Quiz 5A - Math 130

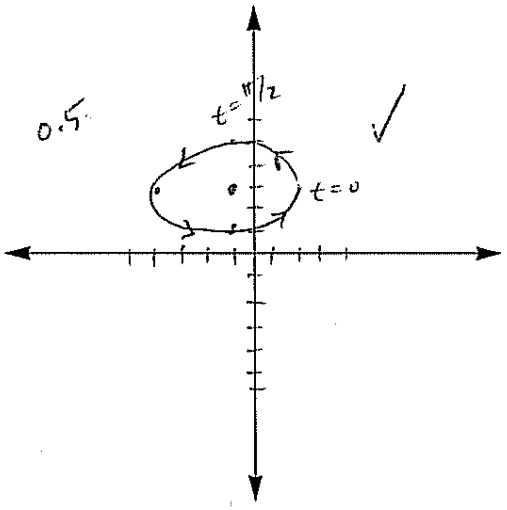
1:19

Name: Key

1. (3 points) Find the equation in x and y corresponding to the parametric equations

$$x = 3\cos t - 1 \quad \text{and} \quad y = 2\sin t + 3$$

Sketch the graph, indicating the orientation.



✓

$\frac{x+1}{3} = \cos t \qquad \frac{y-3}{2} = \sin t$

✓ 0.5

$\sin^2 t + \cos^2 t = 1$

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

is an ellipse.

$C = (-1, 3)$

t	x	y
0	2	3
$\frac{\pi}{2}$	-1	5

2. (2 points) Convert the polar coordinates $\left(6, \frac{2\pi}{3}\right)$ into rectangular coordinates.

$x = r\cos\theta$

$y = r\sin\theta$

$x = 6 \cdot \cos\frac{2\pi}{3} = 6 \cdot \left(\frac{-1}{2}\right) = -3$

$y = 6 \sin\frac{2\pi}{3} = 6 \cdot \frac{\sqrt{3}}{2} = 3\sqrt{3}$

$-3, 3\sqrt{3}$

3. (2 points) Change the rectangular equation $y^2 = 6x$ into polar form (Solve your answer for r).

$(r\sin\theta)^2 = 6r\cos\theta$

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

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

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

or $r = 6 \cdot \frac{1}{\sin\theta} \cdot \frac{\cos\theta}{\sin\theta}$

$$r = 6\csc\theta \cdot \cot\theta$$

4. (3 points) Graph the polar equation $r = 3 + \sin\theta$. Show your work.

r	θ
3	0
3.5	$\frac{\pi}{6}$
4	$\frac{\pi}{2}$
3.5	$\frac{5\pi}{6}$
3	π
2	$\frac{3\pi}{2}$