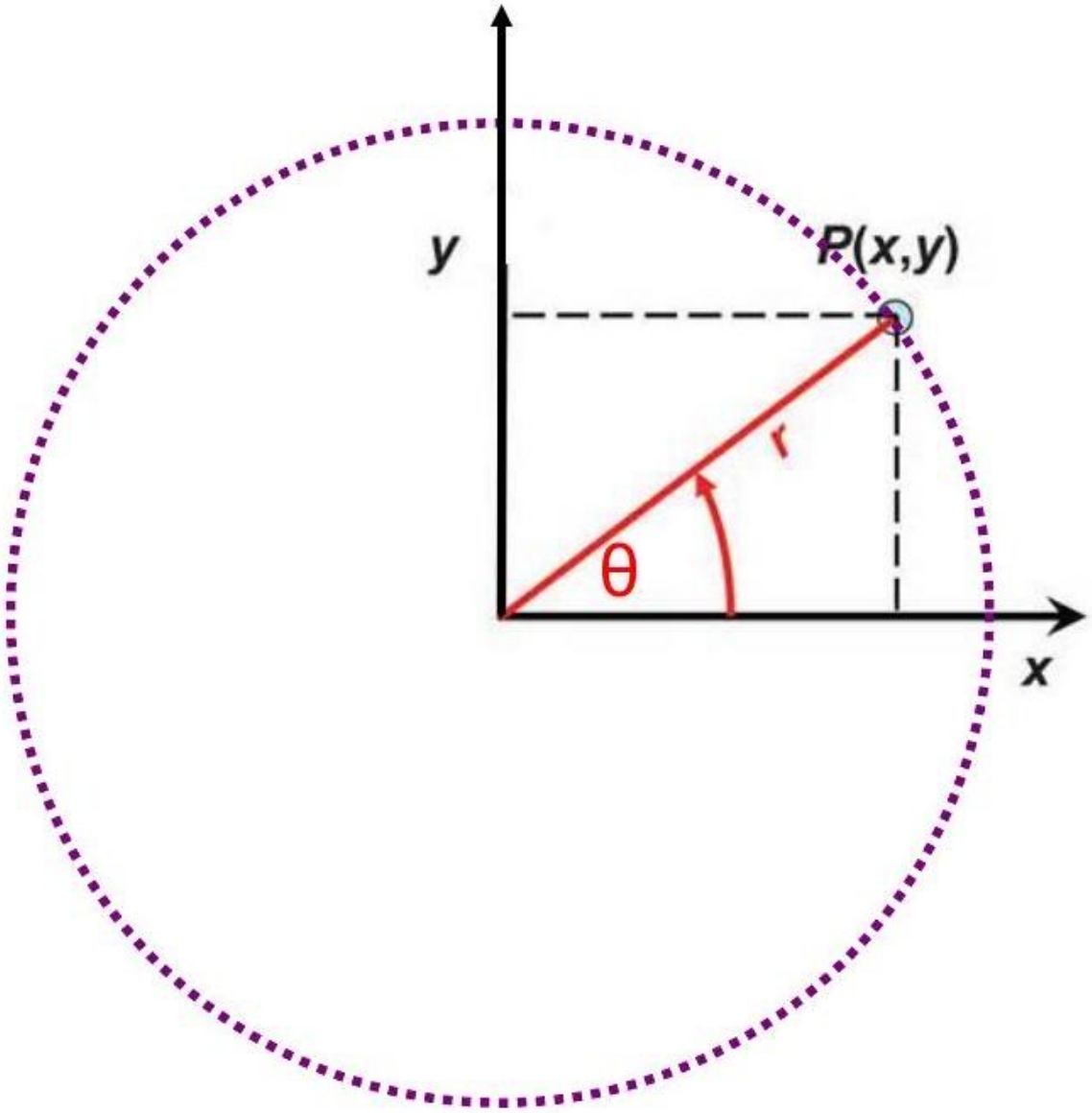
Math 1220 #27
The Polar Coordinate System

The Polar Coordinate System is a different way to express points in a plane.



EX 1

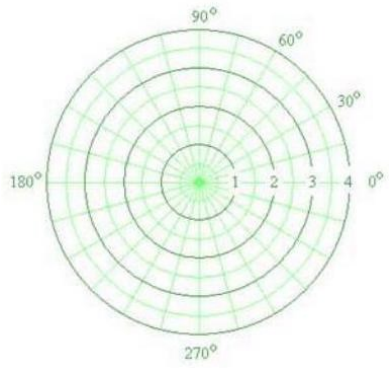
Find the rectangular coordinates for this point. $(4, \pi/6)$

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 $(2, \pi/4)$ has other names.



EX 3

Find three other ways to represent the polar coordinates for this point. $(-3,2\pi/3)$

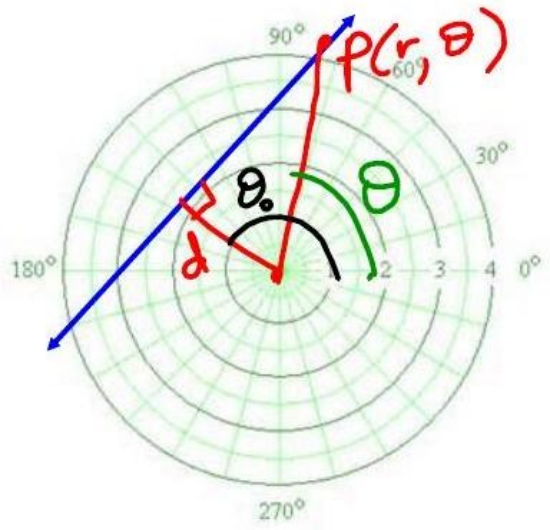
EX 4

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

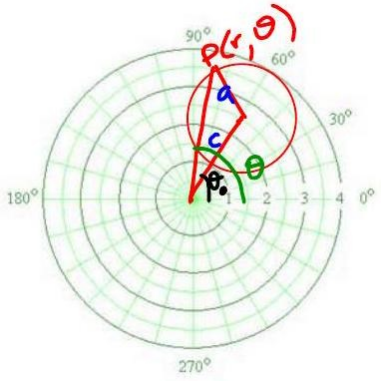
Prove that it is a circle in the Cartesian Coordinate system.

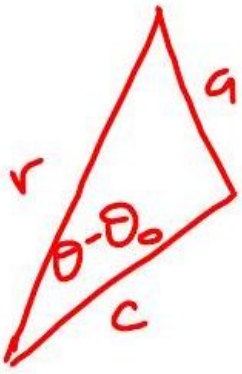
Polar Equations

1) Lines

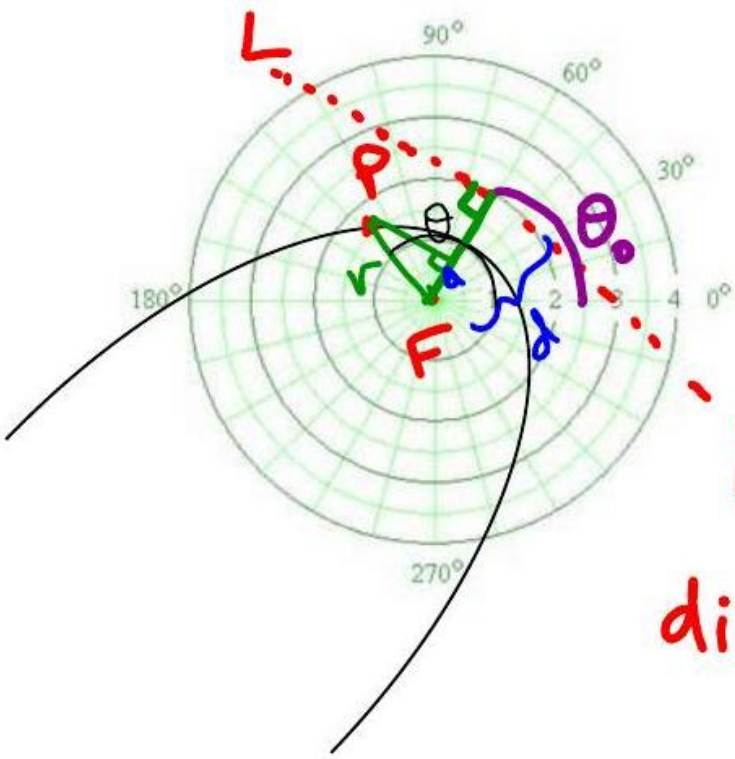


2) Circles





3) Conics (Parabolas, Hyperbolas, Ellipses)



F focus (at the origin)

L is the directrix line

EX 5

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

5a)

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

5b)

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

5c)

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