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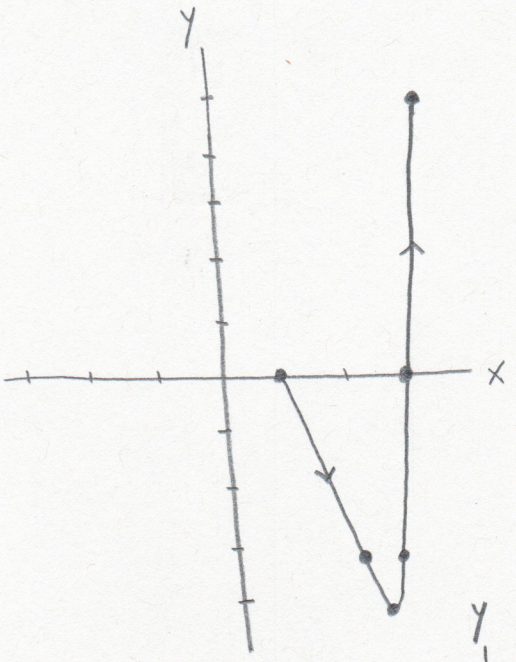
7/9/2012

MATH 202

§9.1

1

t	x	y
0	1	0
1	2	-3
2	2.4	-4
3	2.7	-3
4	3	0
5	3.2	5



$x = 1 + \sqrt{t}$

$y = t^2 - 4t$

$0 \le t \le 5$

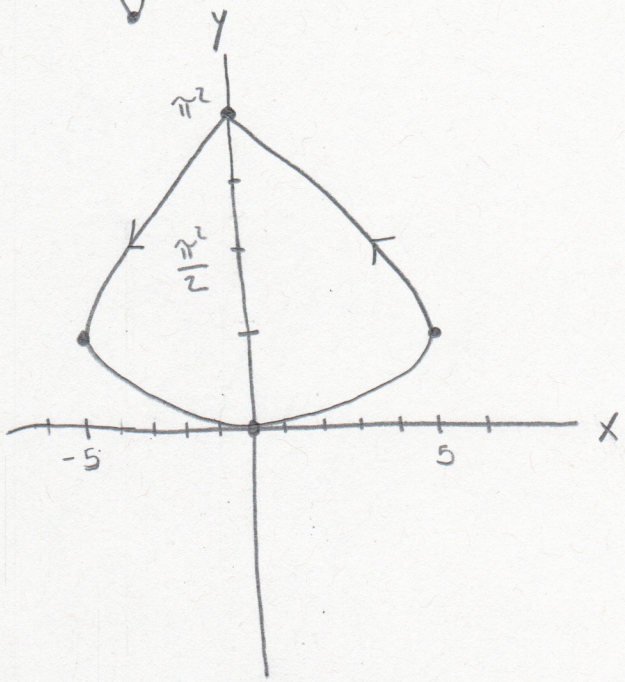
3

t	x	y
$-\pi$	0	π^2
$-\frac{\pi}{2}$	-5	$\frac{\pi^2}{4}$
0	0	0
$\frac{\pi}{2}$	5	$\frac{\pi^2}{4}$
π	0	π^2

$x = 5 \sin t$

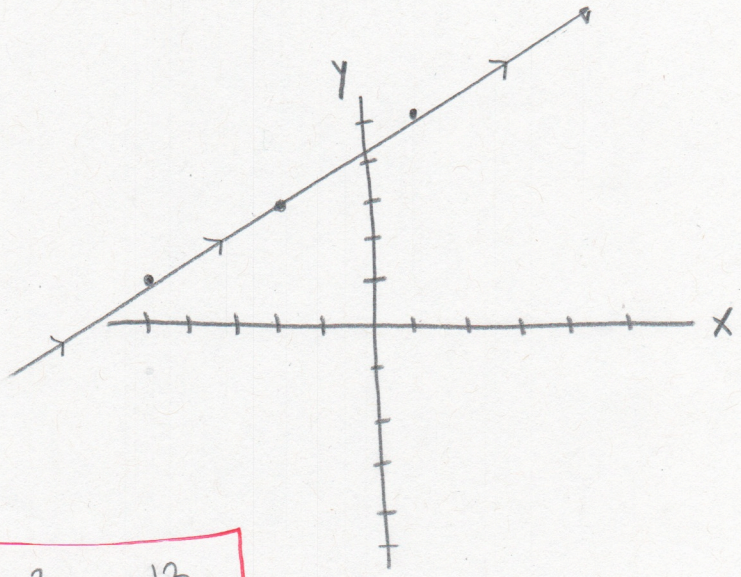
$y = t^2$

$-\pi \le t \le \pi$



5

t	$x = 3t - 5$	$y = 2t + 1$
0	-5	1
1	-2	3
2	1	5

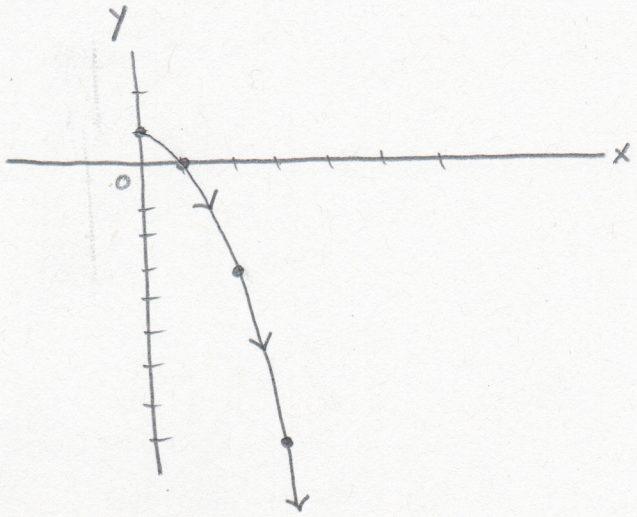


$y = 2t + 1 \Rightarrow t = \frac{1}{2}(y - 1)$

$x = 3\left(\frac{1}{2}(y-1)\right) - 5 \Rightarrow$ $\boxed{2x = 3y - 13}$

7

t	$x = \sqrt{t}$	$y = 1 - t$
0	0	1
1	1	0
4	2	-3
9	3	-8



$y = 1 - t \Rightarrow t = 1 - y$

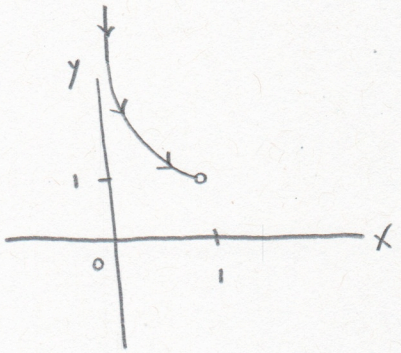
$\therefore \boxed{x = \sqrt{1 - y}}$

11 $x = \sin t$, $y = \csc t = \dfrac{1}{\sin t}$ $\quad 0 < t < \dfrac{\pi}{2}$

$\therefore \boxed{y = \dfrac{1}{x}}$ $\quad 0 < t < \dfrac{\pi}{2} \Rightarrow 0 < \sin t < 1$

$\parallel$

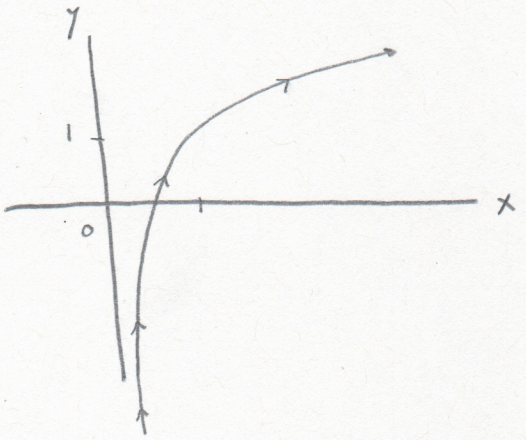
x



13 $x = e^{2t}$, $y = t + 1 \Rightarrow t = y - 1$

$\therefore \; x = e^{2(y-1)}$

$\ln(x) = 2(y-1) \Rightarrow \boxed{y = \frac{1}{2}\ln(x) + 1}$



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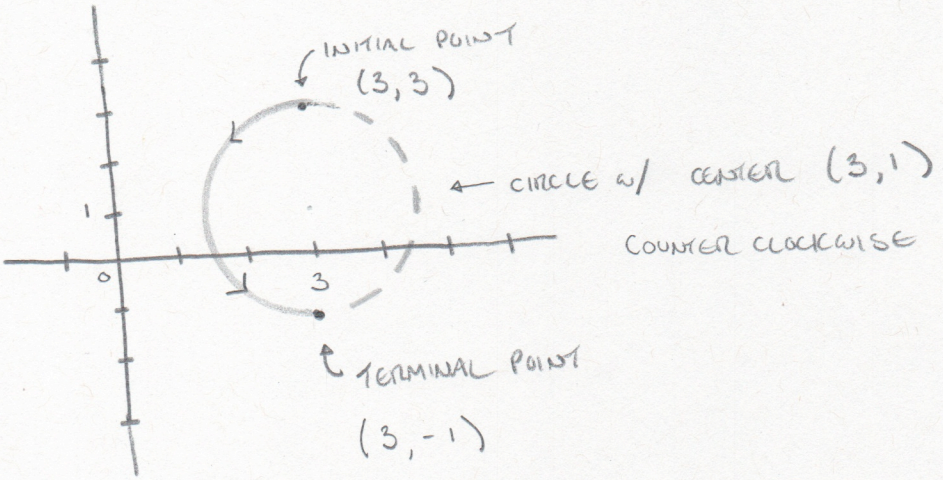

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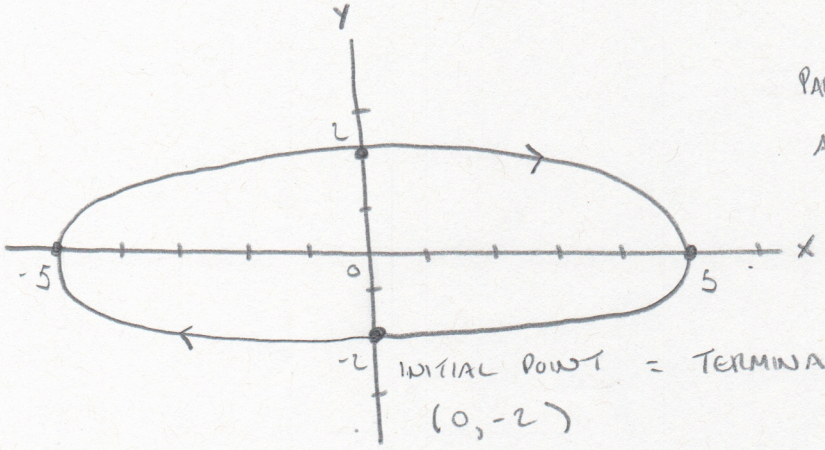


PARTICLE GOES 3 TIMES AROUND THE ELLIPSE COUNTER CLOCKWISE.

25 (a)

NOTE THAT WHEN $t=0$, $x = x_1$, $y = y_1$

AND WHEN $t=1$, $x = x_2$, $y = y_2$

SO THE CURVE PASSES THROUGH (x_1, y_1) & (x_2, y_2).

FURTHERMORE, $x = x_1 + (x_2 - x_1)t$ ↑ INITIAL POINT ↑ TERMINAL POINT.

$$\Rightarrow t = \frac{x - x_1}{x_2 - x_1}$$

$$\therefore y = y_1 + (y_2 - y_1)t = y_1 + (y_2 - y_1)\frac{x - x_1}{x_2 - x_1}$$

$$\Rightarrow y = \left[\frac{y_2 - y_1}{x_2 - x_1}\right]x - \left(\frac{x_1(y_2 - y_1)}{x_2 - x_1} - y_1\right) \sim mx + b$$

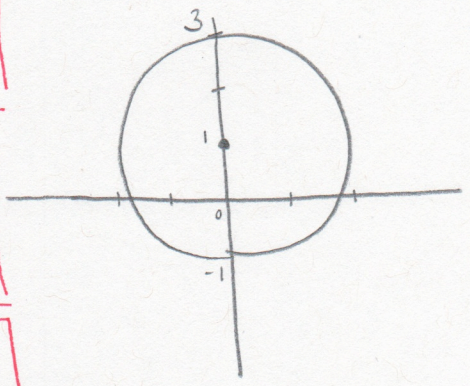
IS A STRAIGHT LINE.

(b) $x = -2 + (7+2)t$, $y = 3 + (-1-3)t$, $0 \le t \le 1$

27 (a) $x = 2\cos t$, $y = 1 - 2\sin t$, $0 \le t \le 2\pi$

(b) $x = 2\cos t$, $y = 1 + 2\sin t$, $0 \le t \le 6\pi$

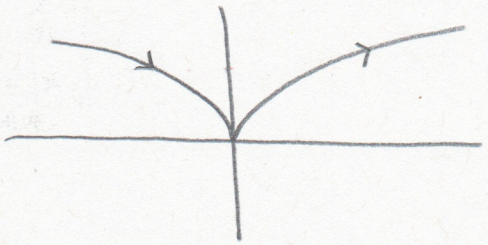
(c) $x = 2\sin t$, $y = 1 - 2\cos t$, $0 \le t \le \pi$



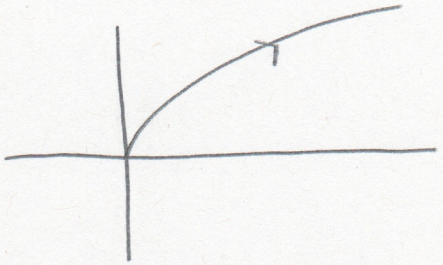
NOTE: THESE ANSWERS ARE NOT UNIQUE.

31 ALL CURVES ARE PIECES OF THE CURVE $x = y^{3/2}$ $\left(\text{i.e. } y = x^{2/3}\right)$

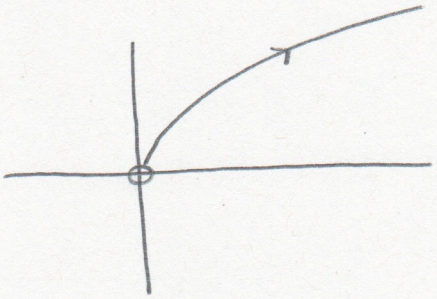
(a) GIVES THE WHOLE CURVE



(b) $x = t^6 = (t^3)^2 \geq 0$



(c) $x = e^{-3t} > 0$



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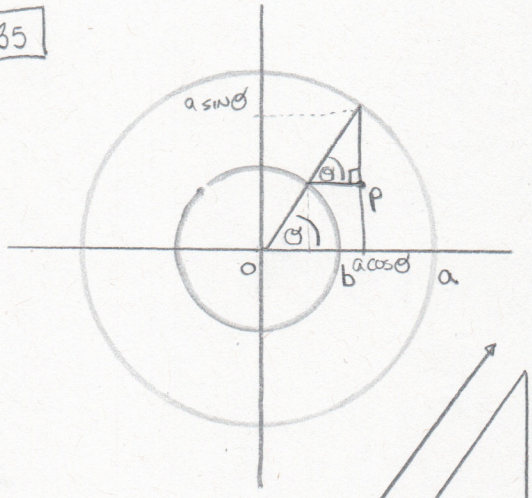

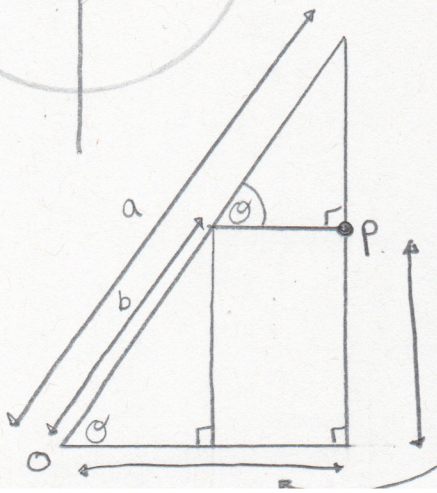

$\therefore \quad x = a\cos\theta, \quad y = b\sin\theta$

& $\left(\frac{x}{a}\right)^2 + \left(\frac{y}{b}\right)^2 = 1$

[ELLIPSE]