Monday, April 3, 2017

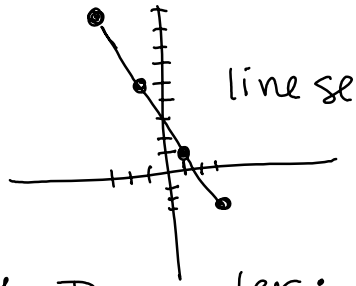
- ✓ Parametric Intro w/Partner
- ✓ Parametric Equations - on Calculator and Eliminating the Parameter
- ✓ HW: On Calendar/On Line :)

6.3 Parametric Equations

2 or more equations written in terms of a parameter (another variable) -can be t.

① $x = 2t - 3$
$y = 9 - 4t$ $\quad 0 \le t \le 3$

t	x	y
0	-3	9
1	-1	5
2	1	1
3	3	-3



line segment

Calculator:
MODE
parameter, Simultaneous
$X_{1T} = 2T - 3$
$Y_{1T} = 9 - 4T$
WINDOW
TMIN: 0
TMAX: 3
TSTEP: .1

Eliminate the Parameter:

$x = 2t - 3$
$y = 9 - 4t$ } Solve one equation for t and sub into other equation

$x + 3 = 2t$
$\frac{x+3}{2} = t$

$y = 9 - 4\left(\frac{x+3}{2}\right)$
$y = 9 - 2(x+3)$
$y = 9 - 2x - 6$

$y = 9 - 2x - 6$

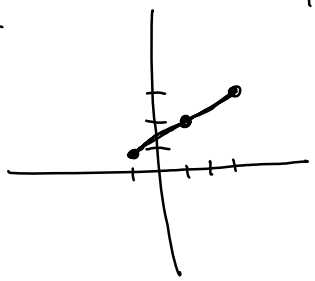
$\boxed{y = -2x + 3}$ (function)

(2) $x = 1 - 2t$
$y = 2 - t$ $\quad -1 \le t \le 1$

t	x	y
-1	3	3
0	1	2
1	-1	1

(a) Graph in Calculator → draw

(b) Eliminate parameter



$x = 1 - 2t$
$y = 2 - t$

$x - 1 = -2t$

$t = \frac{x-1}{-2}$

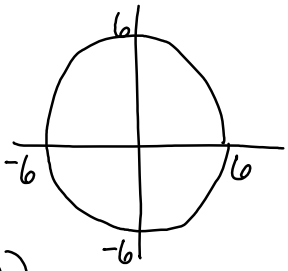
$t = -\frac{1}{2}x + \frac{1}{2}$ →

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

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

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

(3) $x = 6\cos t$
$y = 6\sin t$ $\quad 0 \le t \le 2\pi$



Circle w/ radius = 6
center (0,0)

Eliminate Parameter:

square both equations and add together.

$x^2 + y^2 = 36\cos^2 t + 36\sin^2 t$ → $= 1$ (Pythagorean Id.)

$x^2 + y^2 = 36(\cos^2 t + \sin^2 t)$

$\boxed{x^2 + y^2 = 36}$