

Warm-up

Solve

$$1) \quad 8x + 1 = 3x - 14$$

$$8x = 3x - 15$$

$$\frac{5x}{5} = \frac{-15}{5} \quad \boxed{x = -3}$$

$$2) \quad -4(x+3) = 5x+9$$

$$-4x - 12 = 5x + 9$$

$$\frac{-21}{9} = \frac{9x}{9}$$

$$\boxed{-\frac{7}{3} = x}$$

or

$$\boxed{-2\frac{1}{3}}$$

3) Find y given $8x - 3y = 10$
and $x = 8$

$$8x - 3y = 10$$

$$-10 + 3y \quad -10 + 3y$$

$$8x - 10 = 3y$$

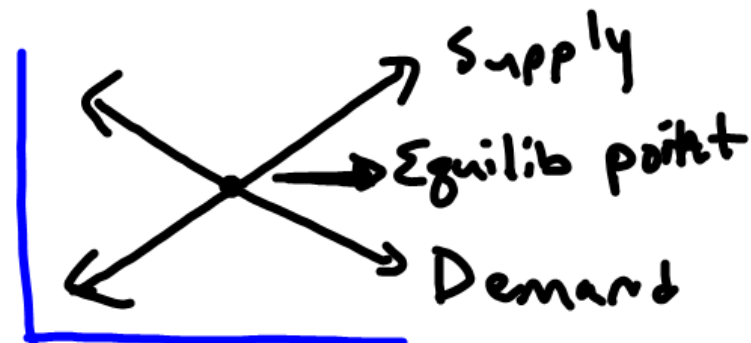
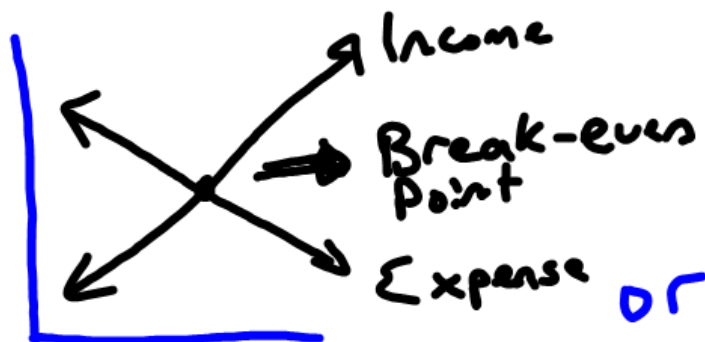
$$\boxed{y = \frac{8x - 10}{3}}$$

$$\rightarrow x = 8$$

$$y = \frac{8(8) - 10}{3} = \frac{54}{3} = \boxed{17}$$

3.1 Solve Linear Systems by Graphing

Economics - Income & Expenses / Supply & Demand

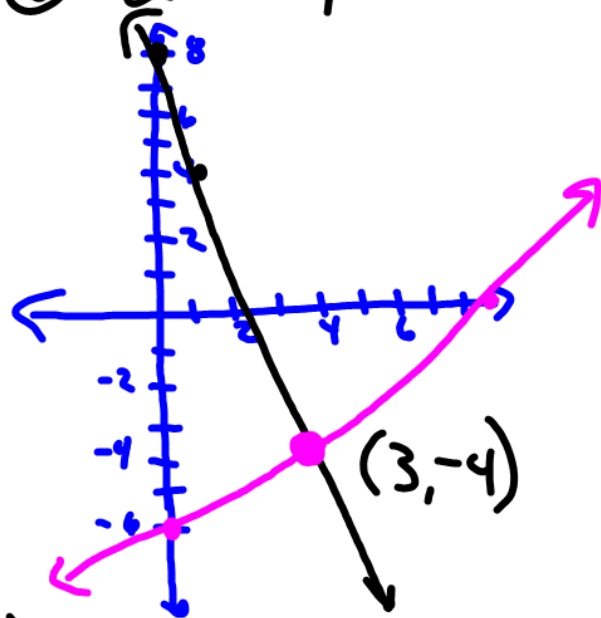


The Solution is the intersection.

Example

Solve the system by graphing & check it.

- ① $y = -4x + 8 \rightarrow y = mx + b$, $m = -\frac{4}{1}$, start @ 8 on y-axis
- ② $2x - 3y = 18 \rightarrow$ find x & y intercepts



$$\begin{array}{l} 2x = 18 \\ x = 9 \end{array} \quad \begin{array}{l} -3y = 18 \\ y = -6 \end{array}$$

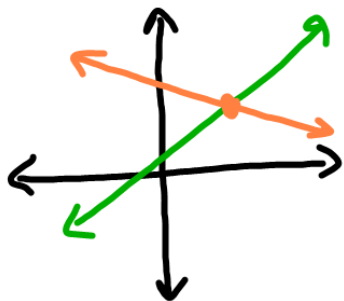
Check - plug $(3, -4)$ into both equations

$$\begin{array}{l} y = -4x + 8 \\ -4 = -4(3) + 8 \\ -4 = -4 - \text{yup!} \end{array}$$

$$\begin{array}{l} 2x - 3y = 18 \\ 2(3) - 3(-4) = 18 \\ 6 + 12 = 18 \rightarrow \text{yup!} \end{array}$$

3 possible things for 2 lines

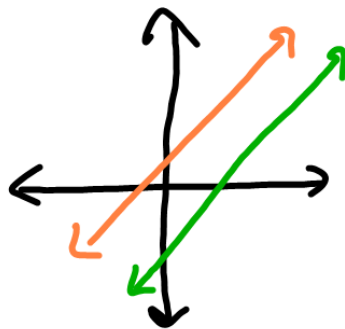
Intersecting



1 solution

Consistent,
Independent

Parallel Lines

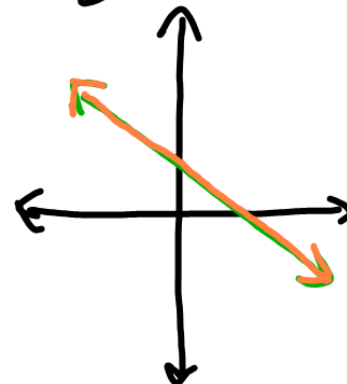


0 solutions
(don't cross)

Inconsistent

$$\begin{cases} y = 2x + 1 \\ y = 2x + 4 \end{cases} \text{ Same Slope}$$

Same Line



Infinite solutions
(are overlapping)

Consistent,
Dependent

Consistent - Has at least 1 solution

Inconsistent - Has no solution

Independent - Has exactly 1 solution

Dependent - Has infinite solutions