Math 1060 ~ Trigonometry

17 Polar Coordinates and Equations

Learning Objectives

In this section you will:

- Graph points in polar coordinates.
- Convert points in polar coordinates to rectangular coordinates and vice versa.
- Convert between rectangular and polar equations.

Rectangular Coordinates

\((x,y)\)

Polar Coordinates

\((r,\theta)\)
In fact:

\((r, \theta)\) has infinitely many representations:

\((r, \theta + 2n\pi)\) and \((-r, \theta + (2n+1)\pi)\), where \(n\) is any integer

How do we translate between Cartesian and polar coordinates?

Polar to Cartesian:

Ex1: Convert \((-4, \frac{2\pi}{3})\) to Cartesian coordinates.
How do we translate between Cartesian and polar coordinates?

Cartesian to polar:

Ex 2: Convert (-2, 2) to polar coordinates.

We can convert equations, too!

Ex 3:
(a) Convert \( x^2 - 3x = 1 + xy \) into polar coordinates.

(b) Convert \( r = -2\cos \theta \) into Cartesian coordinates.