Name: Date: Period:

Let's refresh our memory….. Solve the following equations for x.

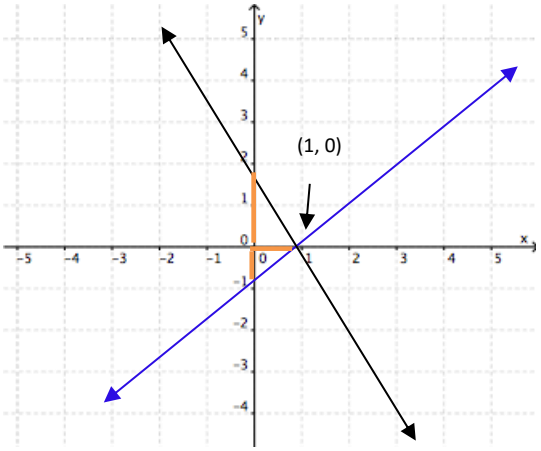
$2x + 6 = 8$	$2x - 4 = 2x + 8$	$4x + 8 = 2(2x + 4)$
⇧	⇧	⇧
What exactly does this solution mean?	What exactly does this solution mean?	What exactly does this solution mean?
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Different Types of Solutions to System of Equations Problems

When solving a system of equations (two equations, two variables), we can also have these three options. Let's look at examples.

$y = x - 1$ $\quad m = \frac{1}{1}$ $\quad b = -1$

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



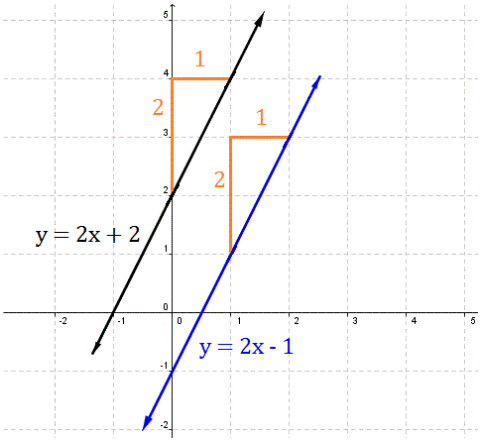
The **ONE SOLUTION** is the one point of intersection that will work in both equations, (1, 0). There is ONLY ONE POINT the 2 lines **SHARE**.

Tell me about the slopes (m) of these lines:

_____

$y = 2x + 2$ $\quad m = \frac{2}{1}$ $\quad b = 2$

$y = 2x - 1$ $\quad m = \frac{2}{1}$ $\quad b = -1$



_____ lines will NEVER cross, therefore there is **NO SOLUTION**. These 2 lines will **NEVER SHARE** a point.

Tell me about the slopes (m) of these lines:

_____

Tell me about the y-intercepts (b) of these lines:

_____

$y = 2x + 1$

$m = \frac{2}{1}$

$b = 1$

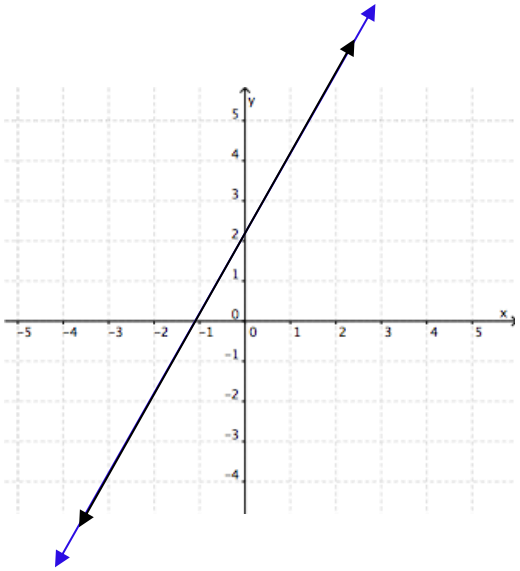
$y - 3 = 2x - 2$

$+3 \quad +3$

$y = 2x + 1$

$m = \frac{2}{1}$

$b = 1$



Tell me about the slopes (m) of these lines:

_____

Tell me about the y-intercepts (b) of these lines:

_____

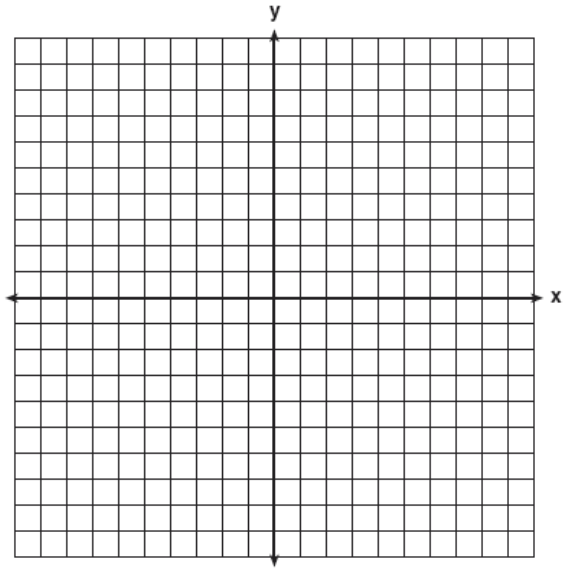
This example has **INFINITE SOLUTIONS**. There are an infinite number of points these 2 lines **SHARE** because it is the SAME line.

In summary:

There are **3** different TYPES of solutions to a system of equations problem. They are:

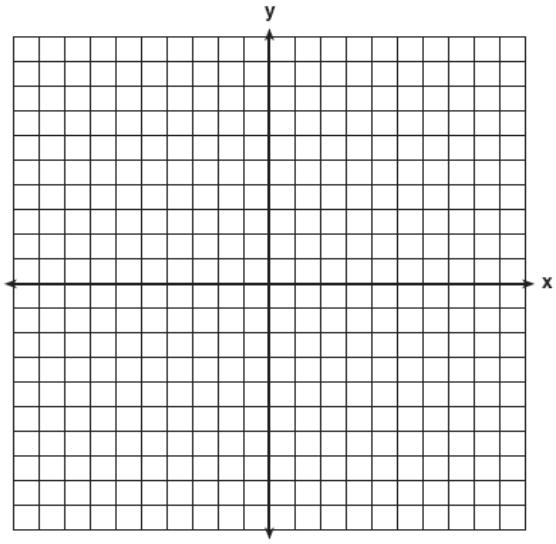
_____ Solution	_____ Solution(s)	_____ Solution(s)
Two _____ lines with _____ slopes. The y-intercepts may or may not be the same.	Two _____ lines with _____ slopes, but _____ y-intercepts.	Two lines with _____ slopes and _____ y-intercepts.
There is _____ solution because the	There is/are _____ solution(s) because	There is/are _____ solution(s) because

Solve the following systems of equations.



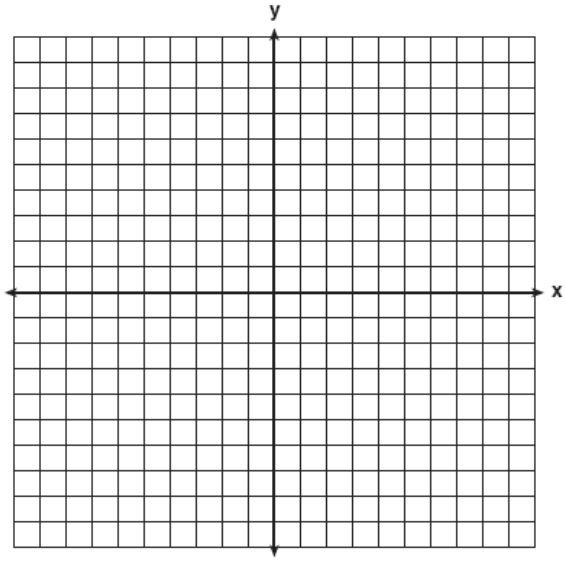
$y = 2x + 3$

$y = -\frac{3}{2}x - 4$



$y = 3x - 2$

$y = 3x + 4$



$y = \frac{1}{2}x - 4$

$2y = 1x - 8$