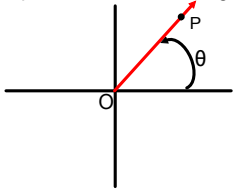


9.5 notes.notebook

Precalc notes 9.5

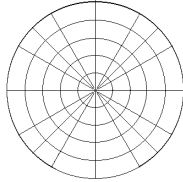
Polar Coordinates

The polar coordinate plane is an alternate way of graphing. Polar coordinates are in the order (r, θ) where r represents a directed distance from the origin (O) to a point (P) and θ represents a directed angle, counterclockwise from the axis to segment OP.

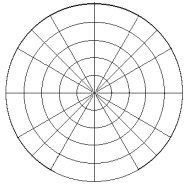


Plot the following points.

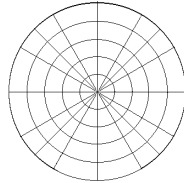
1) $\left(4, \frac{\pi}{4}\right)$



2) $\left(2, -\frac{3\pi}{2}\right)$



3) $\left(-3, \frac{11\pi}{6}\right)$



4) Represent the points from #1-3 in an alternate form.

Convert the rectangular equation to polar form.

11) $x^2 + y^2 = 25$

12) $y = 3x$

13) $(x^2 + y^2)^2 = 16(x^2 - y^2)$

$$\sin \theta = \frac{y}{r}, \quad \cos \theta = \frac{x}{r} \quad \text{so...} \quad x = r \cos \theta \quad \text{and} \quad y = r \sin \theta$$

Convert each polar coordinate into rectangular form.

5) $\left(2, \frac{\pi}{4}\right)$

6) $\left(-1, \frac{5\pi}{6}\right)$

7) $(2.5, 0.8)$

Convert each rectangular coordinate into polar form. $\tan \theta = \frac{y}{x}$ $r^2 = x^2 + y^2$

8) $(1, 0)$

9) $(-1, \sqrt{3})$

10) $(2, 2)$

Convert each polar equation into rectangular form.

14) $r = 7$

15) $\theta = \frac{4\pi}{3}$

16) $\theta = \frac{3\pi}{2}$

17) $r = 5 \csc \theta$

18) $r = \frac{5}{1 - \sin \theta}$