

11/26/18

$$\ln(5) + \ln(x-2) = 1.$$

$$\ln_e(5x-10) = 1.$$

$$5x-10 = e^1$$

$$5x = e + 10$$

$$x = \frac{e+10}{5} \text{ exact.}$$

$$x \approx 2.54 \text{ round.}$$

ej: $\log_3(x-2) - \log_3(x+4) = \log_3(2)$

$$\log_3\left(\frac{x-2}{x+4}\right) = \log_3(2)$$

$$\frac{x-2}{x+4} = 2$$

2) $x-2 = 2x+8$

$$x = -10$$

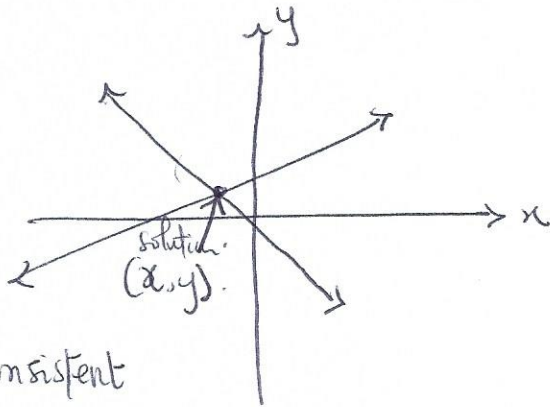
check: When (-10) is plugged back into original equation,

$$(-10-2) = -12 \Rightarrow \text{extraneous solution.}$$

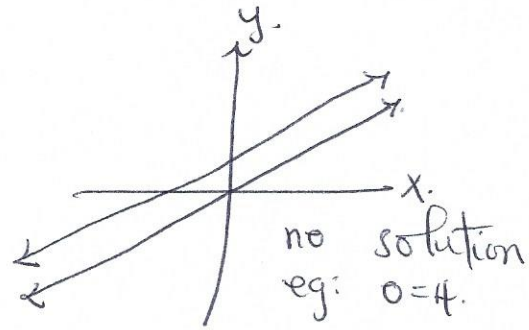
\therefore no solution.

8.1

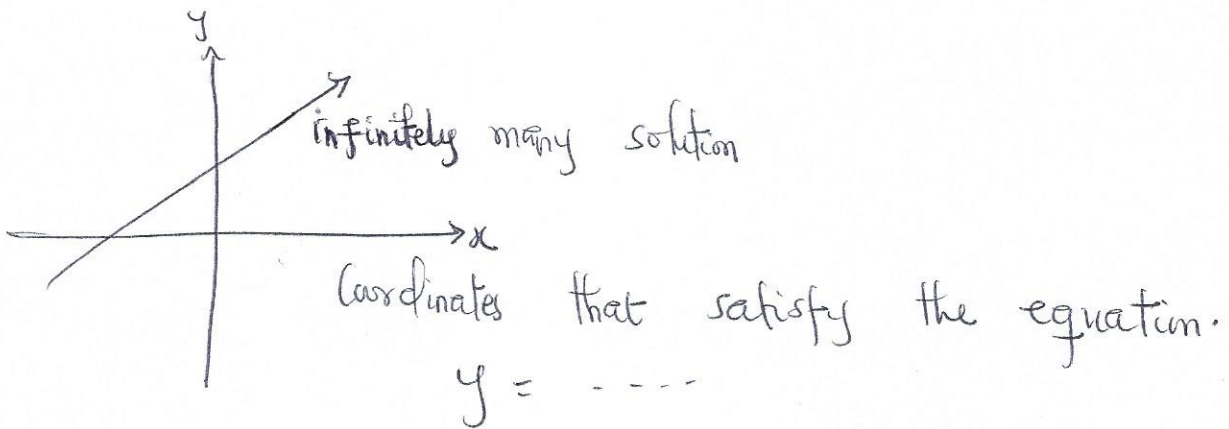
Solving Systems of Linear Equations.



consistent
dependent.



no solution
eg: $0=4$.
inconsistent.
no solution because x and y don't intersect.



Method 1: Substitution method:

eg: $x + 4y = -1$
 $5x + 7y = 21$

Solution:

$$x + 4y = -1 \Rightarrow x = -1 - 4y$$

put $x = -1 - 4y$ into $5x + 7y = 21$

$$\Rightarrow 5(-1 - 4y) + 7y = 21$$

$$\Rightarrow -5 - 20y + 7y = 21$$

$$-13y = 26$$

$$y = -26/13 = -2$$

put $y = -2$ into $x = -1 - 4y$.

$$\Rightarrow x = -1 - 4(-2).$$

$$x = -1 + 8 = \boxed{7}$$

∴ $\boxed{7, -2}$

Method 2: Elimination / Addition Method.

eg: $3x - 7y = -27$
 $-4x + 2y = 14$.

Soln: $(3x - 7y = -27) \times 2$

∴ $6x - 14y = -54$

Also: $(-4x + 2y = 14) \times 7$

∴ $-28x + 14y = 98$

∴ $6x - 14y = -54$
 $-28x + 14y = +98$

$$-22x = +44$$

$$x = -2$$

put ~~$x = -2$~~ $x = -2$ into second equation:

$$-4(-2) + 2(y) = 14$$

$$8 + 2y = 14 \Rightarrow 2y = 6 \Rightarrow y = 3$$

$$\boxed{-2, 3}$$

$$+ 2x - 3y = 4.$$

$$- 2x + 3y = -4.$$

solve y .

$$0 + 0 = 0.$$

Infinitely many solutions that satisfy $y = \frac{2}{3}x - \frac{4}{3}$.

$$5x - 2y = 6.$$

$$-10x + 4y = 7.$$

$$\Rightarrow 2(5x - 2y = 6)$$

$$-10x + 4y = 7$$

$$\Rightarrow 10x - 4y = 12$$

$$0 \neq 19$$

\Rightarrow no solution.

inconsistent system.

- 3 cupcakes and 7 cookies cost \$8.

- 5 cupcakes and 15 cookies cost \$15.

- How much does a cupcake cost?

- How much does a cookie cost?

let $x =$ price of a cupcake.

$y =$ price of a cookie.

$$\Rightarrow \begin{array}{l} -5(3x + 7y = 8) \\ 3(5x + 15y = 15) \end{array} \Rightarrow \begin{array}{l} \cancel{-15x + 35y = -40} \\ \end{array}$$

$$\Rightarrow -15x - 35y = -40$$

$$15x + 45y = 45$$

$$10y = 5 \Rightarrow y = \$0.5$$

$$c) \quad 5x + 15(0.5) = 15$$

$$5x = 15 - 7.5$$

$$5x = 7.5$$

$$x = \frac{7.5}{5}$$