Name_____

Day	Date	Assignment (Due the next class meeting)
		2. 1 Worksheet
		2.2 Worksheet
		2.3 Worksheet
		2.4: Worksheet
		Ch 2 Practice Test Study!
		In class: **Ch 2 Test** HW: none ☺

NOTE: Be prepared for daily quizzes.

Students with 100% homework completion AND no late/missing homework for the semester will be rewarded with a pizza party. Students with 100% homework completion and no missing homework for the semester will get a 2% grade increase.

Do you need a worksheet or a copy of the teacher notes?
# Go to www.washoeschools.net/DRHSmath

1. *Online textbook information:* Go to www.washoeschools.net
   - Click on Student and Parent
   - Click on Envision
   - Click on Sign In – sign in using washoe\studentID#, and then your school computer password. (Note: use a back slash not a forward slash.)

2.1 Notes: Slope-Intercept Form

Learning Objectives

- **Graph an equation from y = mx + b form**

Exploration: Alani wants to buy a $360 bicycle. She is considering two payment options. The image shows Option A, which consists of making an initial down payment of $70 and then 5 smaller, equal-sized weekly payments until she has paid a total of $360. Option B consists of making 6 equal payments over 6 weeks in order to pay a total of $360.
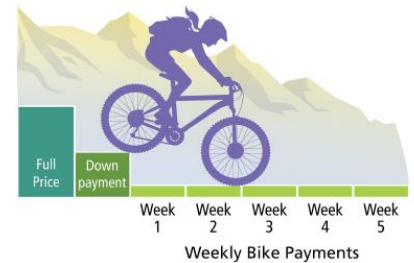
A) What factors should Alani take into consideration before deciding which option to choose?

B) How much would Alani have to pay for each weekly payment with option A? Write an equation to model the amount paid A after m months.
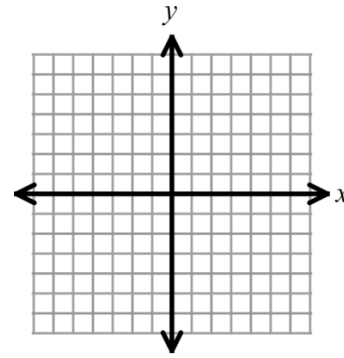
Key Vocabulary

       Slope of a line y-**intercept of a line**

       Slope-Intercept Form

Example 1: Find the slope and *y*-intercept of the line $y = -\frac{4}{5}x + 2$.
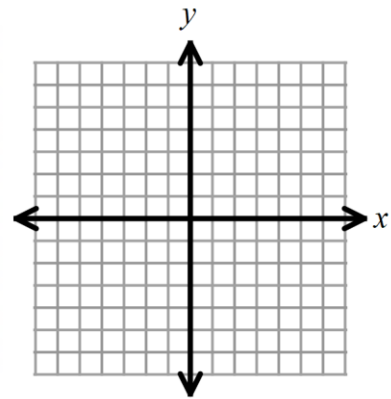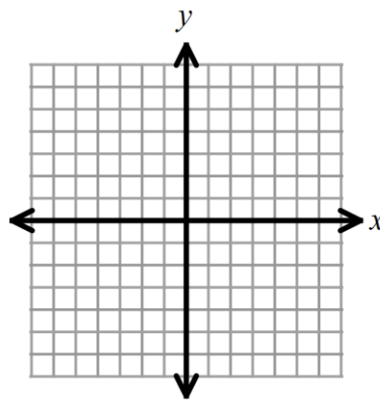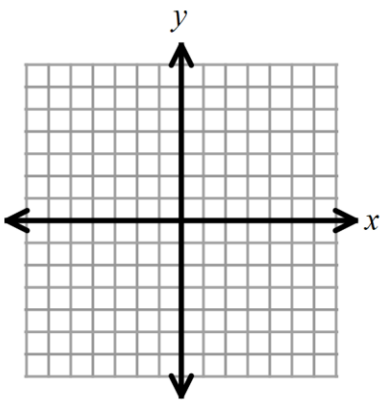Then graph the line on the coordinate system provided.

You try! Example 2: Find the slope and *y*-intercept of each line below. Then graph each line.
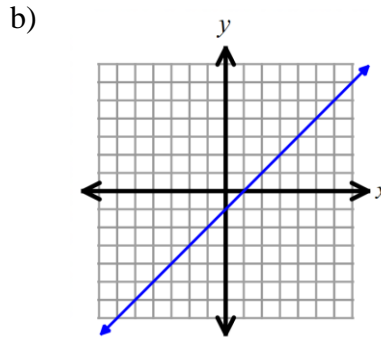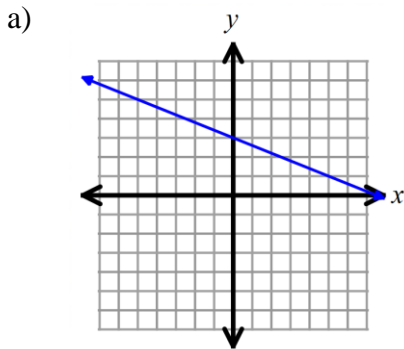
a) $y = 3x + 1$ b) $y = -4x$ c) $y = x - 5$
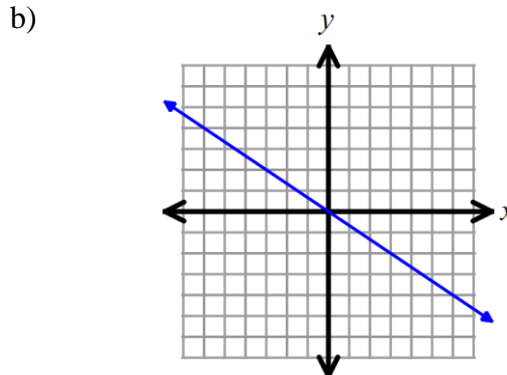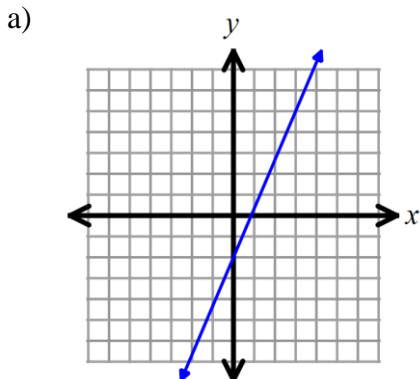
Example 3: Write the equation, in slope-intercept form, of each line graphed below.
a)   b)

You try! Example 4: Write the equation, in slope-intercept form, of each line graphed below.
a)   b)

Connection: How can you tell by looking at the graph of a line if the slope should be positive or negative?

The Slope Formula: **(Use to find the slope of a line, given 2 points.)**

Example 5a: Find the slope of the line that passes through the points (-7, 2) and (0, -4).

5b: Find the *y*-intercept of the line that passes through those same points.

5c: Write the equation, in slope-intercept form, of the line that passes through those points.

Example 6: Write the equation, in slope-intercept form, of the line that passes through (-3, 1) and (-6, 2).

> If you are **not** given the ordered pair for the *y*-intercept, then you can find the value of b by using $y = mx + b$.
>
> 1) Find the slope with the slope formula.
>
> 2) Use $y = mx + b$. Plug in the value for m from step 1. Choose one given point, and use those values for x and y.
>
> 3) Solve for b.

You try! Example 7: Write the equation, in slope-intercept form, of the line passing through *one* set of points listed below. Option A is the easiest choice, and Option C is the most challenging one. Choose the one that you are the most ready to attempt.

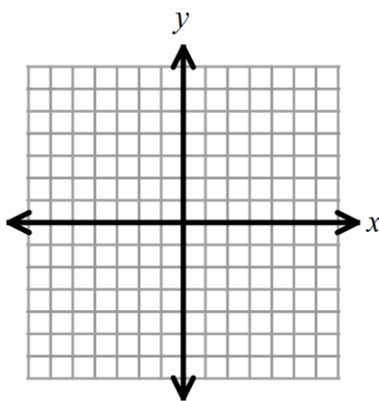A) (5, 3) and (0, 11)   B) (3.2, 7) and (4.8, -9)   C) (5, -2) and (-6, -8)

Example 8: Change the following equations into **slope-intercept form** $(y = mx + b)$. Then identify the slope and y −intercept.

a) $3x - y = 10$ b) $2x + 8y = -11$

Example 9: Graph $y = \frac{3}{4}x + \frac{1}{2}$.

CONCEPT SUMMARY Slope-Intercept Form of a Linear Equation

WORDS The slope-intercept form of a linear equation is used when the slope and the y-intercept of a line are known.

ALGEBRA The slope-intercept form of a line is $y = mx + b$.

slope   y-intercept

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

GRAPH

The line has a slope of $\frac{2}{3}$.
The y-intercept is 1.

The line has a slope of −2.
The y-intercept is −1.

2.2 Notes: (h, k) Form of a Line

Learning Objectives
- **Given two points calculate the slope and find the equation (in slope-intercept)**
- **Write and equation in (h,k) form given a point and slope**

Exploration #1: Allie received a gift card for her local coffee shop. Every time she goes to the shop, she gets a medium coffee. The graph shows her gift card balance after buying 2 coffees and 4 coffees.

Part A: Find the rate of change (slope) for the line that contains the two points shown. What does this represent in this problem?
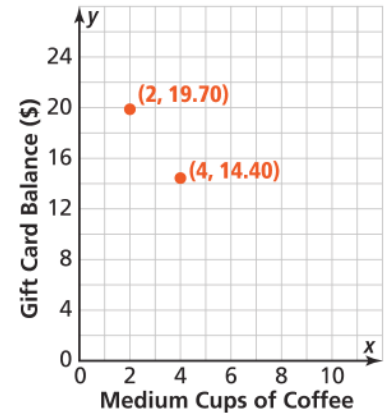
Part B: Find the *y*-intercept for the line containing these points. What does that represent in this problem?

Part C: Use your results from Parts A and B to write the equation of the line (in slope-intercept form) that passes through these points.

(h, k) **Equation of a Line:**

Example 1a: Write the equation of the line, **in (h, k) form**, that passes through (5, -2) with a slope of -3.

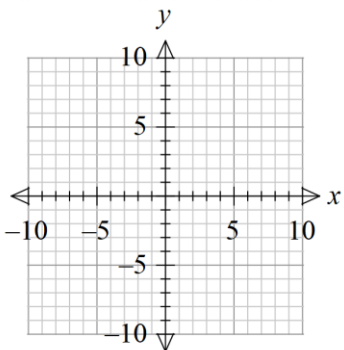**1b:** Write the equation of the line from Example 1a in **slope-intercept form** of a line.

You try! Example 2: For each line described below, write the equation in (h, k) **form.** Then, convert the equation to **slope-intercept form** by using the distributive property and solving for *y*.

a) through (-3, 1) with a slope of 2   b) through (4, 6) with a slope of $\frac{3}{4}$.

	a)	b)
(h, k) **form**		
slope-intercept form (distribute and solve for *y*)		

Exploration #2. Consider the linear function that passes through the points (6, -2) and (9, -8).

Part A: Plot the two points, and draw the linear function that passes through them.	Part B. Find the rate of change (or "slope") for this linear function. Either show mathematical work, or describe how you found your solution.
Part C. Use the rate of change that you found in Part B and the graph from part A in order to find the *y*-intercept of the function.	Part D. Write the equation of the line in slope-intercept form.
Part E. Using the point (6, -2) and the slope you found in Part B, write the equation of the linear function in (h, k) form.	Part F. Using the point (9, -8) and the slope you found in Part B, write the equation of the linear function in (h, k) form.
Part G. Convert the linear function you wrote in Part E to slope intercept form. What do you notice when you compare your answer to Part D?	Part H. Convert the linear function you wrote in Part F to slope intercept form. What do you notice when you compare your answer to Parts D and G?

Function Notation for an ordered pair:

Example 3: Write the equation of the line, in (h, k) form, that contains $f(-11) = -2$ and has a slope of 2.

You try! Example 4: Write the equation of the line, in (h, k) form, that contains $f(14) = -5$ and has a slope of $-\frac{1}{2}$.

Using (h, k) form to write the equation of a line (in slope-intercept form) that passes through two points:

Example 5: Write the equation of the line that passes through (5, -3) and $(1, -4)$. Write your final answer in slope-intercept form.

You Try! Example 6: Write the equation of the line, in slope-intercept form, that passes through the given points.

a) (6, 2) and (8, 10)

b) $f(-1) = 9$ and $f(-3) = 4.$

For Examples 7 – 9: The table shows the price that a customer pays for a certain amount of invitations ordered. Each price includes a price per invitation as well as a one-time set-up fee.

7) Write the equation of the line, in slope-intercept form, that represents the price based on the number of invitations purchased.

# of invitations x	Price (in dollars) $f(x)$
25	100
50	140
75	180
100	220

8) What is the price per invitation?

9) What is the cost of the one-time set-up fee?

You Try! Example 10: Write the equation, in slope-intercept form, that represents the linear data shown in each table below.

a)

x	$f(x)$
15	100
20	115
25	130
30	145

b)

x	y
-4	-18
-2	-21
2	-27
4	-30

Example 11: Which of the following equations correctly model the linear function shown? Choose all that apply.

A) $y = -\frac{7}{2}(x + 2) + 1$

B) $y = \frac{7}{2}(x - 1) + 2$

C) $y = -\frac{7}{2}(x - 4) - 6$

D) $y = \frac{7}{2}(x + 6) - 4$

E) $y = -\frac{7}{2}(x - 2) + 1$

F) $y = -\frac{7}{2}x + 8$
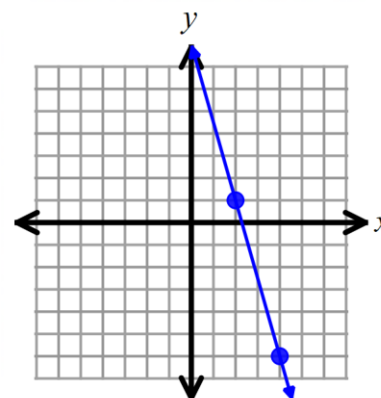
2.3 Notes: Standard Form
Learning Objectives
- **Given an equation in Ax + By = C calculate the x- and y-intercepts and use them to graph the line.**
- **Create an equation in Ax + By = C form from a word problem.**

Warm-up: For #1 – 3, use $y = 3x - 6$.

1) Graph the line.
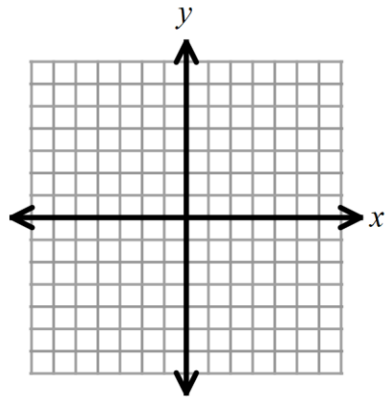
2) What is the *y*-intercept of the line?

3) At what *x*-value does the line cross the *x*-axis?

Key Vocabulary
Standard Form of a Line

	x −intercepts	y −intercepts
Definition:		
To find:		

Example 1: Find the *x*- and *y*-intercepts of the graph of each equation:
a) $4x + 3y = 24$
b) $x - 2y = -70$

You Try! Example 2: Find the x- and y-intercepts of the graph of each equation:
a) $-5x + 3y = 15$ b) $8x - 4y = 16$

Example 3: Graph each line by using x- and y-intercepts.
a) $x + 4y = 8$ b) $3x - 4y = -12$
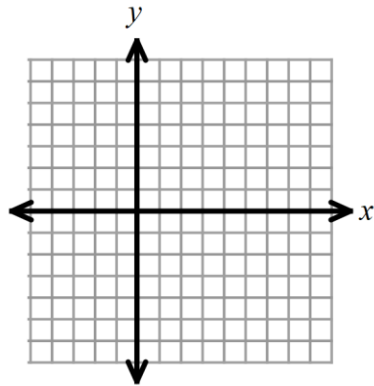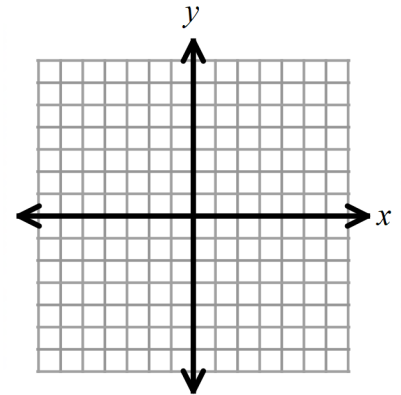
Note: try 3a) again by converting to slope-
intercept form. Is the graph the same?

You try for parts c) and d)! Also, convert the equations to slope-intercept form in order to check your graphs.
c) $-10x - 30y = 30$ d) $6x - y = -12$
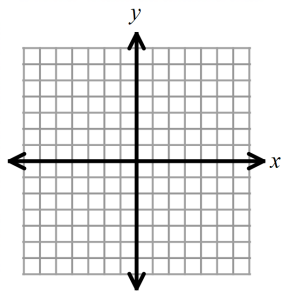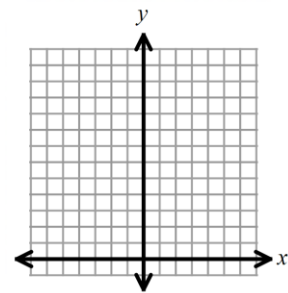
Equations of Special Lines:
Horizontal Line: **Vertical Line:**

Example 4: Write the equation of each special line described.

a) The horizontal line passing through (-3, 2).

b) The vertical line passing through (-3, 2).

You try parts c) and d)!
c) The vertical line passing through (5, -10).

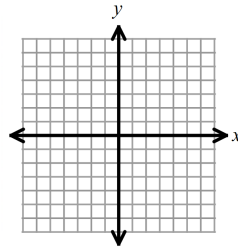d) The horizontal line passing through (5, -10).
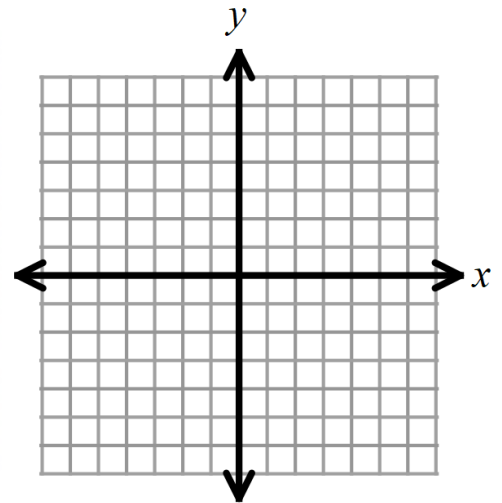
Example 5: Sketch the graph of each equation. Notice that each is a special line.
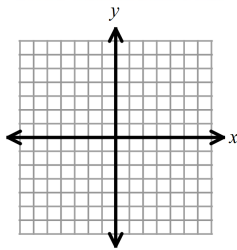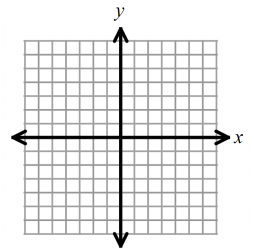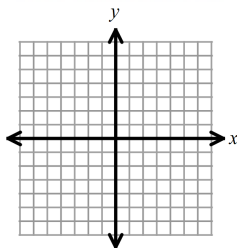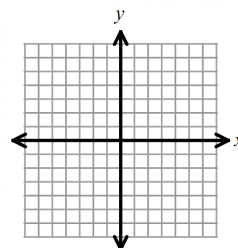
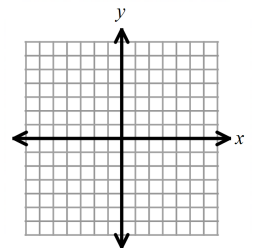a) $y = 2$ b) $-3x = -12$ c) $-y = 4$

You try!

c) $x = -5$ d) $-3y = -15$ e) $7x = 14$

Writing the equation of a line in Standard Form:

$Ax + By = C$ where $A, B,$ and C are integers and A is positive.

Example 6: Write each line in standard form. $Ax + By = C$ where $A, B,$ and C are integers and A is positive.

a) $y = 2x + 5$ b) $y = -\frac{5}{3}x + 6$ *Hint:* Start by clearing the fraction!

You try for parts c) and d)!

c) $y = -7x - 19$

d) $y = 4x - \frac{1}{8}$

Example 7: Paxton runs a summer camp, and he has budgeted $300 to spend on shirts and hats. The shirts cost $20.00 each, and the hats cost $12.00 each.

a) Write an equation that can model the situation if he buys x shirts and y hats.

b) How many hats can he get if he only buys hats?

d) How many shirts can he buy if he only purchases shirts?
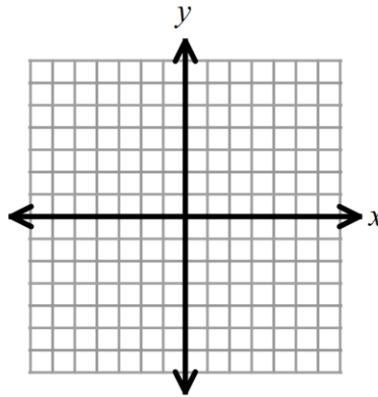
2.4 Notes: Parallel and Perpendicular Lines
Learning Objectives
- **Identify two lines as parallel, perpendicular or neither from slope-intercept (and standard) form.**

Warm-up:
1) Find the slope between the two points: (-3, -11) and (7, 5)

2) Graph the line: $5x - 3y = -15$

Parallel Lines

Perpendicular Lines

Example 1: For each line, identify its slope. Then find the slope of a line parallel to that line, and the slope of a line perpendicular to the given line.

Lines	Slope	Parallel Slope	Perpendicular Slope
$y = -3x + 5$			
$y = \dfrac{2}{9}x - 1$			
$y = x - 11$			
$3x - 5y = 7$			
$2x + 6y = 14$			
$x = -3$			
$y = 7$			

Examples 2 – 6: Are the graphs of each pair of lines parallel, perpendicular, or neither?

2) $y = 3x + 6; \; 2y = -6x - 18$

3) $x = -3; x = -2$

4) $5x - 2y = 7; \; y = -\dfrac{2}{5}x + 3$

You try for #5 – 6!

5) $y = 4x - 9; \; 4y = 16x + 7$
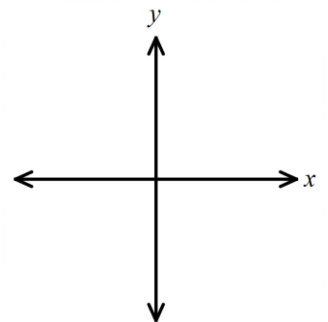
6) $x = -18; y = 24$

Writing Equations of Parallel and Perpendicular Lines

Examples 7 – 10: Write the equation of the line that passes through the given point and is parallel to the given line. Write your answer in **slope-intercept form**, unless it is a special line.
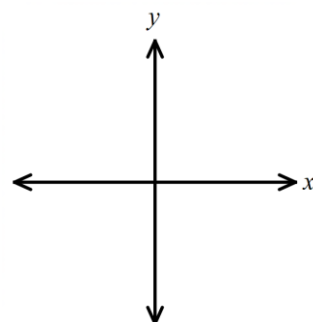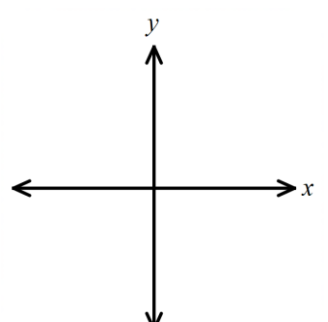
7) $(-4, 9); y = -\frac{3}{4}x + 1$
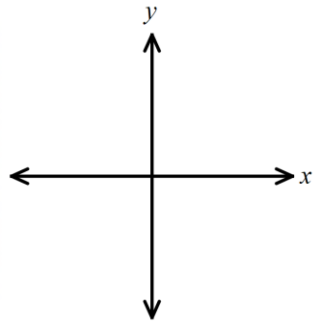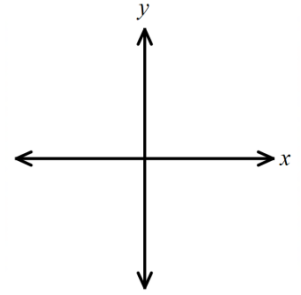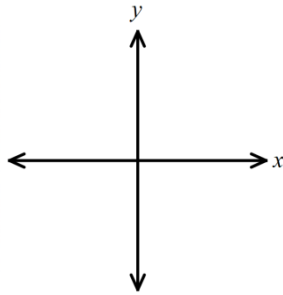
8) $(5, -2); 3x - y = 12$

9) $(-2, 8); y = 15$

10) $(17, 5); x = -1$

You Try! Examples 11 – 12: Write the equation of the line that passes through the given point and is parallel to the given line. Write your answer in (h, k) **form**, unless it is a special line.

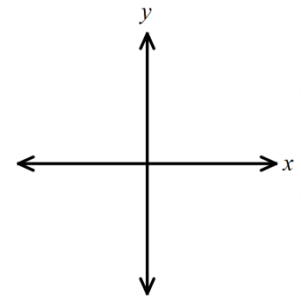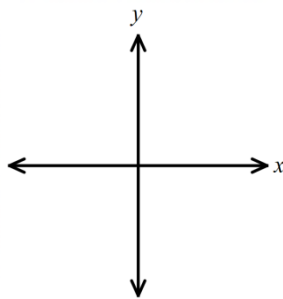11) $(-6, 1); 2x + 3y = 4$ 12) $(-41, 2); x = 15$

Examples 13 – 16: Write the equation of the line that passes through the given point and is perpendicular to the given line. Write your answer in slope-intercept form, unless it is a special line.

13) $(4, 7); y = -2x + 5$ 14) $(21, -9); 3x - 7y = 10$

15) $(-7, -2); y = 1$ 16) $(-25, 8); x = 0$