

Unit 5— Day 16

Special Cases Notes



Let's Warm Up those Brains!

1. Graph the following two lines.

$$y = 2x + 4$$

$$y = 2x - 2$$

a) Where do the lines intersect? How can you be sure?

Nowhere! Same slope → parallel lines!

b) What do you think the solution to the system is? Why?

No solution because never intersect

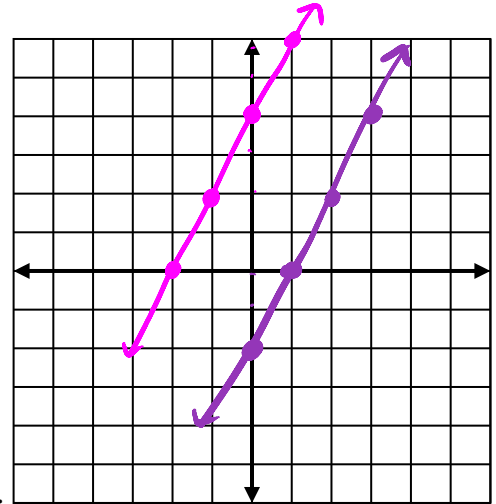
c) Without a graph, two lines are parallel if they have the:

(1) same slopes

AND

(2) Different y-intercepts

And the solution will always be NO SOLUTION.



2. Graph the following two lines.

$$y = -x + 3$$

$$2x + 2y = 6$$

$$\begin{array}{r} -2x \\ \hline 2x + 2y = 6 \\ -2x \quad -2x \end{array} \Rightarrow \frac{2y}{2} = \frac{-2x + 6}{2} \Rightarrow y = -x + 3$$

a) Where do the lines intersect? How can you be sure?

Everywhere! The equations are the same

b) What do you think the solution to the system is? Why?

Infinite solutions!

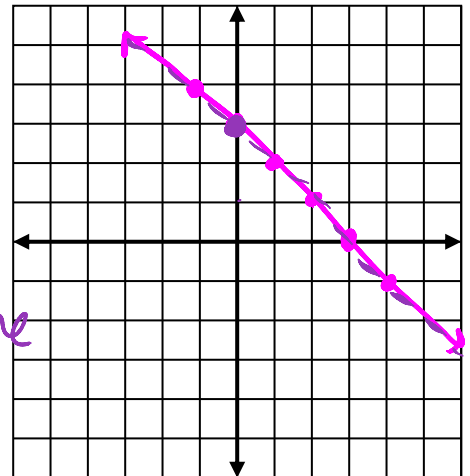
c) Without a graph, two lines are the same if they have the:

(1) same slopes

AND

(2) same y-intercepts

And the solution will always be Infinite solutions.



3. Graph the following lines.

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

$$-x + y = -1$$

$$\begin{array}{r} +x \quad +x \\ \hline \end{array}$$

$$y = x - 1$$

a) Where do the lines intersect? How can you be sure?

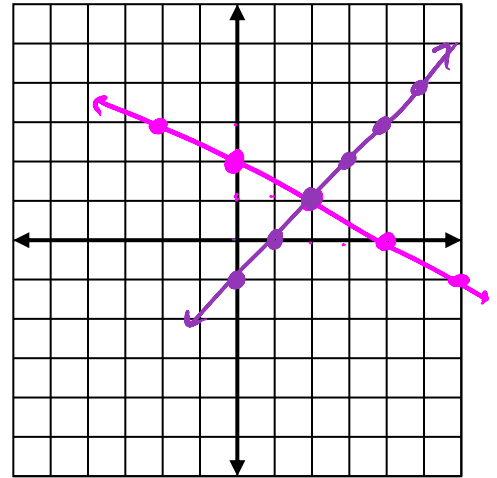
$(2, 1)$ I can plug it in and check!!

b) What do you think the solution to the system is? Why?

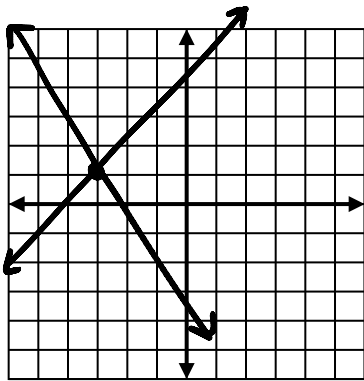
$(2, 1)$ because this is where the lines intersect

c) Without a graph, two lines are intersecting if they have:

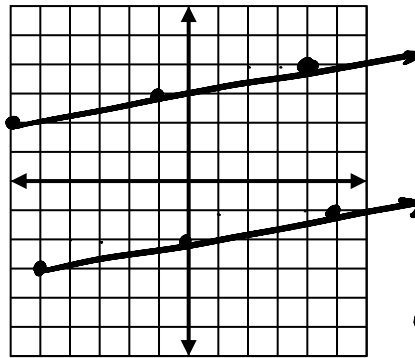
Different slope



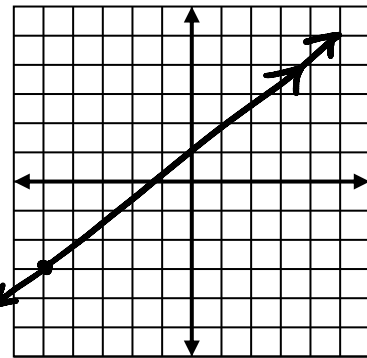
Which graph of a system of equations shows one solution, all solutions, or no solutions?



one solution



no solution



infinite solutions

Solve the system by using SUBSTITUTION to determine the number of solutions.

$$y = -1 - x$$

$$x + y = 8$$

$$x + -1 - x = 8$$

$$-1 = 8 \leftarrow \text{NO SOLUTION}$$

(Lines are parallel)

$$y = 2 - x$$

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

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

$$-2x - 4 + 2x = -4$$

$$-4 = -4 \leftarrow \text{True!}$$

Infinite solutions!!

Solve the system by using ELIMINATION to determine the number of solutions.

$$\begin{array}{r} 2(x + 3y = 15) \Rightarrow 2x + 6y = 30 \\ -2x - 6y = -30 \\ \hline 0 = 0 \end{array}$$

$$0 = 0$$

True!

Infinite solutions

$$3x + 2y = 10$$

$$\begin{array}{r} 3x + 2y = 10 \\ + -3x - 2y = -2 \\ \hline 0 = 8 \end{array}$$

$$0 = 8$$

False!

NO SOLUTION!