Determine whether the lines are **parallel, perpendicular, or neither**?

31. $y = -2x + 6$ and $2x + y = 4$

$m = -2$
$b = 6$

$y = -2x + 4$
$m = -2$
$b = 4$

parallel

32. $-4x + y = -2$ and $x + 4y = 8$

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

$4y = -x + 8$
$y = -\frac{1}{4}x + 2$
$m = -\frac{1}{4}$

Perpendicular

33. What is the equation of the line that passes through the point (1, 5); and is **parallel** to the equation. $y = -2x - 4$

34. What is the equation of the line that passes through the point (6, -2); and is **parallel** to the equation. $y = -\frac{1}{2}x - 4$

35. What is the equation of the line that passes through the point (6, -2); and is **perpendicular** to the equation.

$y = \frac{1}{3}x + 2$

36. What is the equation of the line that passes through the point (4, -5); and is **perpendicular** to the equation.

$y = -2x + 1$

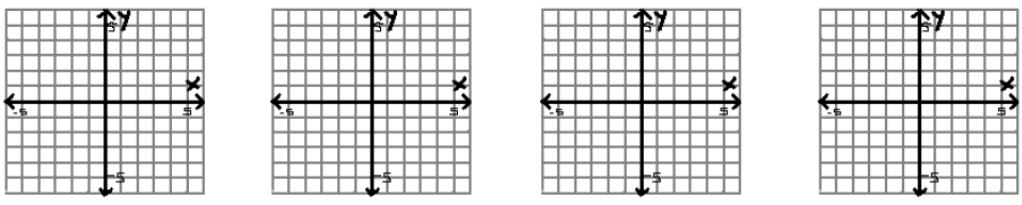
Graph the following linear inequalities using any method. (Don't forget to shade.)

37. $y < 2x - 3$

38. $y \geq -\frac{2}{3}x + 5$

39. $9x + 6y > 18$

40. $-12x - 6y \leq 24$



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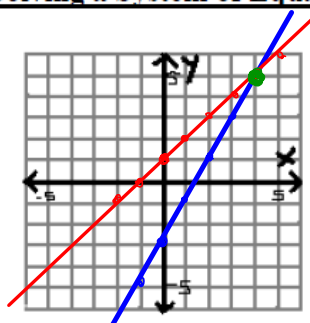
6–1 Solving Systems by Graphing

Two or more linear equations together form a SYSTEM OF EQUATIONS. One way to solve a system of linear equations is by GRAPHING each equation. Look for the point common to both the lines. Any ordered pair in a system that makes BOTH the equations true, is a SOLUTION to the system of linear equations.

Example 1: Solving a System of Equations by Graphing:

1. $y = 2x - 3$
   $y = x + 1$

$m = 2$, $b = -3$; $m = 1$, $b = 1$

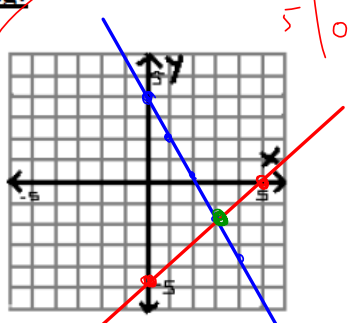


The solution to the system is: (4 , 5) (x, y)

2. $x - y = 5$
   $2x + y = 4$

$y = -2x + 4$, $m = -2$, $b = 4$

x	y
0	-5
5	0



The solution to the system is: (3 , -2)

Check: If the point works algebraically in BOTH equations, then you know you have the right SOLUTION point to the SYSTEM..

$y = 2x - 3$
$5 = 2(4) - 3$
$5 = 8 - 3$
✓

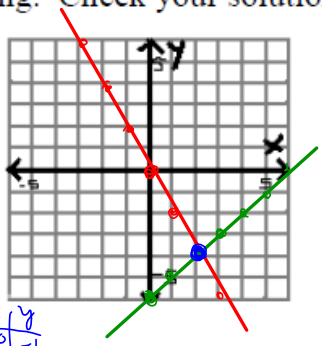
$y = x + 1$
$5 = 4 + 1$
✓

√ Understanding Check:

Solve by graphing. Check your solution algebraically.

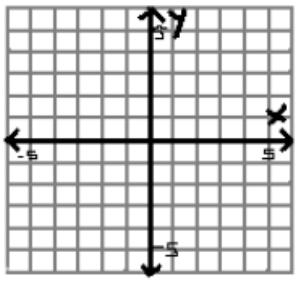
a. $y = x - 6$
$y = -2x$

solution:
(2 , -4)



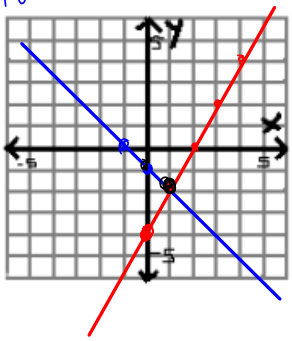
b. $y = -\frac{1}{2}x + 2$
$y = -3x - 3$

solution:
(,)



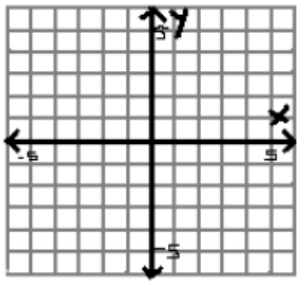
c. $3x + 3y = -3$
$4x - 2y = 8$

solution:
(1 , -2)



d. $-6x + 2y = -6$
$-3x + 6y = 12$

solution:
(,)



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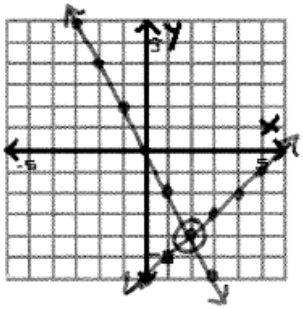
√ Understanding Check:

Solve by graphing. Check your solution algebraically.

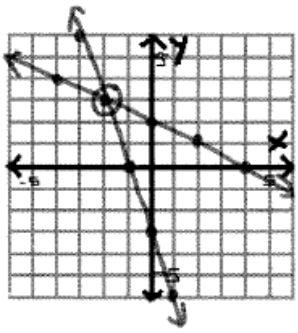
a. $y = x - 6$
$y = -2x$

solution:
(2 , -4)



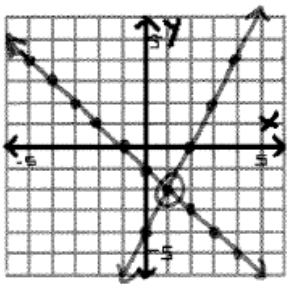
b. $y = -\frac{1}{2}x + 2$
$y = -3x - 3$

solution:
(-2 , 3)



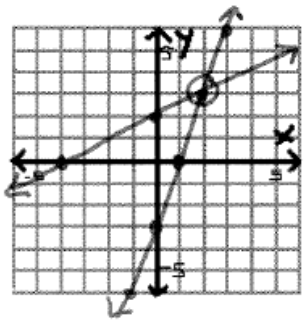
c. $3x + 3y = -3$
$4x - 2y = 8$

solution:
(1 , -2)



d. $-6x + 2y = -6$
$-3x + 6y = 12$

solution:
(2 , 3)



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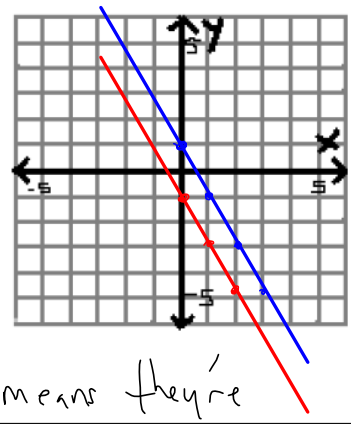
Example 2: Systems with No Solutions:

Solve by graphing. $y = -2x + 1$ $y = -2x - 1$

$m = -2$ $b = 1$

$m = -2$ $b = -1$



What do you notice?

parallel ~ don't intersect

Why can't there be a solution?

they don't intersect

Without graphing, how can you tell if a system will have a solution or not?

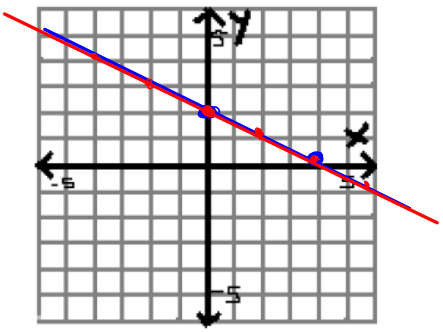
Same slope with different y-int means they're parallel ... NO SOLUTION.

x	y
0	2
4	0

Example 3: Systems with Infinitely Many Solutions:

Solve by graphing. $2x + 4y = 8$ $y = -\frac{1}{2}x + 2$

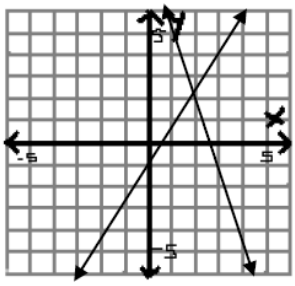
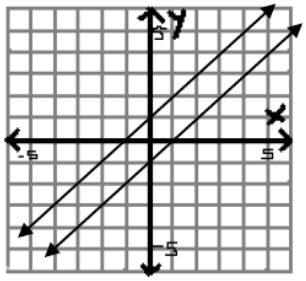
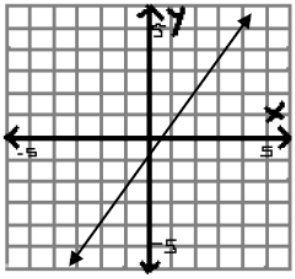
$m = -1/2$ $b = 2$



Why are there infinite ordered pair solutions?

The lines are the same, so they intersect at all points along the line.

Summary of Numbers of Solutions of Systems of Linear Equations

different slopes	same-slope, but different y-intercepts	same slope, and same y-interecepts
		
The lines intersect so there is one solution.	The lines are parallel so there are no solutions.	The lines are the same there are infinitely many solutions.

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* Homework: HW Page 58

* Unit 5 Test 2/4 or 2/5... study!