

Name \_\_\_\_\_

## Graphing 2x2 Systems

### Getting Started

Consider the system:

$$y = -2x + 3$$

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

For each equation, make a table of ordered pairs  $(x,y)$ . Then graph each line.

- Which ordered pair appears in both tables?

$y = -2x + 3$	
x	y
0	
1	
2	
3	
4	

$y = \frac{1}{2}x - 2$	
x	y
0	
1	
2	
3	
4	

- What do we call this point, in terms of the system? \_\_\_\_\_
- What do we call this point in terms of the graph? \_\_\_\_\_

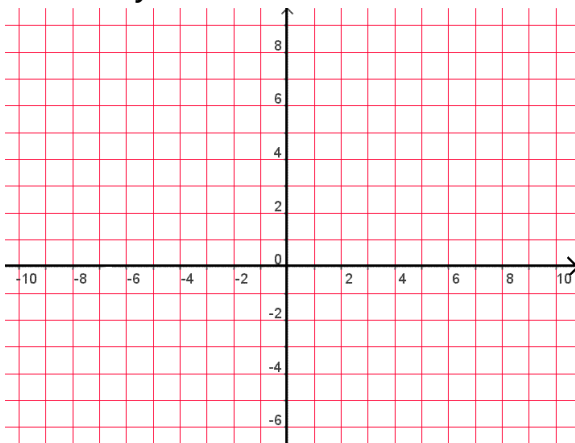
### IMPORTANT:

When the equations in a system can be \_\_\_\_\_,  
then the \_\_\_\_\_ to the system can be described  
using the \_\_\_\_\_ of the \_\_\_\_\_ of \_\_\_\_\_.

- Why?

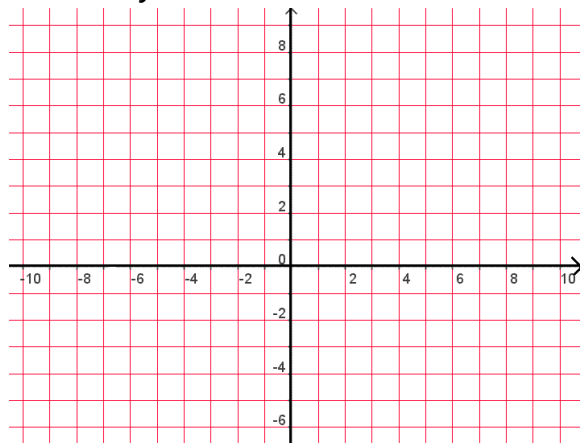
Use the slope and intercept of each linear equation to generate the graphs. Then state the solution to the system.

1) System:  $y = \frac{3}{2}x + 2$   
 $y = 3x - 1$



Solution:

2) System:  $y = -\frac{2}{3}x + 7$   
 $y = x - 3$

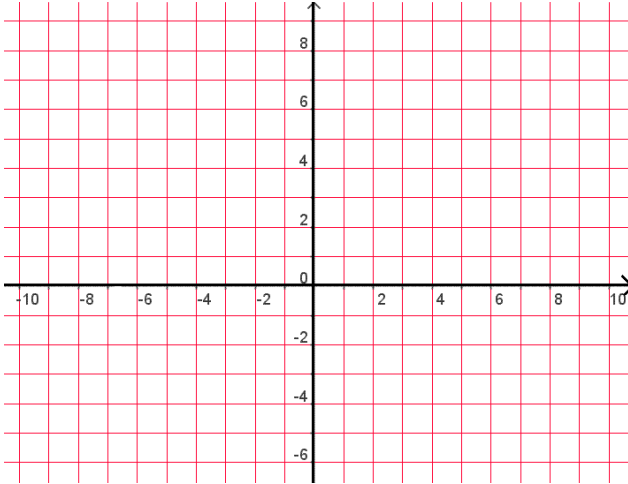


Solution:

# Graphing 2x2 Systems

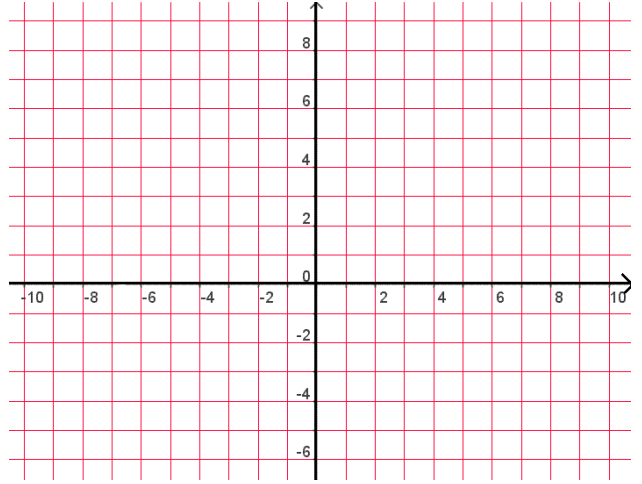
Continue graphing to find the solution to each system.

3) System:  $y = \frac{5}{2}x + 7$   
 $y = \frac{3}{4}x$



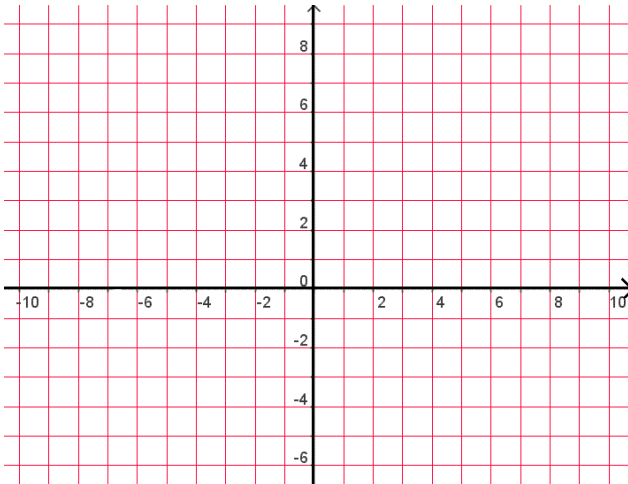
Solution:

4) System:  $y = -\frac{3}{2}x + 1$   
 $y = \frac{1}{2}x + 5$



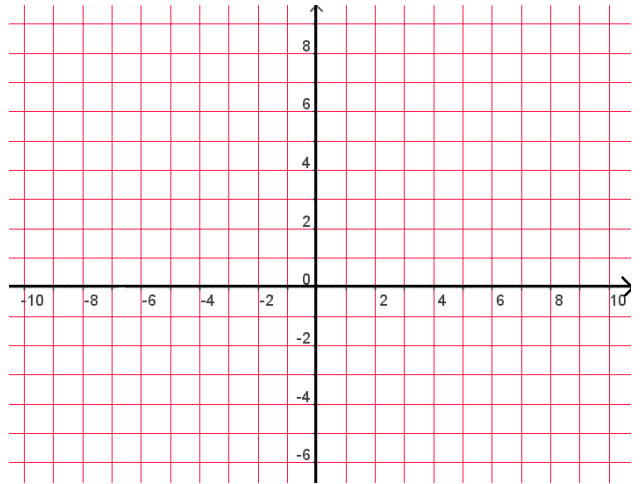
Solution:

5) System:  $y = 5$   
 $y = -\frac{1}{3}x + 3$



Solution:

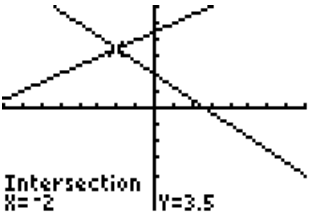
6) System:  $y = 2x - 1$   
 $y = 3 + 2x$

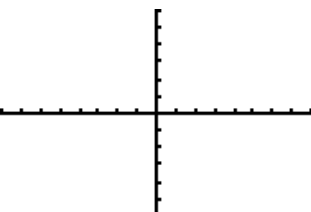


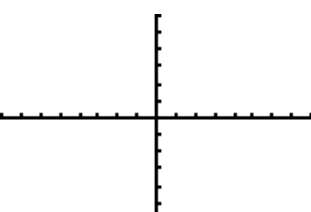
Solution:

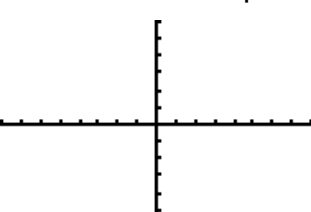
## Graphing 2x2 Systems

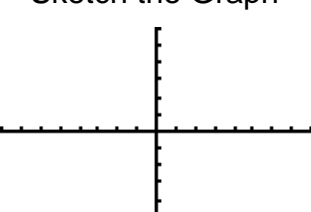
Systems of equations can also be solved using the **CALC 5: intersect** command on a graphing calculator. However, before equations can be entered, you must solve each equation for "y".

Sample	System	Equations in "Y=" form	Sketch the Graph	Table Check	Solution																		
	$-x + 2y = 9$ $3x + 4y = 8$	$Y_1 = 0.5x + 4.5$  $Y_2 = (-\frac{3}{4})x + 2$		<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th>x</th> <th>Y1</th> <th>Y2</th> </tr> </thead> <tbody> <tr><td>-4</td><td>2.5</td><td>5</td></tr> <tr><td>-3</td><td>3</td><td>4.25</td></tr> <tr><td><b>-2</b></td><td><b>3.5</b></td><td><b>3.5</b></td></tr> <tr><td>-1</td><td>4</td><td>2.75</td></tr> <tr><td>0</td><td>4.5</td><td>2</td></tr> </tbody> </table>	x	Y1	Y2	-4	2.5	5	-3	3	4.25	<b>-2</b>	<b>3.5</b>	<b>3.5</b>	-1	4	2.75	0	4.5	2	(-2, 3.5)
x	Y1	Y2																					
-4	2.5	5																					
-3	3	4.25																					
<b>-2</b>	<b>3.5</b>	<b>3.5</b>																					
-1	4	2.75																					
0	4.5	2																					

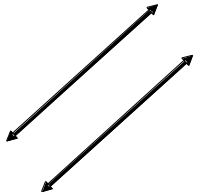
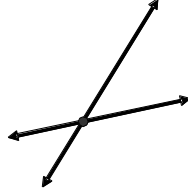

7)	System	Equations in "Y=" form	Sketch the Graph	Table Check	Solution																		
	$2x + y = 5$ $4x + y = 12$	$Y_1 =$  $Y_2 =$		<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th>x</th> <th>Y1</th> <th>Y2</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	x	Y1	Y2																
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8)	System	Equations in "Y=" form	Sketch the Graph	Table Check	Solution																		
	$4x + 7y = 14$ $8y + 8 = 5x$	$Y_1 =$  $Y_2 =$		<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th>x</th> <th>Y1</th> <th>Y2</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	x	Y1	Y2																
x	Y1	Y2																					

9)	System	Equations in "Y=" form	Sketch the Graph	Table Check	Solution																		
	$3x - 5y = 30$ $6x + 20 = 10y$	$Y_1 =$  $Y_2 =$		<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th>x</th> <th>Y1</th> <th>Y2</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	x	Y1	Y2																
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10)	System	Equations in "Y=" form	Sketch the Graph	Table Check	Solution																		
	$-3x + y = 5$ $10 + 6x = 2y$	$Y_1 =$  $Y_2 =$		<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th>x</th> <th>Y1</th> <th>Y2</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>	x	Y1	Y2																
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## Graphing 2×2 Systems

When solving systems (such as by graphing), three different cases can occur.			
What type of <u>lines</u> ?	The lines are _____	The lines _____	The lines _____
What type of <u>system</u> ?	_____	_____	_____
What type of <u>solutions</u> ?	_____ solutions	_____ solution (represented by the _____).	An _____ of solutions (or, every _____ on the line).
Other Vocabulary	Sometimes, the “_____” is used to describe the solution to such a system.  Symbol: _____	If the two equations in the system graph into lines which intersect at a single point, then they are called _____ equations.	If the two equations in the system have the <i>same graph</i> , then they are called _____ equations.

On graph paper or on a calculator, solve each system graphically. Then describe:

- The type of lines—parallel, intersecting, or coincident (coinciding).
- The type of system— inconsistent, consistent/independent, or consistent/dependent.
- The type of solutions—one solution, no solutions, or infinitely many solutions.
- If the solution exists, state it as an ordered pair.

11)  $y = 2x + 4$   
 $y = \frac{1}{3}x - 1$

12)  $y = -\frac{3}{2}x + 1$   
 $y = -3x + 7$

13)  $y = \frac{2}{5}x - 1$   
 $y = \frac{2}{3}x - 3$

14)  $y = -3x + 5$   
 $12x + 4y = 20$

15)  $4x - 2y = -10$   
 $-6x + 3y = 12$

16)  $y = 0.8x + 2$   
 $5x - 4y = 8$