

Systems of Equations EXPLORATION

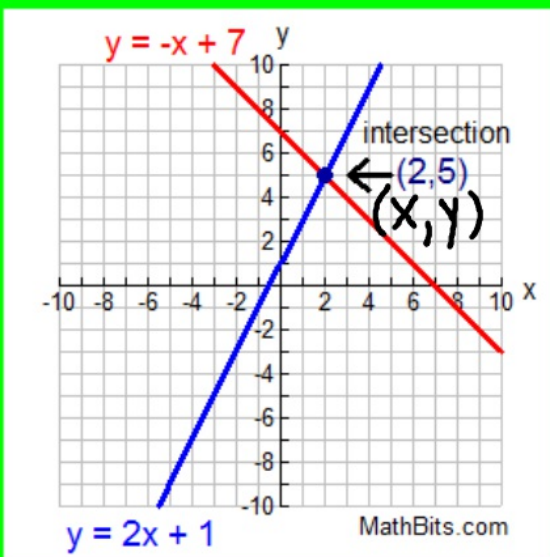
Equations	$3x + 2y = -8$ $x - y = -1$	$x - 4y = 8$ $y = \frac{1}{4}x + 3$	$3x + y = 2$ $6x + 2y = 4$
Slope-Intercept Form	$\begin{array}{r} 3x + 2y = -8 \\ -3x \quad -3x \\ \hline 2y = -3x - 8 \\ \frac{2y}{2} = \frac{-3x}{2} - \frac{8}{2} \\ y = -\frac{3}{2}x - 4 \end{array}$	$\begin{array}{r} x - 4y = 8 \\ -x \quad -x \\ \hline -4y = -x + 8 \\ \frac{-4y}{-4} = \frac{-x}{-4} + \frac{8}{-4} \\ y = \frac{1}{4}x - 2 \end{array}$	
Graphs	<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> $\begin{array}{r} x - y = -1 \\ -x \quad -x \\ \hline -y = -x - 1 \\ \frac{-y}{-1} = \frac{-x}{-1} - \frac{1}{-1} \\ y = x + 1 \end{array}$ </div> </div>		

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

$$\begin{array}{r} 6x + 2y = 4 \\ -6x \quad -6x \\ \hline 2y = -6x + 4 \\ \frac{2y}{2} = \frac{-6x}{2} + \frac{4}{2} \\ y = -3x + 2 \end{array}$$

Systems of Equations

SYSTEMS OF EQUATIONS	<i>two or more linear equations in the same variable</i>
<i>The SOLUTION to a System</i>	Graphically: The point (x, y) where the two lines <u>intersect</u> .
	Algebraically: The point (x, y) that makes both equations <u>equal</u> .

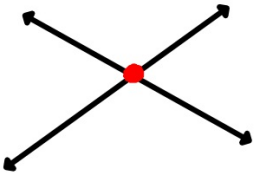
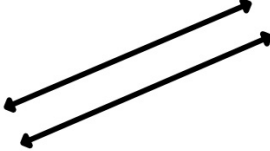
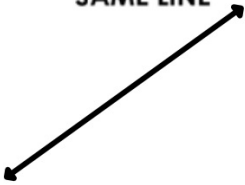


How can you prove that a coordinate point is a solution to the system of equations?

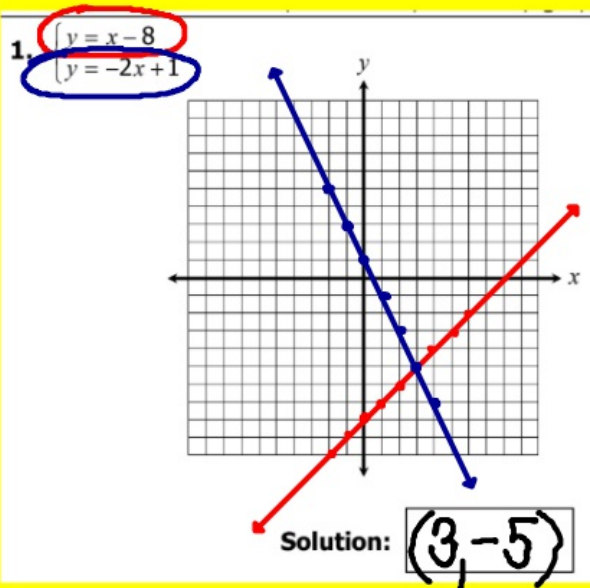
$$\begin{aligned}
 y &= -x + 7 \\
 5 &= -(2) + 7 \\
 5 &= 5 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 y &= 2x + 1 \\
 5 &= 2(2) + 1 \\
 5 &= 5 \checkmark
 \end{aligned}$$

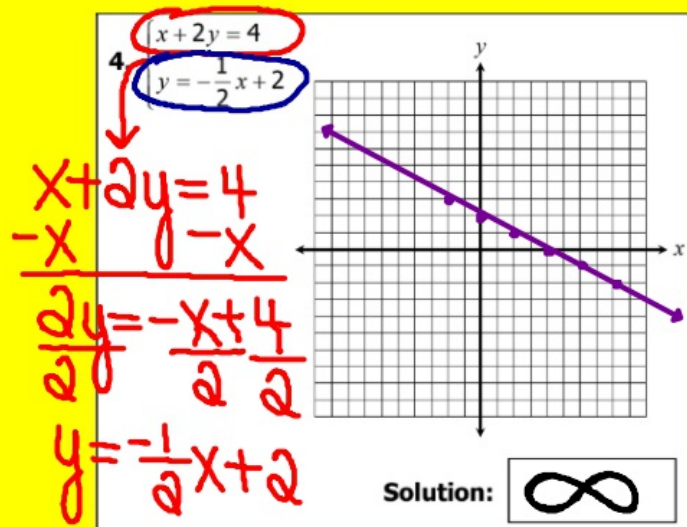
same slope!

TYPES OF SOLUTIONS	INTERSECTING LINES 	PARALLEL LINES 	SAME LINE 
	ONE SOLUTION (X, Y)	NO SOLUTION \emptyset	INFINITE SOLUTION ∞
SOLVING SYSTEMS BY GRAPHING	1.	Put equations in slope-intercept form.	
	2.	Use slope and y-intercept to graph both lines.	
	3.	Identify the solution.	

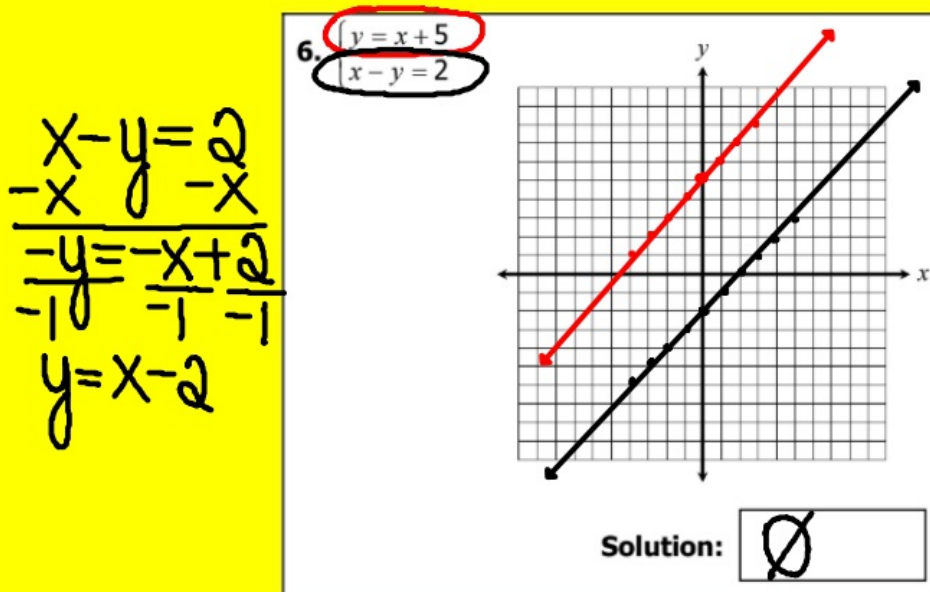
One Solution



Infinite Solutions



No Solution



So you want to use the calculator?

1.) Solve each equation for y.

2.) Enter both equations into Y =

$Y_1 =$ _____

$Y_2 =$ _____

3.) Graph

4.) 2nd--> Trace--> 5:Intersection

5.) Enter, Enter, Enter.

Try #3 and
#4 using
the calculator.