

March 17

How can you find the
x- and y- coordinates of a
point on the unit circle?

$$x = \cos \theta$$

$$y = \sin \theta$$

March 17

Students will verbally explain how to
graph polar functions and find
their derivatives

(using the words:
radius, angle, polar...)

Polar functions

$$r = \text{_____}$$

(in terms of θ)

r = radius
(distance from the origin)

θ = angle
(from standard position)
• starts on positive x-axis + moves counter-clockwise

Convert from polar coordinates to rectangular coordinates

$$x = r \cdot \cos \theta$$

$$y = r \cdot \sin \theta$$

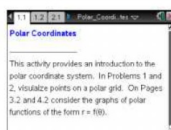


Polar Coordinates Student Activity

Name _____
Class _____

Open the TI-Nspire document *Polar_Coordinates.tns*.

In this activity, you will be introduced to the polar coordinate system. You will plot points given in polar form, convert polar coordinates to the rectangular coordinate system, and sketch the graphs of polar equations.



The polar coordinate system is a two-dimensional coordinate system defined by a point, called the pole, and a ray from the pole, called the polar axis. In a rectangular coordinate system, the pole is usually placed at the origin, and the polar axis is represented by the positive x-axis. A point in the polar coordinate system is represented by the ordered pair (r, θ) where r is the distance from the pole and θ is the angle (in radians) measured counterclockwise from the polar axis.

Move to page 1.2.

Press **ctrl** and **left** to navigate through the lesson.

- On this page, the left work area contains a slider for r and a clicker for θ . The point (r, θ) is plotted in the right panel along with a position vector. Change the values of r and θ as needed to answer the following questions.
 - Complete the following tables by finding the quadrant in which the point (r, θ) lies.

r	1.7	1.3	-0.6	-4.2	-3.2	3.1	-1.5	-2.5
θ	$\frac{5\pi}{6}$	$-\frac{3\pi}{4}$	$-\frac{7\pi}{6}$	$\frac{3\pi}{4}$	$-\frac{4\pi}{3}$	$-\frac{13\pi}{4}$	$\frac{13\pi}{12}$	$-\frac{7\pi}{4}$
Quadrant								

r	0.8	2.1	2	-2.7	4	3.5	-1.4	-3
θ	$\frac{19\pi}{6}$	$\frac{\pi}{4}$	$-\frac{17\pi}{12}$	$\frac{11\pi}{4}$	$\frac{7\pi}{6}$	$-\frac{\pi}{3}$	$\frac{11\pi}{3}$	$\frac{\pi}{3}$
Quadrant								

r	-4	2.7	1	3.9	-5	-2	-1	1.5
θ	$-\frac{\pi}{6}$	$-\frac{11\pi}{3}$	$\frac{23\pi}{12}$	$-\frac{11\pi}{6}$	$-\frac{9\pi}{4}$	$\frac{11\pi}{6}$	$-\frac{7\pi}{6}$	$\frac{9\pi}{4}$
Quadrant								