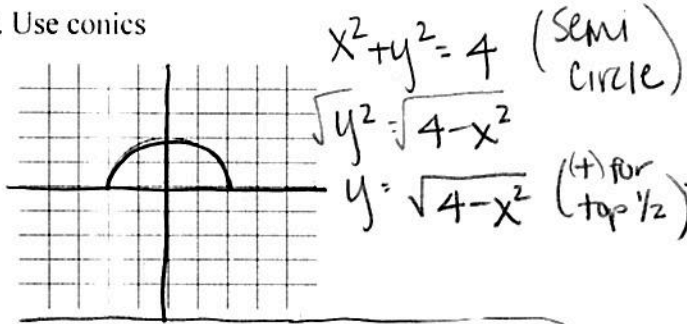


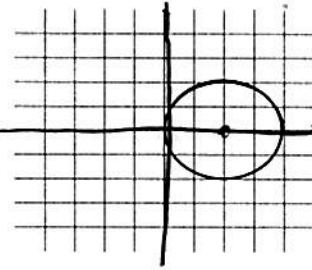
1. Write parametric equations and intervals for t for each of the following:

a. Use conics



$$\boxed{\begin{aligned} x_T &= t \\ y_T &= \sqrt{4 - t^2} \end{aligned} \text{ for } -2 \leq t \leq 2}$$

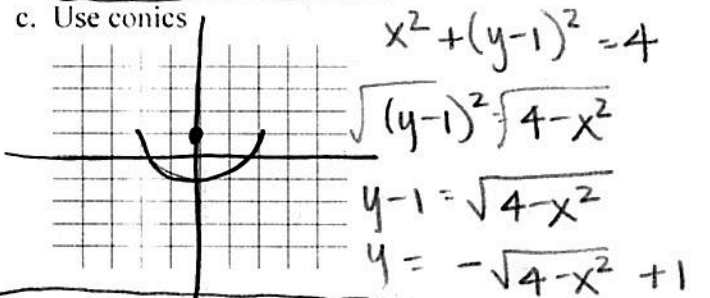
b. Use trig



Circle
 Center $(2, 0)$
 h, k
 $r = 2$

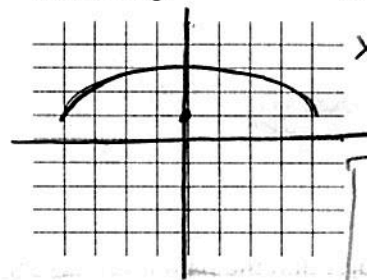
$$\boxed{\begin{aligned} x_T &= 2 \cos t + 2 \\ y_T &= 2 \sin t \end{aligned} \text{ for } 0 \leq t \leq 2\pi}$$

c. Use conics



$$\boxed{\begin{aligned} x_T &= t \\ y_T &= -\sqrt{4 - t^2} + 1 \end{aligned} \text{ for } -2 \leq t \leq 2}$$

d. Use trig



ellipse center $(0, 1)$
 h, k
 $x_{rad} = 2$ $y_{rad} = \sqrt{2}$

$$\boxed{\begin{aligned} x_T &= 4 \cos t \\ y_T &= 2 \sin t + 1 \end{aligned} \text{ for } 0 \leq t \leq \pi}$$

2. Find the rectangular equation by eliminating the parameter.

a. $x_t = 3t - 3$

$y_t = 2t + 1$

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

~~$\frac{x+3}{3} = \frac{y-1}{2}$~~
 $3(y-1) = 2(x+3)$
 $3y - 3 = 2x + 6$
 $3y = 2x + 9$
 $\frac{3y}{3} = \frac{2x}{3} + \frac{9}{3}$
 $y = \frac{2}{3}x + 3$

b. $x_t = t + 1$

$y_t = \frac{1}{t+1}$

$x = t + 1$
 $t = x - 1$

$y = \frac{x-1}{x-t+1}$

$y = \frac{x-1}{x}$
 or $y = 1 - \frac{1}{x}$

c. $x_\theta = 2 \cos \theta$

$y_\theta = 3 \sin \theta$

ellipse
 $x_{rad} = 2$
 $y_{rad} = 3$

center $(0, 0)$

$$\boxed{\frac{x^2}{4} + \frac{y^2}{9} = 1}$$

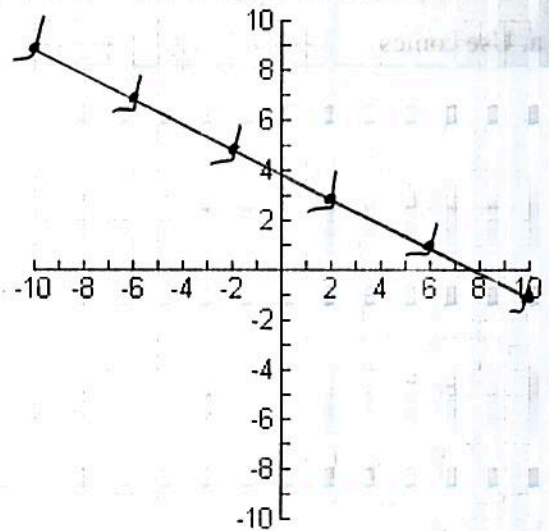
$$x = -10 + 4t$$

5) Graph the parametric equation

$$y = 9 - 2t$$

for the time interval $0 \leq t \leq 5$.

t	x =	y =
0	-10	9
1	-6	7
2	-2	5
3	2	3
4	6	1
5	10	-1



b) Eliminate the parameter and find the equation for the line.

$$x = -10 + 4t$$

$$\frac{x+10}{4} = \frac{4t}{4}$$

$$t = \frac{x+10}{4}$$

$$\rightarrow y = 9 - 2\left(\frac{x+10}{4}\right)$$

$$y = 9 - \frac{2x}{4} - \frac{20}{4}$$

$$\rightarrow y = -\frac{1}{2}x + 4$$

6) Brad goes to a party and the path he walks through the party is modeled by the equation

$$\begin{cases} x = 2 + 2t \\ y = 1 + t \end{cases}$$

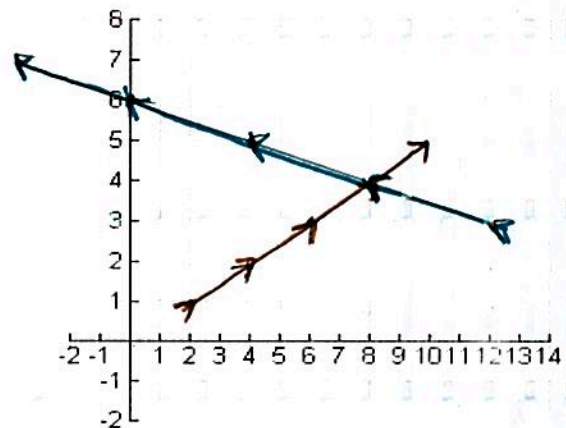
Angelina is also at the party and her path of travel is modeled by the equation

$$\begin{cases} x = 12 - 4t \\ y = 3 + t \end{cases}$$

For the time interval $0 \leq t \leq 4$

a) Graph the path of each through the party.

t	x=1	y=1	x=2	y=2
0	2	1	12	3
1	4	2	8	4
2	6	3	4	5
3	8	4	0	6
4	10	5	-4	7



b) Do their lines of travel intersect? Yes

c) Do Brad & Angelina run into each other? No If so, when? /