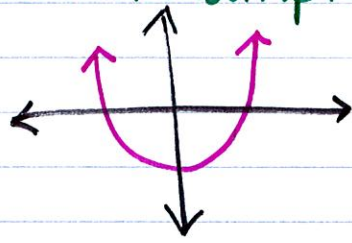
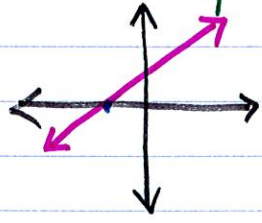


# Lesson 8-3

## 2/8/12 Representing Linear Functions (p406-411)

Linear Equation: an equation whose graph is a straight line

Example vs Non-Example



ex: Write four solutions for each equation.

$$y = x + 2$$

x	y
(-1)	(3)
(9)	(11)
(2)	(4)
(6)	(8)

The solutions must be written as ordered pairs.

(x, y)

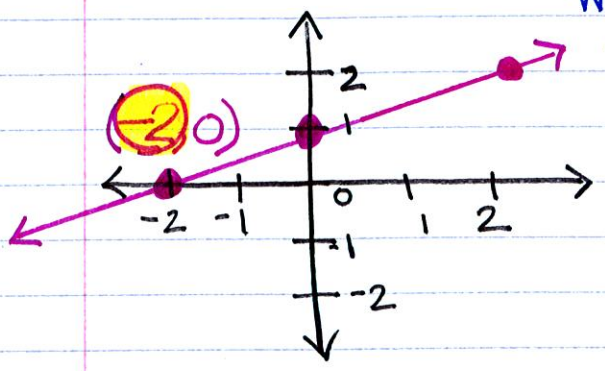
$$\begin{array}{r} \text{ex: } -2x + y = 4 \\ + 2x \quad + 2x \\ \hline y = 2x + 4 \end{array}$$

make sure the equation is solved for "y"

x	y
(3)	(10)
(7)	(18)
(400)	(804)



X-intercept: the x-coordinate of the point where the line crosses the x-axis



Y-intercept: the y-coordinate of the point where the line crosses the y-axis

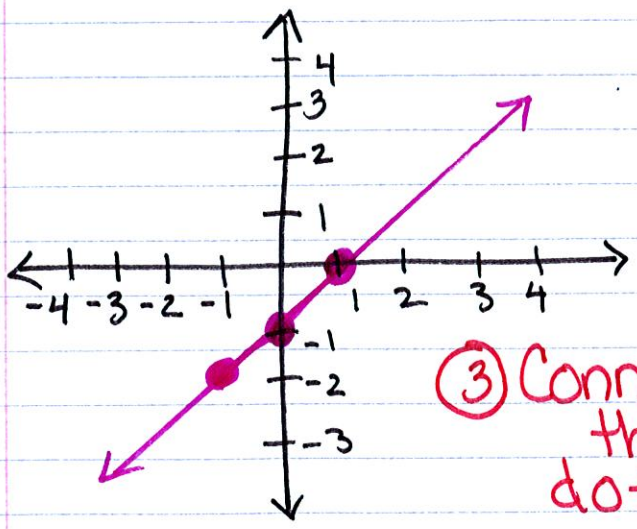
Graph each equation by plotting the ordered pairs

$y = x - 1$

x	y
-1	-2
0	-1
1	0

① Find 3+ ordered pairs (through the use of a t-chart)

② Graph your ordered pairs

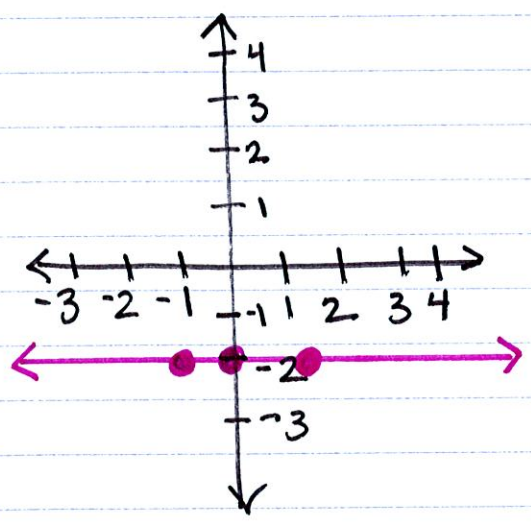


③ Connect the dots

$y = -2$

x	y
-1	-2
0	-2
1	-2

$y = 0x + -2$





# Lesson 8-6

2/9/12

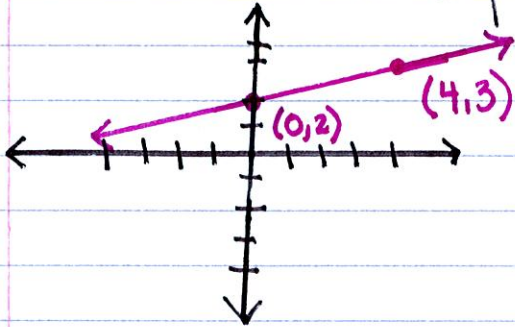
# Slope

(p427-432)

Slope: the ratio that compares the vertical change (y-axis... a.k.a. "rise") to the horizontal change (x-axis... run)

$$\frac{\Delta y}{\Delta x} = \frac{\text{rise}}{\text{run}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Find the slope of the line:

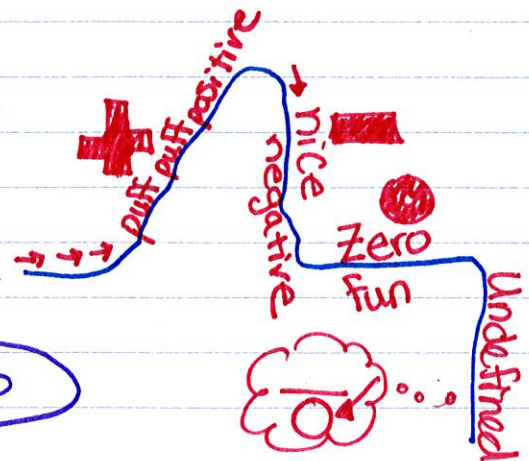


$$\frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 2}{4 - 0} = \frac{1}{4}$$

Find the slope of the line that passes through each pair of points:

$$(x_1, y_1) \quad (x_2, y_2)$$
$$(7, 2) \quad (12, 6)$$

$$\frac{6 - 2}{12 - 7} = \frac{4}{5}$$



FIVE STAR  
★★★★★

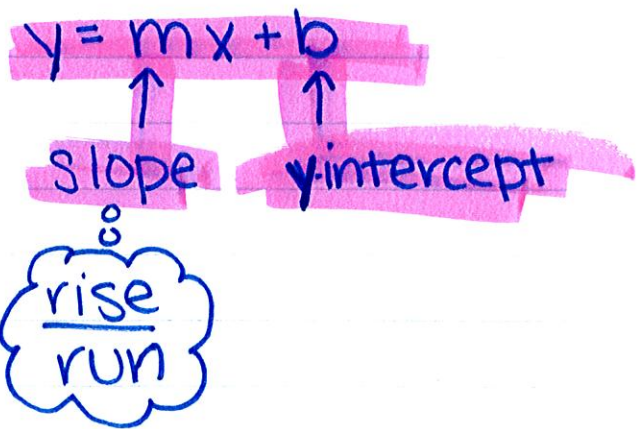
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# Lesson 8-7

1/26/11 Slope-Intercept Form (p 433-438)

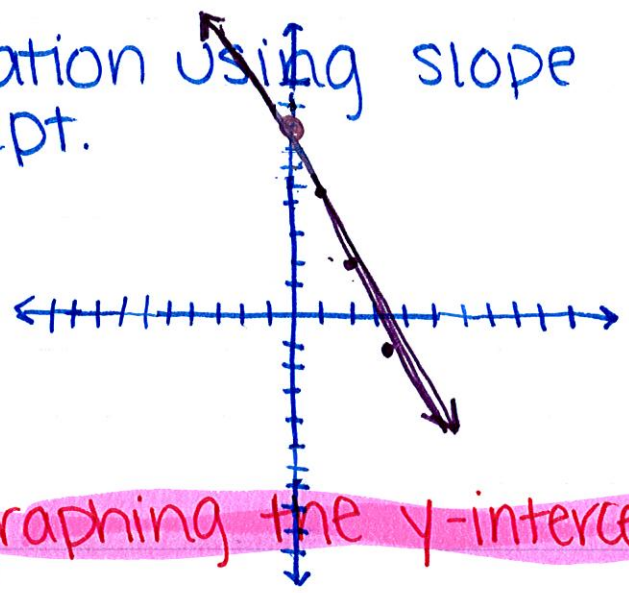
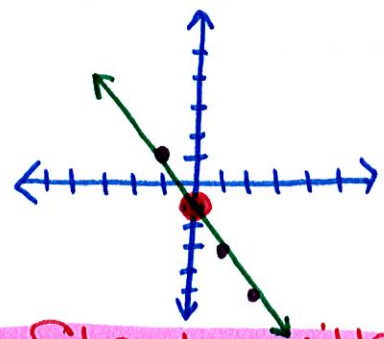


State the slope and the y-intercept of each equation.

ex:  $y = -2x - 1$   
 $m = -2$   
 $b = -1$

ex:  $3x + y = 8$   
 $\frac{-3x}{-3x} \quad \frac{-3x}{-3x}$   
 $y = -3x + 8$   
 $m = -3$   
 $b = 8$

Graph each equation using slope and y-intercept.



\* Start with graphing the y-intercept



# Lesson 8-8

## 2/4/12 Writing Linear Equations (p 441-447)

Point-Slope form: an equation in the form

$$(y - y_1) = m(x - x_1)$$

$$y = mx + b$$

Write an equation in slope-intercept form.

ex → The slope is  $\frac{1}{2}$ . The y-intercept is  $-5$

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

ex → The slope is  $2$ . The y-intercept is  $\frac{1}{3}$ .

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

Write an equation for the line that passes through  $(4, 8)$  and  $(-2, 5)$

$$\frac{5-8}{-2-4} = \frac{-3}{-6} = \frac{-1}{-2} = \frac{1}{2}$$

① Find "m" (the slope) and substitute it into the point-slope equation

$$y - y_1 = \frac{1}{2}(x - x_1)$$
  
$$y - 8 = \frac{1}{2}(x - 4)$$

② Replace the  $y_1$  and  $x_1$  in the equation with the first ordered pair



# Lesson 8-10

## Systems of Equations (p 453-457)

Systems of Equations - a collection of two or more equations with the same set of variables.

ex:  $y = 5x$

$y = 30 + 2x$

\* This is a system of equations because each equation has a  $y$  and a  $x$

The solution to the system is  $(10, 50)$  because the ordered pair is a solution of BOTH equations.

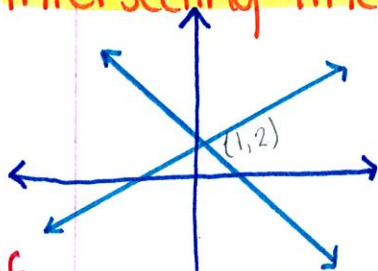
$$50 = 5(10)$$
$$50 = 50$$

$$50 = 30 + 2(10)$$
$$50 = 30 + 20$$
$$50 = 50$$

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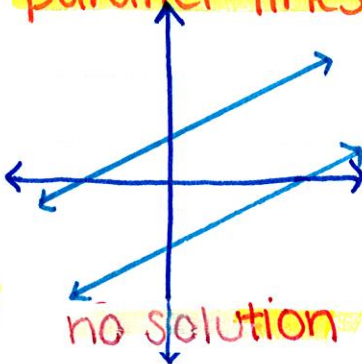
When graphing systems of equations, 3 possible graphs:

intersecting lines



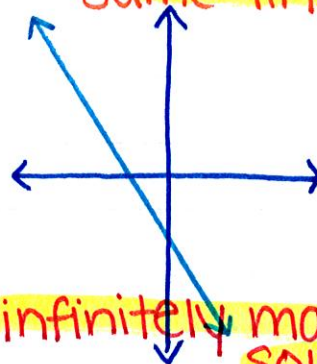
one solution

parallel lines



no solution

same line



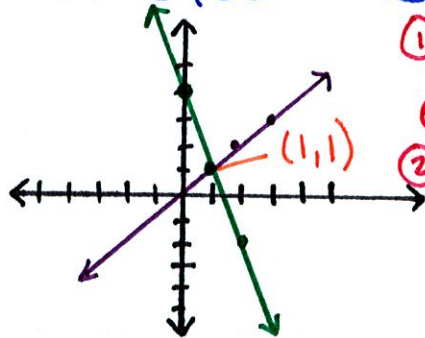
infinitely many solutions

# of solutions:

Solve this system of equations by graphing.

example 1:  $y = x$   
 $y = -3x + 4$

Answer:  $(1, 1)$

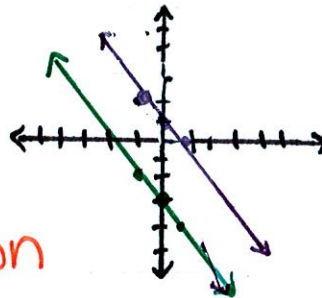


- ① Graph each equation
- ② Determine if the system intersects, is parallel, or coincides

\* if it intersects, give the ordered pair for the solution.

example 2:  $y = -x + 1$   
 $y = -x - 3$

Answer: no solution



example 3:  $y = 2x + 4$

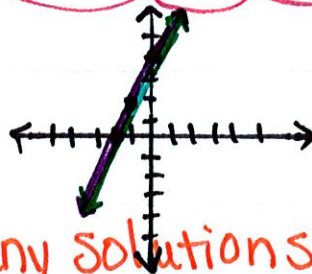
$$\frac{1}{2}y - x = 2 \quad \text{or}$$

$$\begin{array}{r} \frac{1}{2}y - x = 2 \\ +x \quad +x \\ \hline \end{array}$$

$$2\left(\frac{1}{2}y = x + 2\right)$$

$$y = 2x + 4$$

Don't forget to make sure the equation is solved for y!



Answer: infinitely many solutions

Solve the system of equations by substitution.

$$y = x + 2$$
$$y = 5$$

① substitute  $y = 5$  into the first equation to solve for  $x$

② write the  $(x, y)$  as the solution.


$$y = x + 2$$
$$5 = x + 2$$
$$\begin{array}{r} -2 \quad -2 \\ \hline 3 = x \end{array}$$

Answer:  $(3, 5)$




2/23


## Lesson 8-10 Supp.

Reminder


infinitely many  
consistent  
dependent



one solution  
consistent  
independent



No solution  
inconsistent

Substitution\* Solve 1 equation for 1 variable\* Substitute what you solve for into the other equation

Ex: 1

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

$$\textcircled{x} + 3y = 3$$

$$2(-3y + 3) + 5y = -5$$

$$-6y + 6 + 5y = -5$$

$$-y + 6 = -5$$

$$-y = -11$$

$$y = 11$$

$$x = -3y + 3$$

$$x = -3(11) + 3$$

$$x = -33 + 3$$

$$x = -30$$

$$\boxed{(-30, 11)}$$

Ex: 1b  $x - 2y = 4$   
 $3x - 6y = 8$   
No sol.

Hint: if the variables disappear: No Solution or infinitely many sol.

Elimination\* Goal is to have both x's or y's with the same coefficient + or -\* Multiply 1 or both equations by a constant \* Add together

Ex: 2

$$3x - 7y = 10$$

$$-3x + 4y = -4$$

$$\frac{-3y}{-3} = \frac{6}{-3}$$

$$\boxed{y = -2}$$

$$(6x - 8y = 8) \div 2$$

$$6x - 8(-2) = 8$$

$$6x + 16 = 8$$

$$6x = -8$$

$$\boxed{x = -\frac{4}{3} \text{ or } -1\frac{1}{3}}$$

$$\boxed{(-1\frac{1}{3}, -2)}$$

Ex: 2b  $4x - 10y = 8$   
 $-14x + 35y = -28$   
infinitely many sol