

5.  $x + y = -1$        $y = -x - 1$

prob  $-2x + y = -7$

$-2x + -x - 1 = -7$

$$-3x - 1 = -7$$

$$-3x = -6$$

$$\frac{-3}{-3} = \frac{-6}{-3}$$

$$x = 2$$

$$y = -2 - 1$$

$$y = -3$$

$$(2, -3)$$

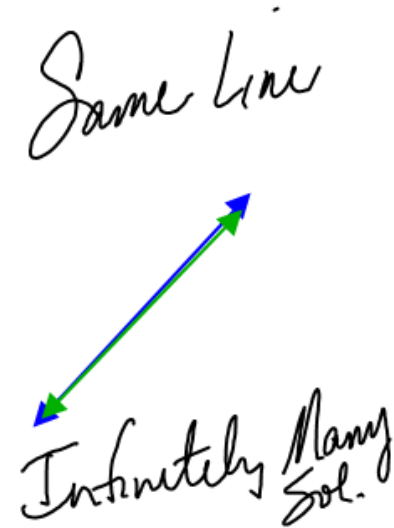
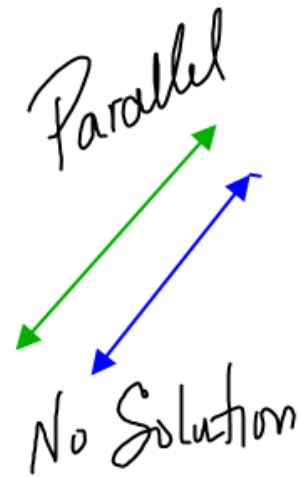
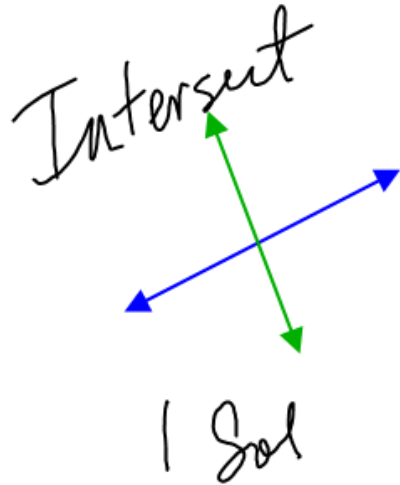
# Systems of Equations

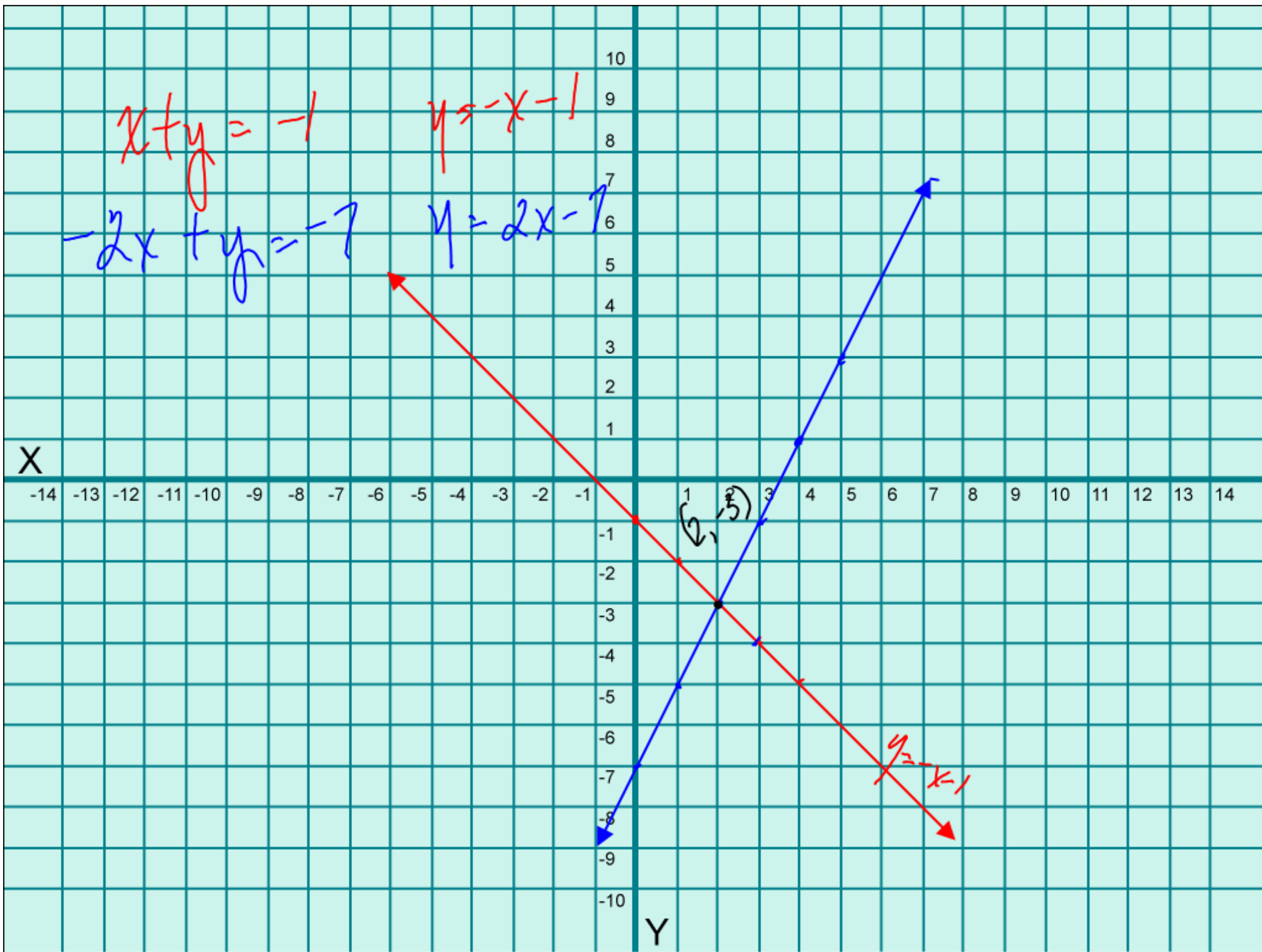
1. Graph

2. Substitution

3. Elimination Addition  
Subtraction

4. Matrices





$$x + y = -1$$

$$y = -x - 1$$

$$-2x + y = -7$$

$$y = 2x - 7$$

(2, -3)

$$y = x - 1$$

Substitution

$$A \quad x + y = -1$$

$$B \quad -2x + y = -7$$

1) Solve 1 equation for 1 variable  $A$ 

$$x + y = -1$$

$$x \quad \quad \quad -x \\ y = -x - 1$$

2) Substitute into the other equation  $B$ 

$$-2x + (y) = -7$$

$$-2x + -x - 1 = -7$$

$$-3x - 1 = -7$$

$$\frac{-3x}{-3} = \frac{-6}{-3}$$

$$x = 2$$

3) Back substitute to solve for  $y$ 

$$y = -x - 1$$

$$y = -2 - 1$$

$$y = -3$$

(2, -3)

$$9. \quad x - y = 0 \quad x = y$$

$$x^3 - 5x + y = 0$$

$$x^3 - 5x + x = 0$$

$$x^3 - 4x = 0$$

factor

$$x(x^2 - 4) = 0$$

$$x(x+2)(x-2) = 0$$

$$x=0 \quad x+2=0 \quad x-2=0$$

$$x=-2 \quad x=2$$

or

$$x=0 \quad x^2 - 4 = 0$$

$$\sqrt{x^2} = \sqrt{4}$$

$$x = \pm 2$$

$$x=y \quad (0,0) \quad (-2,-2) \quad (2,2)$$

13.

$$y = -x^2 + 1$$

$$y = x^2 - 1$$

$$-x^2 + 1 = x^2 - 1$$

$$\frac{2}{2} = \frac{2x^2}{2}$$

$$\sqrt{1} = \sqrt{x^2}$$

$$\pm 1 = x$$

$$y = x^2 - 1$$

$$y = 1^2 - 1$$

$$y = 0$$

$$(1, 0)$$

$$y = (-1)^2 - 1$$

$$y = 0$$

$$(-1, 0)$$

$$21. \quad -3x - .4y - .33 = 0$$

$$.1x - .2y - .21 = 0$$

$$30x - 40y - 33 = 0$$

$$10x - 20y - 21 = 0$$

29.

$$3x - 7y + 6 = 0$$

$$x^2 - y^2 = 4$$

$$-y^2 = -x^2 + 4$$

$$y^2 = x^2 - 4$$

Graph

$$\sqrt{y^2} = \sqrt{x^2 - 4}$$

$$y_1 = \sqrt{x^2 - 4}$$

$$y_2 = -\sqrt{x^2 - 4}$$



$$\begin{aligned} 29. \quad 3x - 7y + 6 = 0 & \quad 3x = 7y - 6 \\ x^2 - y^2 = 4 & \quad x = \frac{7}{3}y - 2 \end{aligned}$$

$$\left(\frac{7}{3}y - 2\right)\left(\frac{7}{3}y - 2\right) - y^2 = 4$$

$$\frac{49}{9}y^2 - \frac{28}{3}y + 4 - y^2 = 4$$

$$9 \cdot \frac{40}{9}y^2 - \frac{28}{3}y = 0 \cdot 9 \quad \frac{28}{3}$$

$$40y^2 - 84y = 0$$

$$4y(10y - 21) = 0$$

$$4y = 0 \quad 10y - 21 = 0$$

$$y = 0 \quad y = \frac{21}{10}$$

$$x = \frac{7}{3}y - 2$$

$$x = \frac{7}{3}(0) - 2$$

$$x = -2$$

$$x = \frac{7}{3}\left(\frac{21}{10}\right) - 2$$

$$x = \frac{147}{30} - \frac{60}{30}$$

$$x = \frac{87}{30}$$

$$x = \frac{29}{10}$$

$$(-2, 0)$$

$$\left(\frac{29}{10}, \frac{21}{10}\right)$$

Break Even

Revenue = Costs

$$9950x = 8650x + 250,000$$

41.

$$y = e^x$$

$$x - y + 1 = 0$$

$$-y = -x - 1$$

$$y = x + 1$$

$$(0, 1)$$

$$y = x + 1$$

$$1 = 0 + 1$$

$$1 = 1$$

$$y = e^x$$

$$1 = e^0$$

$$1 = 1$$

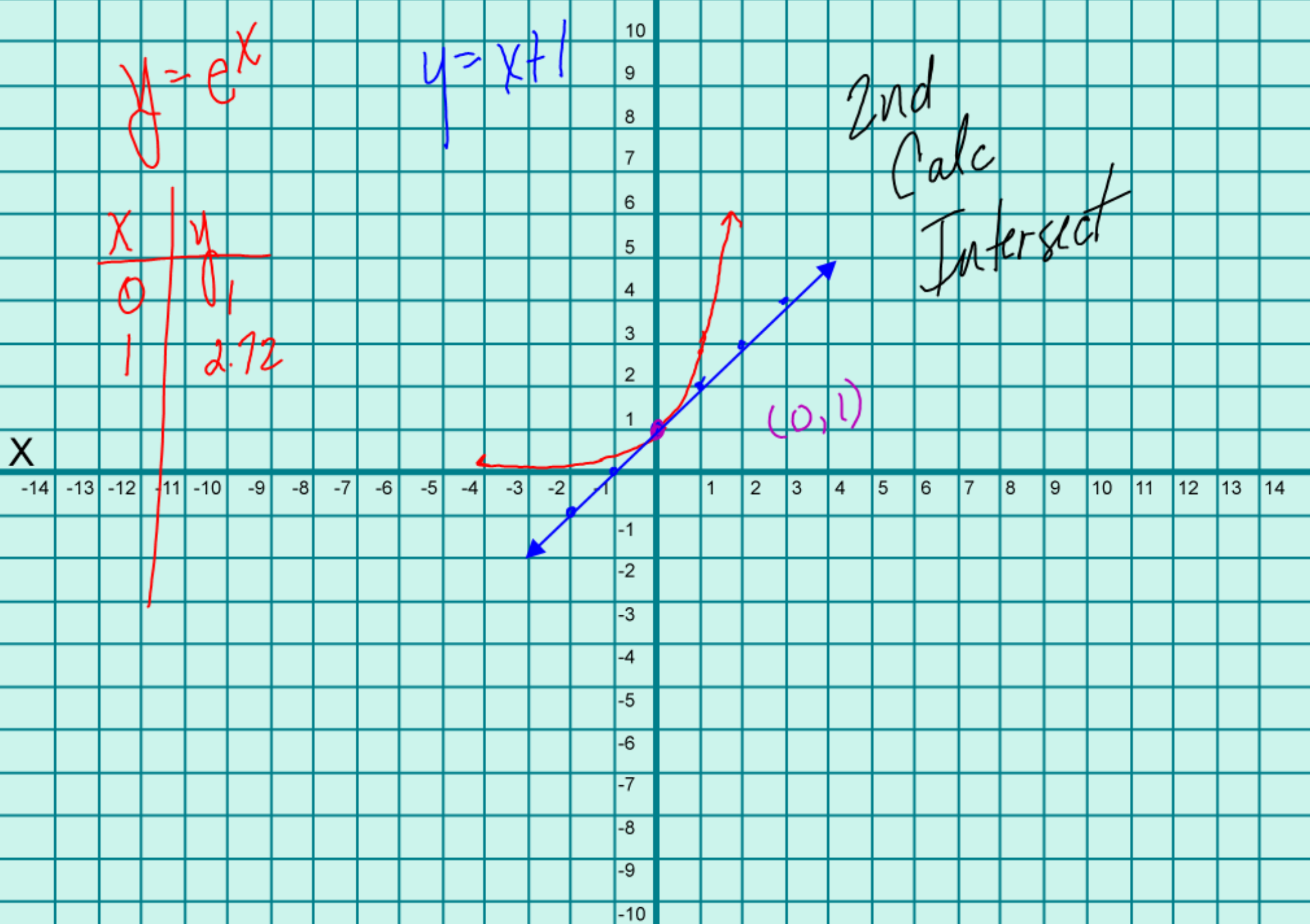
$$y = e^x$$

$$y = x + 1$$

X	y
0	1
1	2.72

X

Y



2nd  
Calc  
Intersect

(0, 1)