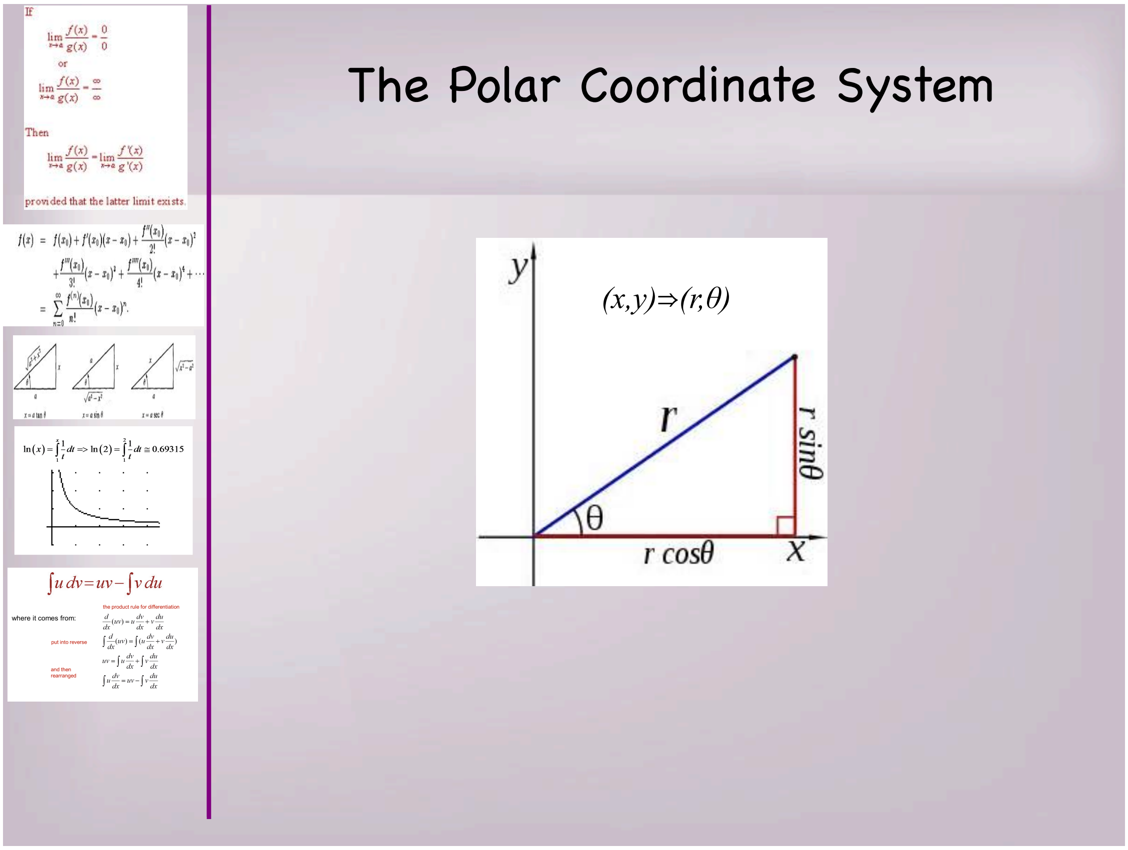
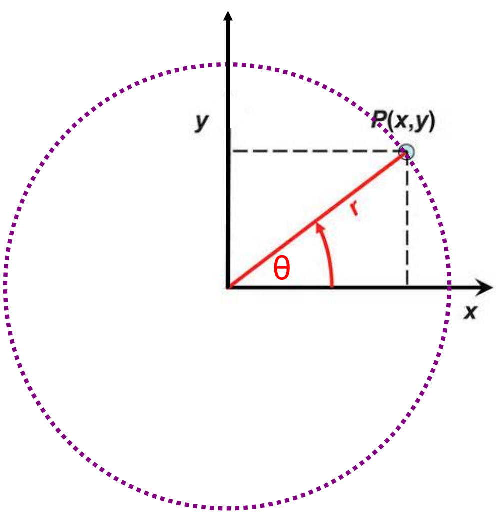


The Polar Coordinate System

is a different way to express points in a plane.

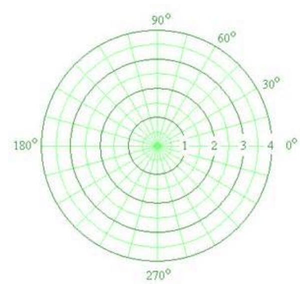


EX 1 Find the rectangular coordinates for this point. *(4, π/6)*

EX 2 Find the polar coordinates for this point. *(-2, 2)*

There are an infinite number of ways to write the same point in polar coordinates.

The point *(2,π/4)* has other names.



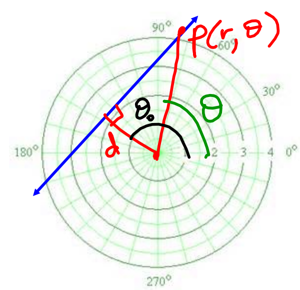
EX 3 Find three other ways to represent the polar coordinates for this point. *(-3, 2π/3)*

EX 4 Plot $r = 6 \sin \theta$.

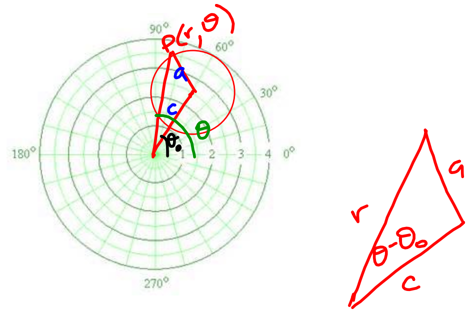
Prove that it is a circle in the Cartesian Coordinate system.

Polar Equations

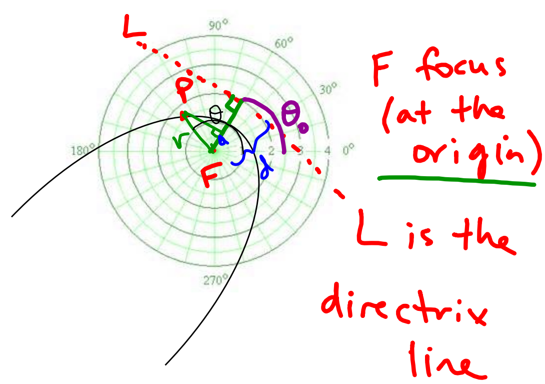
1) Lines



2) Circles



3) Conics (Parabolas, Hyperbolas, Ellipses)



EX 5 Name the curve. If it is a conic, give its eccentricity and sketch it.

a) $r = \dfrac{2}{2+2\cos(\theta-\pi/3)}$

b) $r = -4\cos(\theta-\pi/4)$

c) $\theta = 2\pi/3$