

# 10.7 day 2.notebook

## Warm up

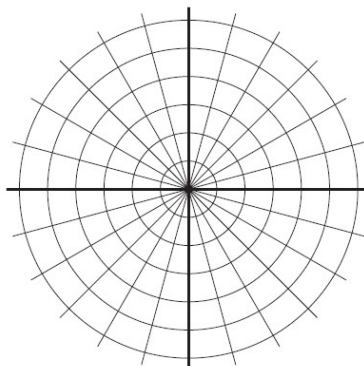
1. Name 3 other polar coordinates for the one given within the given parameters:

$$\left(2, \frac{3\pi}{4}\right)$$

a.  $r < 0, 0 \leq \theta < 2\pi$

b.  $r > 0, 2\pi \leq \theta < 4\pi$

c.  $r > 0, -2\pi \leq \theta < 0$



2. Convert the polar coordinate to a rectangular coordinate.

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

3. Convert the rectangular coordinate to a polar coordinate.

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

Apr 23-9:05 AM

**GO COUGARS!**

**p 783 Homework Questions**

In Exercises 1-8, plot the point given in polar coordinates and find two additional polar representations of the point, using  $-2\pi < \theta < 2\pi$ .

1.  $\left(4, -\frac{\pi}{3}\right)$   
 2.  $\left(0, -\frac{7\pi}{2}\right)$   
 3.  $\left(\sqrt{2}, 2.36\right)$   
 7.  $\left(2, \sqrt{2}, 4.71\right)$

In Exercises 9-16, a point in polar coordinates is given. Convert the point to rectangular coordinates.

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

10.  $(r, \theta) = \left(1, \frac{\pi}{2}\right)$

11.  $\left(-1, \frac{5\pi}{4}\right)$

13.  $\left(2, \frac{3\pi}{4}\right)$

15.  $(-2.5, 1.1)$

In Exercises 17-26, a point in rectangular coordinates is given. Convert the point to polar coordinates.

17.  $(1, 1)$   
 19.  $(-6, 0)$   
 21.  $(-3, 4)$   
 23.  $(-\sqrt{3}, -\sqrt{3})$   
 25.  $(6, 9)$

In Exercises 27-32, use a graphing utility to find one set of polar coordinates for the point given in rectangular coordinates.

28.  $(\sqrt{3}, 2)$   
 29.  $(3, 3)$

*Handwritten work for Exercise 29:*

$r = \sqrt{9+4} = \sqrt{13}$   
 $\tan \theta = \frac{3}{3} = 1$   
 $\theta = \frac{\pi}{4}$   
 $(\sqrt{13}, 5.69)$

*Handwritten work for Exercise 28:*

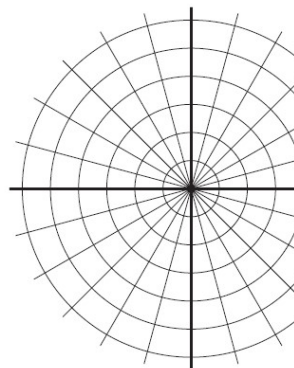
$r = \sqrt{3+4} = \sqrt{7}$   
 $\tan \theta = \frac{2}{\sqrt{3}}$   
 $\theta = \tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$

Feb 2-9:51 PM

# 10.7 Day 2

## Converting Polar Equations to Rectangular Equations

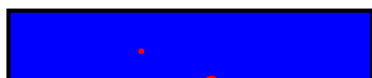
## Converting Rectangular Equations to Polar Equations



Apr 23-9:20 AM

### Converting Polar equations to Rectangular Equations

1.  $r = -2$



$$r^2 = (-2)^2$$

$$x^2 + y^2 = 4$$

$$x^2 + y^2 = r^2$$

$$x = r \cos \theta$$

$$y = r \sin \theta$$

2.  $r = -2 \sin \theta$



$$r \cdot r = -2r \sin \theta$$

$$x^2 + y^2 = -2y$$

$$x^2 + (y^2 + 2y + 1) = 0 + 1$$

$$x^2 + (y + 1)^2 = 1$$

Apr 19-9:56 AM

## 10.7 day 2.notebook

3.  $r = -3\cos\theta - 2\sin\theta$

$$r \cdot r = -3r\cos\theta - 2r\sin\theta$$

$$x^2 + y^2 = -3x - 2y$$

$$(x^2 + 3x + \frac{9}{4}) + (y^2 + 2y + 1) = \frac{9}{4} + 1$$

$$(x + \frac{3}{2})^2 + (y + 1)^2 = \frac{13}{4}$$

4.  $r = 3\sec\theta$

$$r = \frac{3}{\cos\theta}$$

$$r\cos\theta = 3$$

$$x = 3$$

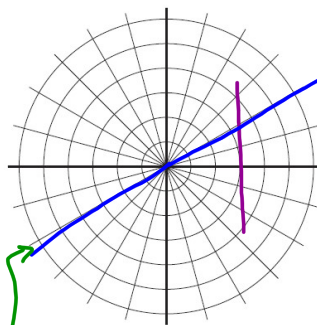
5.  $\theta = \frac{\pi}{6}$

$$\tan\theta = \tan\frac{\pi}{6}$$

$$\frac{r\sin\theta}{r\cos\theta} = \frac{1}{\sqrt{3}}$$

$$\frac{y}{x} = \frac{1}{\sqrt{3}}$$

$$y = \frac{1}{\sqrt{3}}x$$



Apr 19-9:59 AM

## Rectangular Equations to Polar Equations

6.  $x = 2$

$$r\cos\theta = 2$$

$$r = \frac{2}{\cos\theta}$$

$$r = 2\sec\theta$$

7.  $2x - 3y = 5$

$$2r\cos\theta - 3r\sin\theta = 5$$

$$r(2\cos\theta - 3\sin\theta) = 5$$

$$r = \frac{5}{2\cos\theta - 3\sin\theta}$$

Apr 19-10:00 AM

10.7 day 2.notebook

$$8. (x-3)^2 + y^2 = 9$$

$$\underline{x^2} - 6x + \underline{9} + y^2 = 9$$

$$x^2 + y^2 - 6x = 0$$

$$\frac{r^2}{r} = \frac{6r \cos \theta}{r}$$

$$r = 6 \cos \theta$$

Apr 19-10:01 AM

## HOMework



p 783 33-63 odd

Feb 2-9:51 PM