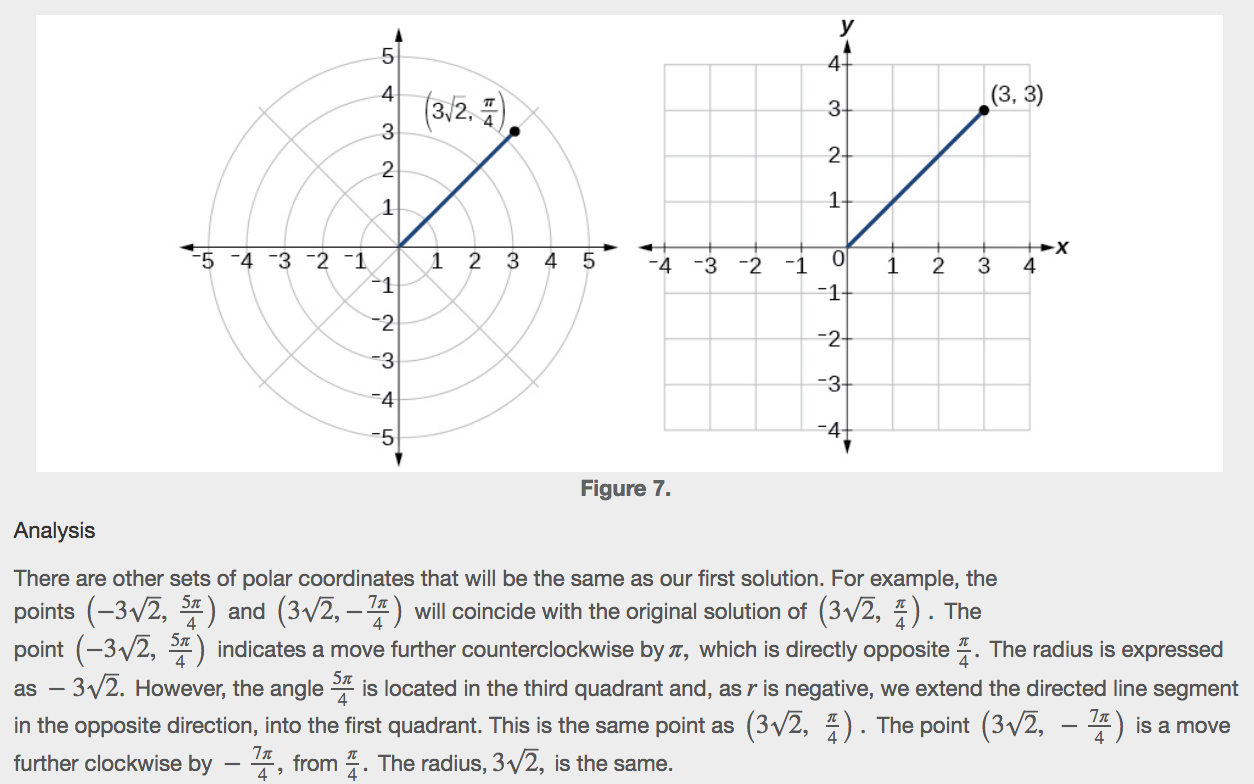
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**Converting from Rectangular Coordinates to Polar Coordinates**

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**Example**

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**Transforming Equations between Polar and Rectangular Forms**

**Examples**

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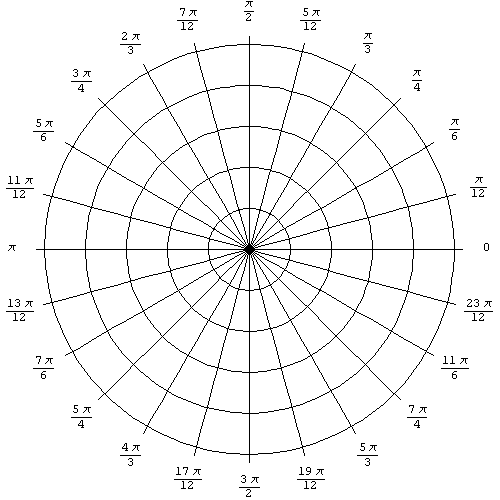
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**Identify and Graph Polar Equations by Converting to Rectangular Equations**

**Examples**

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