

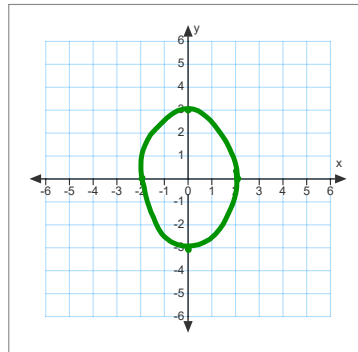
Warm up

1. Find the parametric equation and sketch for:

a. $x = 2 \cos t$ $y = 3 \sin t$

ellipse
m(0,0) $\frac{x^2}{4} + \frac{y^2}{9} = 1$

$\frac{x}{2} = \cos t$ $\frac{y}{3} = \sin t$
 $\frac{x^2}{4} = \cos^2 t$ $\frac{y^2}{9} = \sin^2 t$

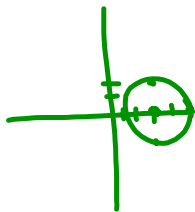


b. $x = 3 + 2 \cos t$ $y = -2 \sin t$

Circle

$\frac{x-3}{2} = \cos t$ $\frac{(x-3)^2}{4} = \cos^2 t$
 $\frac{y}{-2} = \sin t$ $\frac{y^2}{4} = \sin^2 t$
 $\frac{(x-3)^2}{4} + \frac{y^2}{4} = 1$

$(x-3)^2 + y^2 = 4$



Apr 23-9:03 AM

GO COUGARS!

Homework Questions

p 705

21. $x = 2 \cos \theta, y = 3 \sin \theta$ 22. $x = \cos \theta, y = 4 \sin \theta$
23. $x = e^{-t}, y = e^{2t}$ 24. $x = e^{2t}, y = e^t$
25. $x = t^3, y = 3 \ln t$ 26. $x = \ln 2t, y = 2t^2$

In Exercises 27-32, use a graphing utility to graph the curve represented by the parametric equations.

27. $x = 4 + 3 \cos \theta$ 28. $x = 4 + 3 \cos \theta$
 $y = -2 + \sin \theta$ $y = -2 + 2 \sin \theta$
29. $x = 4 \sec \theta$ 30. $x = \sec \theta$
 $y = \tan \theta$ $y = \tan \theta$

Sketch the curve represented by the parametric equations. Eliminate the parameter and write the corresponding rectangular equation. State the domain and range of the curve.

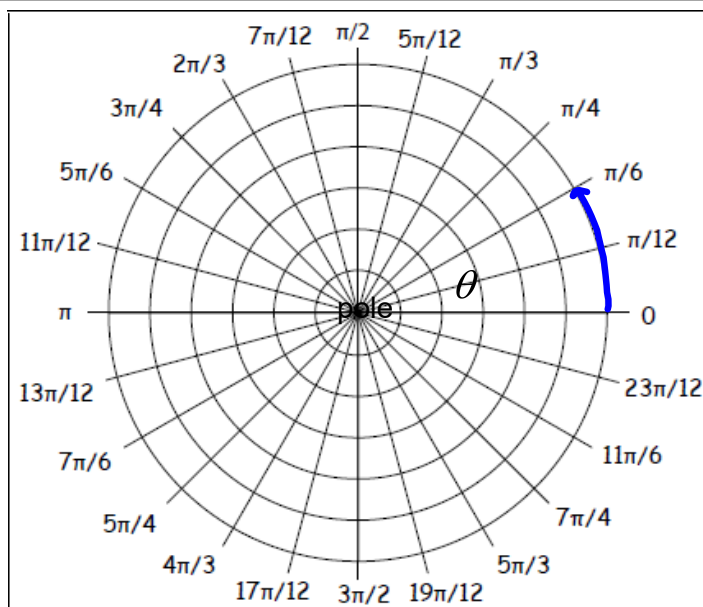
1. $x = 1 + t$ $y = t$ 11. $x = \sqrt{t}$ $y = \sqrt{t}$
2. $x = 2t - 3$ $y = 9 - 4t$ 12. $x = \sqrt{t}$ $y = 1 - t$
3. $x = 4 \sin t$ $y = 4 \cos t$ 13. $x = \sqrt{t}$ $y = 1 - t$
4. $x = t + 2$ $y = \frac{2}{t}$ 14. $x = t + 1$ $y = t^2$
5. $x = 4t - 2$ $y = 8t^2$ 15. $x = t + 1$ $y = t^3$
6. $x = t - 3$ $y = \sqrt{t - 2}$ 16. $x = \sqrt{1 - t}$ $y = \sqrt{t}$
7. $x = 4 \cos t$ $y = 8 \sin t$ 17. $x = \sqrt{1 - t^2}$ $y = t$
8. $x = 5 - 3t$ $y = 2 + t$ 18. $x = \cos t$ $y = 3 \sin t$
9. $x = 3t - 1$ $y = t^2 + 2$ 19. $x = -\sqrt{1 - t}$ $y = -\sqrt{t}$
10. $x = |t|$ $y = t$ 20. $x = 2 + \sin t$ $y = 3 + \cos t$
21. $x = e^t$ $y = e^{2t}$

Handwritten notes:
- $\sec^2 \theta = \tan^2 \theta + 1$
- $\frac{x^2}{16} = \sec^2 \theta$
- $\frac{x}{4} = \sec \theta$ $-\frac{y}{4} = \tan \theta$
- $\frac{y}{2} = \tan \theta$ $\frac{x^2}{16} - \frac{y^2}{4} = 1$
- $x^2 = t$
- $y = 1 - x^2$
- $y = -x^2 + 1$
- $\frac{t}{x} = \frac{y}{x}$ table with values: $\frac{-3}{-1}, \frac{-2}{-1}, \frac{-1}{-2}, \frac{0}{-2}, \frac{1}{-2}, \frac{2}{-2}, \frac{3}{-2}$

Feb 2-9:51 PM

9.6 Polar Coordinates

Apr 19-9:28 AM



$$P = (r, \theta)$$

polar axis

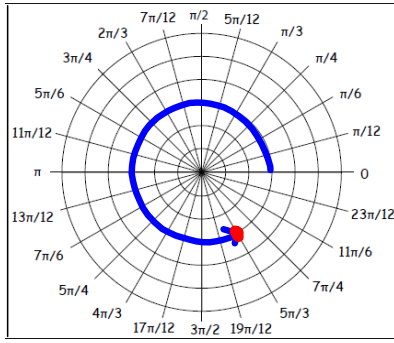
r - the distance
(or # of rings) from
the pole

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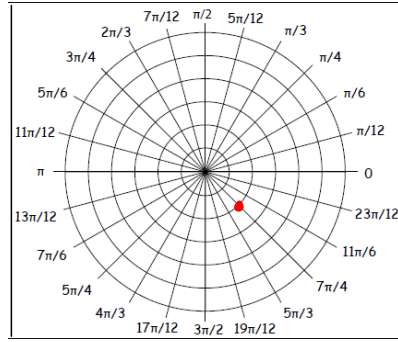
Plot the points

(r, θ)

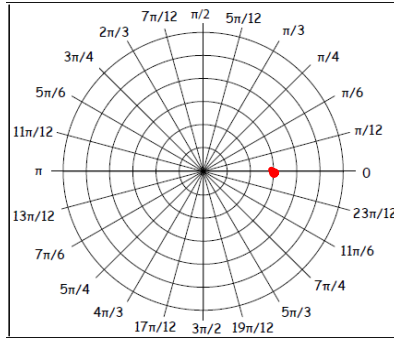
$(3, \frac{5\pi}{3})$



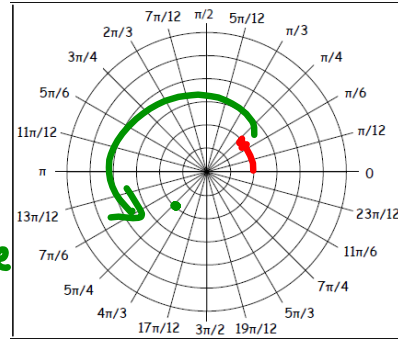
$(2, -\frac{\pi}{4})$



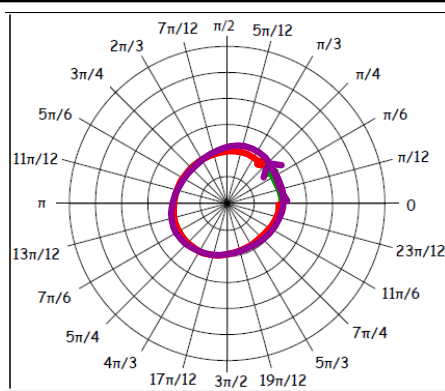
$(3, 0)$



$(-2, \frac{\pi}{4})$
 Flip to opposite quadrant
 using the same RA



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other names for point P

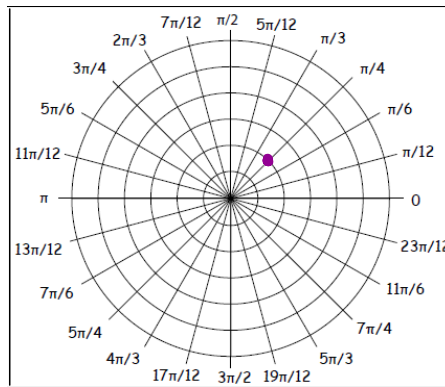
$P = (2, \frac{\pi}{4})$

* $-2\pi < \theta < 0$

* $2\pi < \theta < 4\pi$

$(2, \frac{\pi}{4} - 2\pi) = (2, -\frac{7\pi}{4})$

$(2, \frac{\pi}{4} + 2\pi) = (2, \frac{9\pi}{4})$



$P = (-2, \frac{5\pi}{4})$

$r > 0 \quad (2, \frac{\pi}{4})$

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Find other polar coordinates for $\left(3, \frac{\pi}{6}\right)$ when:

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

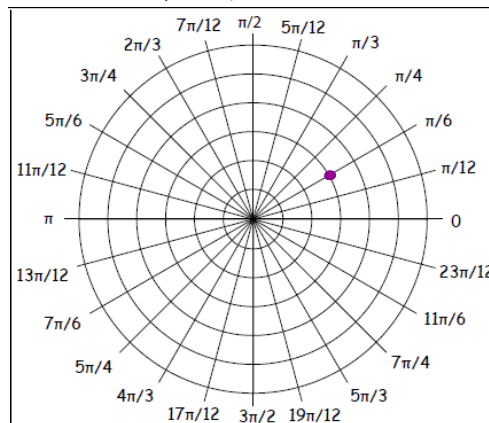
\downarrow \downarrow $+\text{COTA}$
 $\left(3, \frac{\pi}{6} + 2\pi\right) \rightarrow \left(3, \frac{13\pi}{6}\right)$

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

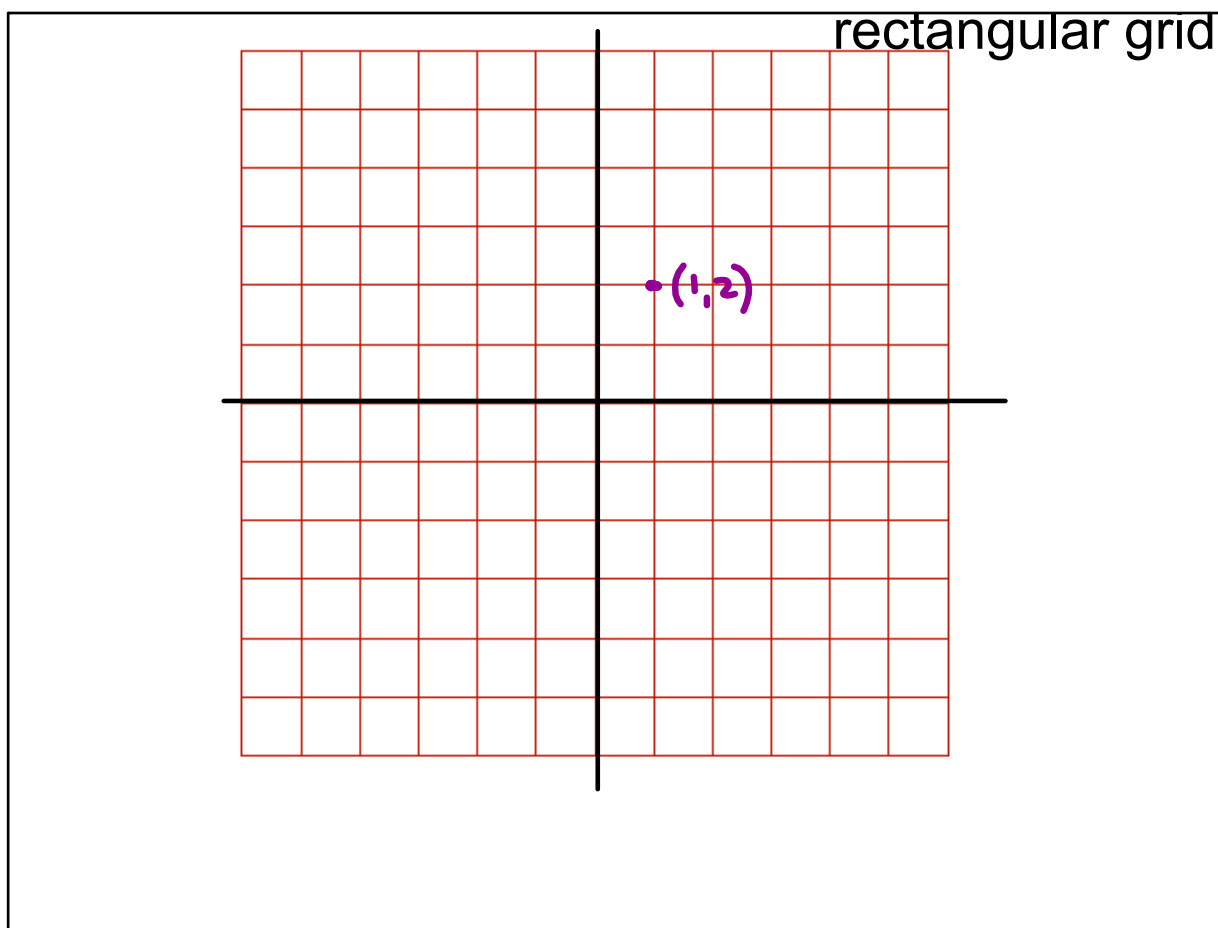
\downarrow
 $\left(-3, \frac{\pi}{6} + \pi\right) \rightarrow \left(-3, \frac{7\pi}{6}\right)$

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

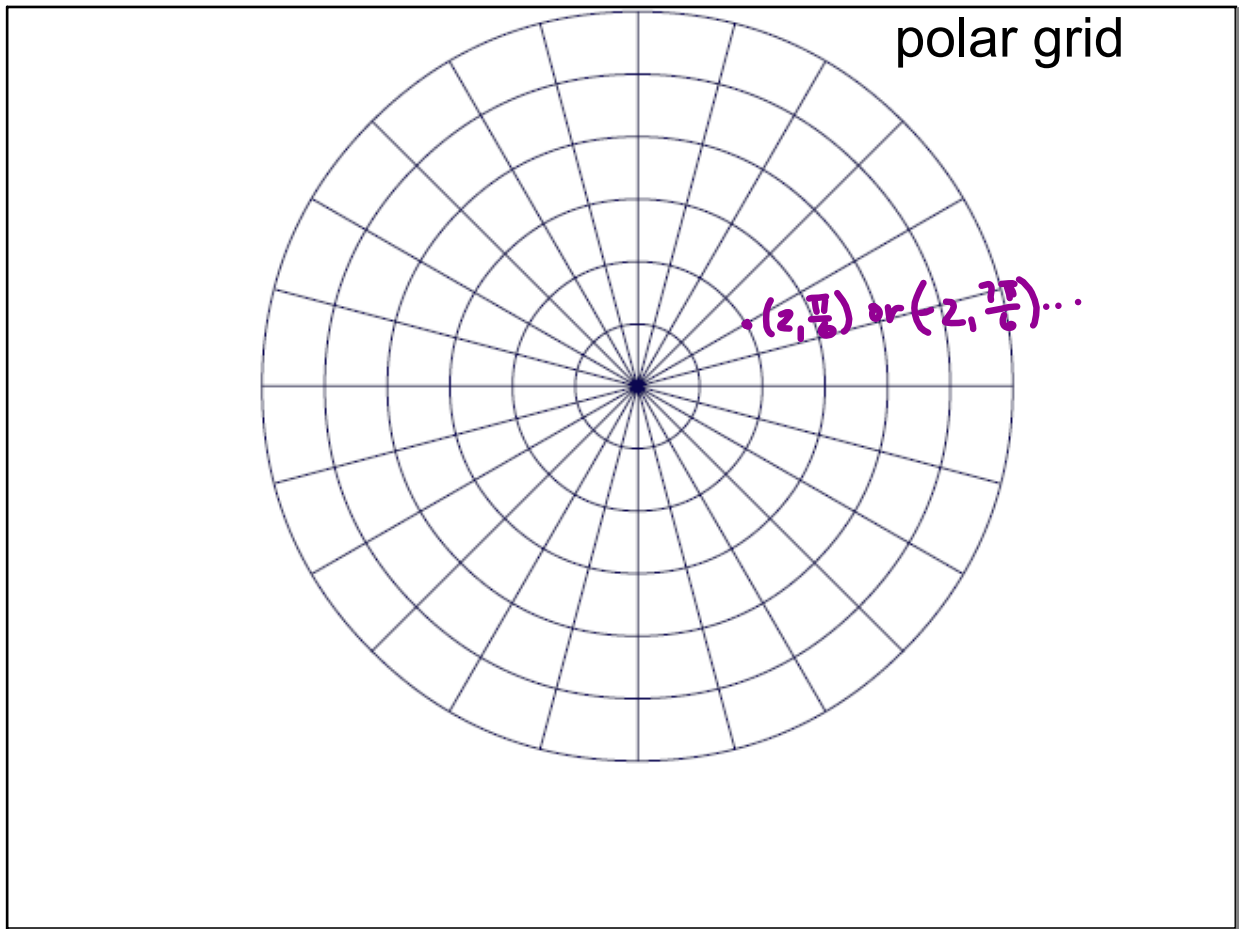
\downarrow $-\text{COTA}$
 $\left(3, \frac{\pi}{6} - 2\pi\right) \rightarrow \left(3, \frac{11\pi}{6}\right)$



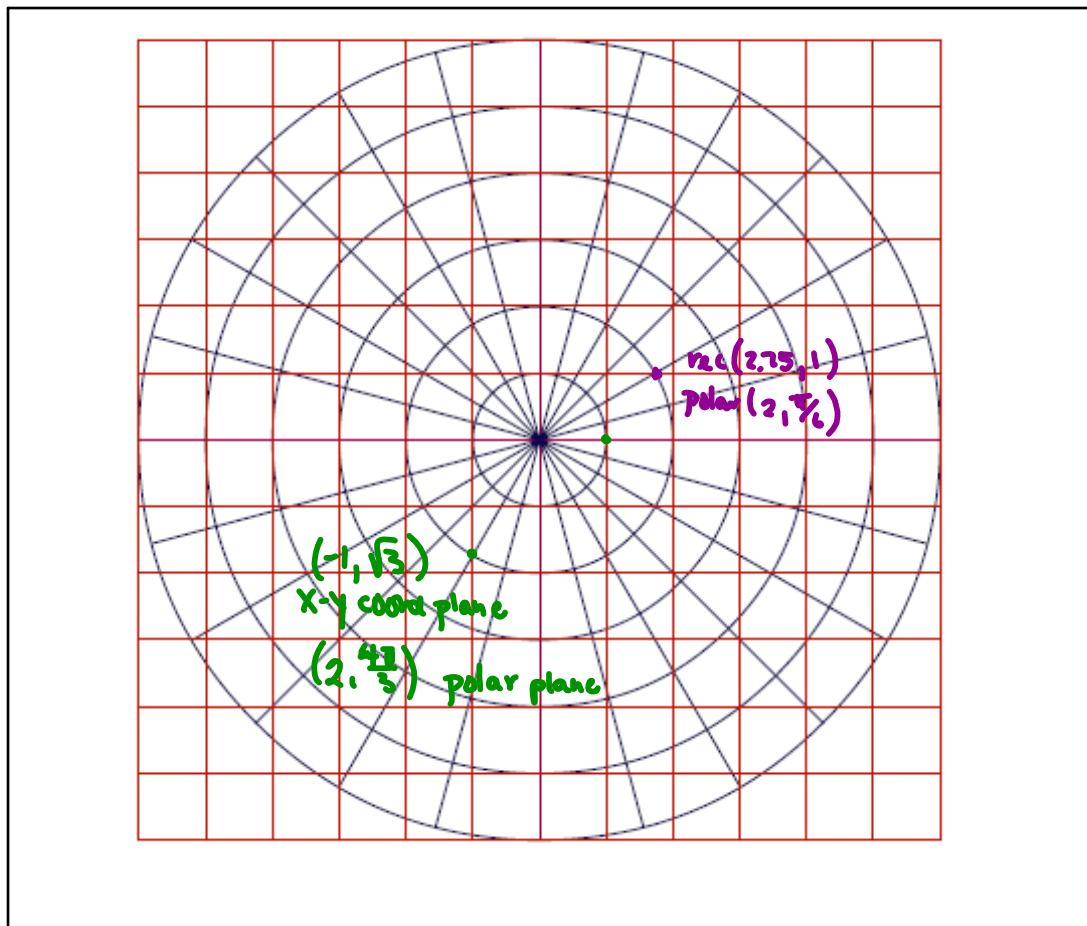
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May 14-7:45 AM



May 14-7:45 AM

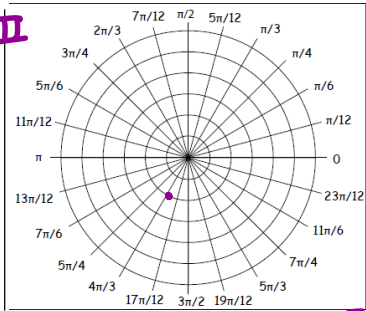


May 14-7:45 AM

Convert from Rectangular points in terms of (x, y) to Polar points in terms of (r, θ):

remember that: $r = \sqrt{x^2 + y^2}$ $\tan \theta = \frac{y}{x}$

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



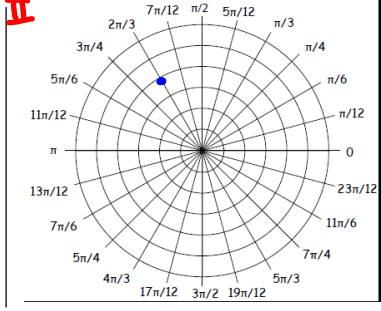
Q III

$r = \sqrt{(-1)^2 + (-\sqrt{3})^2}$
 $= \sqrt{1+3} = 2$

$\tan \theta = \frac{\sqrt{3}}{1} = \sqrt{3}$
 $\text{RA}\theta = \frac{\pi}{3}$
 $\theta = \frac{4\pi}{3}$

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

$(-2, 2\sqrt{3})$



Q II

$r = \sqrt{2^2 + (2\sqrt{3})^2}$
 $= \sqrt{4+12}$
 $= 4$

$\tan \theta = \frac{2\sqrt{3}}{2}$
 $\text{RA}\theta = \frac{\pi}{3}$
 $\theta = \frac{2\pi}{3}$

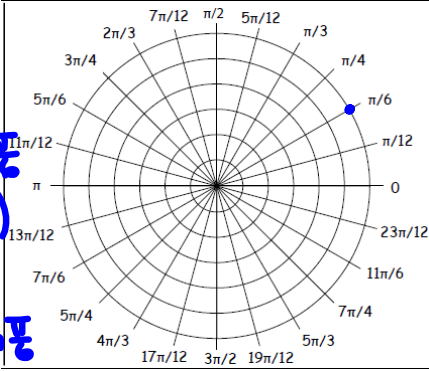
$(4, \frac{2\pi}{3})$

Apr 19-9:47 AM

Convert from polar to rectangular form:

$x = r \cos \theta$ $y = r \sin \theta$ (look familiar?)

$(6, \frac{\pi}{6})$

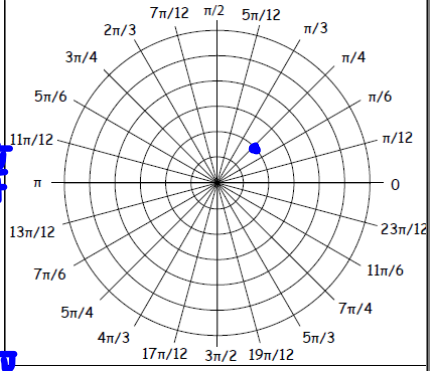


$x = 6 \cos \frac{\pi}{6}$
 $= 6(\frac{\sqrt{3}}{2})$
 $= 3\sqrt{3}$

$y = 6 \sin \frac{\pi}{6}$
 $= 6(\frac{1}{2})$
 $= 3$

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

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



$x = -2 \cos \frac{5\pi}{4}$
 $= -2(-\frac{1}{\sqrt{2}})$
 $= \frac{2}{\sqrt{2}} = \sqrt{2}$

$y = -2 \sin \frac{5\pi}{4}$
 $= -2(-\frac{1}{\sqrt{2}})$
 $= \frac{2}{\sqrt{2}} = \sqrt{2}$

$(\sqrt{2}, \sqrt{2})$
 or
 $(\frac{2}{\sqrt{2}}, \frac{2}{\sqrt{2}})$

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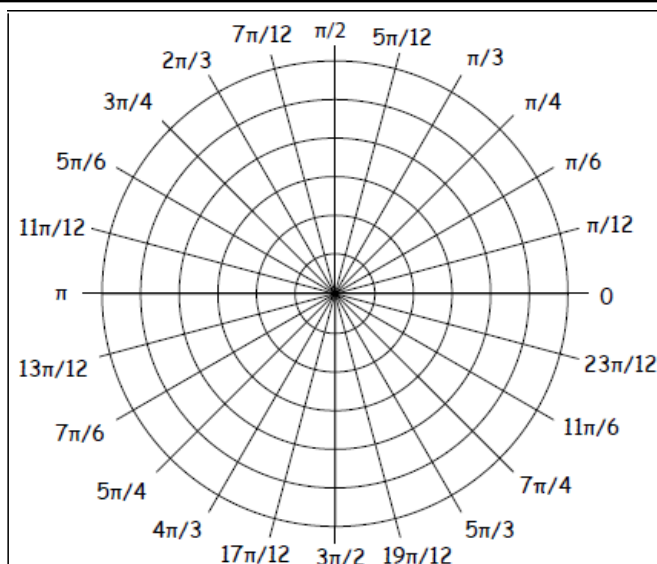
HOMEWORK



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google classroom assignment

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Apr 19-9:29 AM