Today's Plan:

Learning Target (standard): I will review polar coordinates & graphing polar equations.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

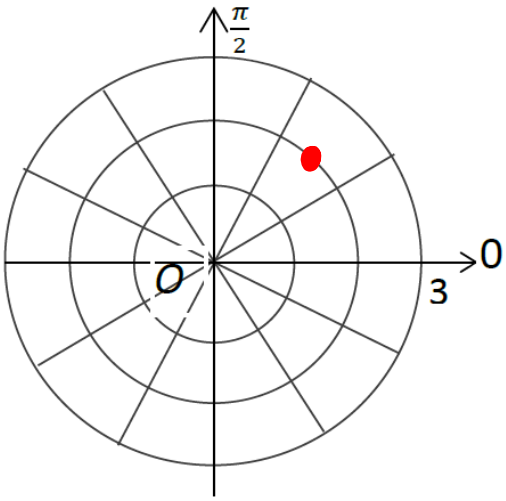
Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of review concepts and assign students assessment problems over review concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over review concepts, practice review concepts with the aid of other students and the teacher and complete homework assignment.

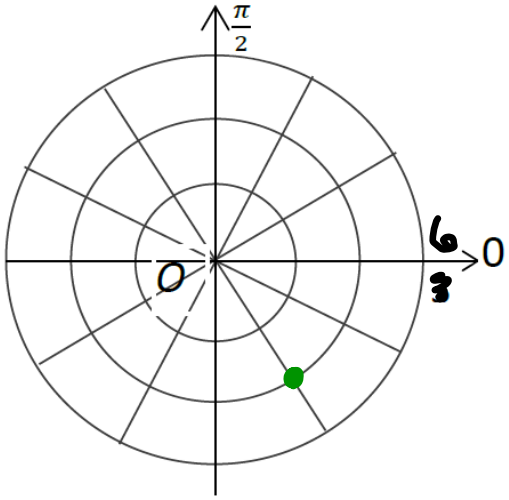
Plot the point with the given polar coordinates.

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



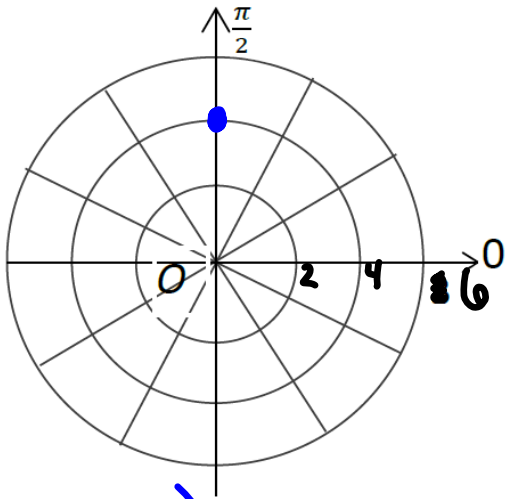
Plot the point with the given polar coordinates.

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



Find 3 pairs of polar coordinates that describe the same point as the provided polar coordinates.

$$(4, 90°)$$



$(-4, 270°)$

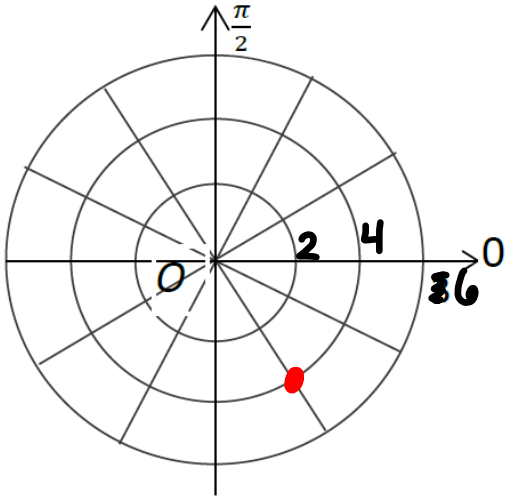
$(4, -270°)$

$(4, 450°)$

$(-4, -90°)$

Find 3 pairs of polar coordinates that describe the same point as the provided polar coordinates.

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



$\left(4, \frac{5\pi}{3}\right)$

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

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

Convert each polar coordinates to rectangular coordinates.

$$(-4, -90°)$$

$x = r\cos\theta$

$x = -4\cos(-90°)$

$x = -4(0)$

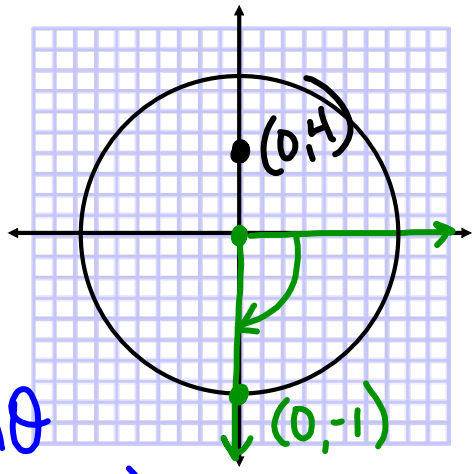
$x = 0$

$y = r\sin\theta$

$y = -4\sin(-90°)$

$y = -4(-1)$

$y = 4$



$x = 0$

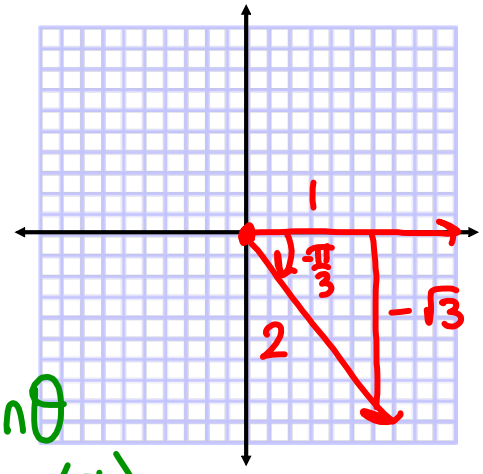
$y = -1$

$r = 1$

$(0, 4)$

Convert each pair polar coordinates to rectangular coordinates.

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



$x = r\cos\theta$

$x = -3\cos\left(-\frac{\pi}{3}\right)$

$x = -3\left(\frac{1}{2}\right)$

$x = -\frac{3}{2}$

$y = r\sin\theta$

$y = -3\sin\left(-\frac{\pi}{3}\right)$

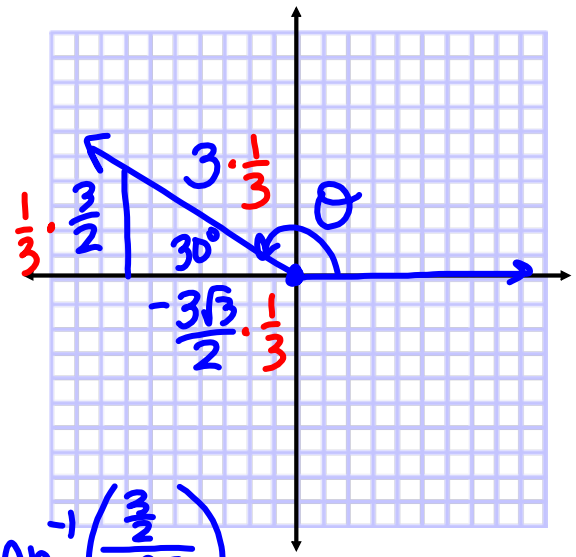
$y = -3\left(-\frac{\sqrt{3}}{2}\right)$

$y = \frac{3\sqrt{3}}{2}$

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

Convert each pair rectangular coordinates to polar coordinates.

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



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

$r^2 = \left(-\frac{3\sqrt{3}}{2}\right)^2 + \left(\frac{3}{2}\right)^2$

$= \frac{27}{4} + \frac{9}{4}$

$r^2 = 9$

$r = 3$

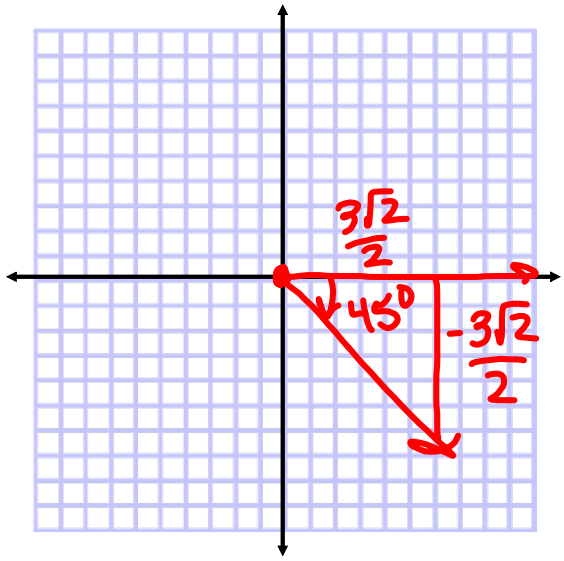
$\theta = \tan^{-1}\left(\frac{\frac{3}{2}}{-\frac{3\sqrt{3}}{2}}\right)$

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

$\left(3, \frac{5\pi}{6}\right)$

Convert each pair rectangular coordinates to polar coordinates.

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



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

$r^2 = \left(\frac{3\sqrt{2}}{2}\right)^2 + \left(-\frac{3\sqrt{2}}{2}\right)^2$

$= \frac{18}{4} + \frac{18}{4}$

$r^2 = 9$

$r = 3$

$\theta = 315^\circ = \frac{7\pi}{4}$

$\left(3, \frac{7\pi}{4}\right)$

Convert the equation from rectangular to polar form.

$$(x+2)^2 + (y+1)^2 = 5$$

$x^2 + 4x + 4 + y^2 + 2y + 1 = 5$

$x^2 + y^2 + 4x + 2y = 0$

$r^2 + 4r\cos\theta + 2r\sin\theta = 0$

$r^2 = -4r\cos\theta - 2r\sin\theta$

$r = -4\cos\theta - 2\sin\theta$

Convert the equation from rectangular to polar form.

$$(x-1)^2+(y+3)^2=10$$

$x^2-2x+1+y^2+6y+9=10$

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

$r^2-2r\cos\theta+6r\sin\theta=0$

$r^2=2r\cos\theta-6r\sin\theta$

$r=2\cos\theta-6\sin\theta$

Convert the equation from polar to rectangular form.

$$r=-6\sin\theta$$

$r^2=-6r\sin\theta$

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

$x^2+y^2+6y+9=+9$

$x^2+(y+3)^2=9$

Circle $C:(0,-3)$ $r=3$

Convert the equation from polar to rectangular form.

$$r = 2\cot\theta\csc\theta$$

$r = 2\left(\frac{\cos\theta}{\sin\theta}\right)\left(\frac{1}{\sin\theta}\right)$

$r = 2\left(\frac{\cos\theta}{\sin^2\theta}\right)$

$r\sin^2\theta = 2\cos\theta$

$r^2\sin^2\theta = 2r\cos\theta$

$(r\sin\theta)^2 = 2r\cos\theta$

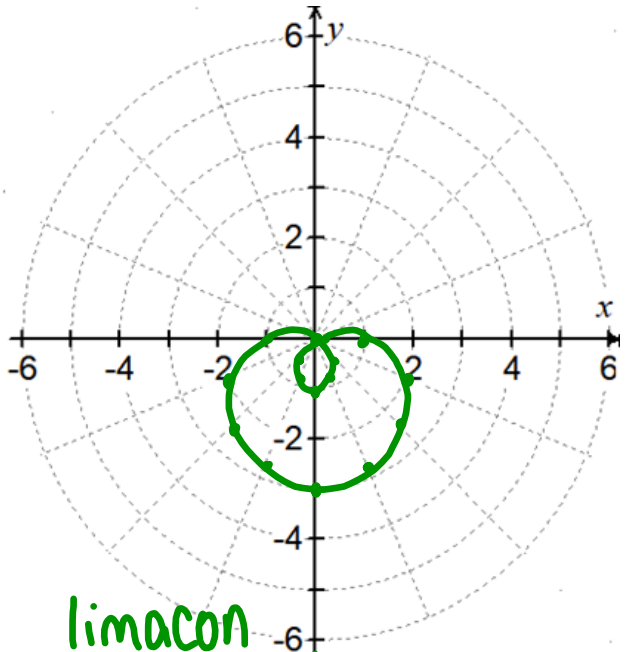
$y^2 = 2x$

or $x = \frac{1}{2}y^2$

Graph the polar equation.

$$r = 1 - 2\sin\theta$$

θ	r	θ	r
0	1	π	1
$\frac{\pi}{6}$	0	$\frac{7\pi}{6}$	2
$\frac{\pi}{4}$	-.414	$\frac{5\pi}{4}$	2.414
$\frac{\pi}{3}$	-.732	$\frac{4\pi}{3}$	2.732
$\frac{\pi}{2}$	-1	$\frac{3\pi}{2}$	3
$\frac{2\pi}{3}$	-.732	$\frac{5\pi}{3}$	2.732
$\frac{3\pi}{4}$	-.414	$\frac{7\pi}{4}$	2.414
$\frac{5\pi}{6}$	0	$\frac{11\pi}{6}$	2
π	1	2π	1



limacon w/inner loop

Assignment:

QUIZ Monday, May 15

Polar Coordinates Review

#1-14