Geometry Lomac 2015-2016	Date 10/21 due 10/22	Linear Equations slope intercept form day 2	3.6L

Name _____ **Per**_____

LO: I can rearrange an equation into y = mx + b form to identify the slope and y-intercept. I can write an equation for a line when given a graph, two points, or a point and the slope of a line.

☐ **DO NOW** On the back of this packet

☐ (1) **Need to know: Slope-Intercept form of a linear function**

One skill that we need to become **fluent** at in Algebra I is creating the equation of a linear function. We will concentrate on learning how to form equations in the **slope-intercept form** that we have been working with.

THE SLOPE-INTERCEPT FORM OF A LINEAR FUNCTION

Given a linear function, $f(x)$, it can be expressed in equation form by:

$$f(x) = y = mx + b$$

where the two **parameters** are m = average rate of change = slope = $\frac{\Delta y}{\Delta x}$ and b = y-intercept of the line

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☐ (2) **Linear Functions: Determining the slope and y-intercept from equations and graphs**

Rewrite each of the following linear equations in equivalent $y = mx + b$ (slope-intercept) form. Identify the slope and the y-intercept and then graph on the grid given. Label each line with its original equation.

(a) $2y - 3x = 10$

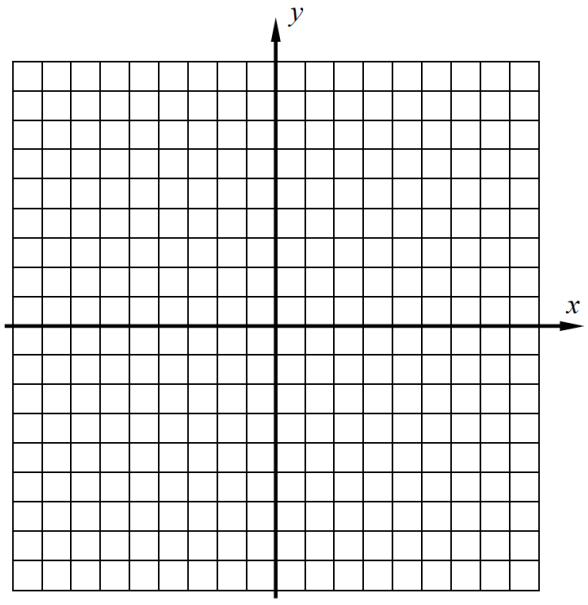
Slope: _____ y-intercept: _____

(b) $x + 2y = 6$

Slope: _____ y-intercept: _____

(c) $3y + 12 = 5x$

Slope: _____ y-intercept: _____

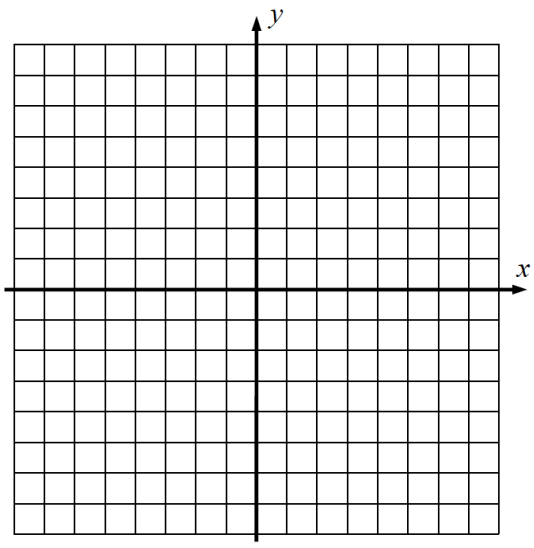


☐ (3) **Using slope and y-intercept to graph**

What are the coordinates of the one point shared in common between the two linear functions given below?

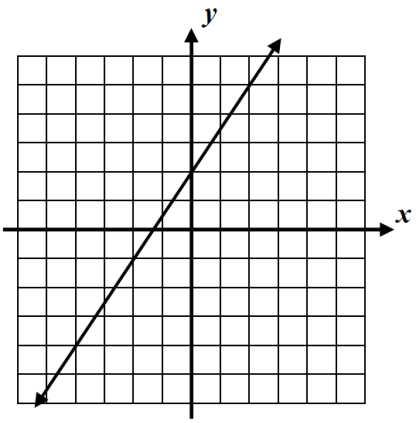
$y = 2x - 2$

$3y + x = 15$



☐ (4) **Using slope and y-intercept to write an equation OR . . . using slope and a point on the line**

***Exercise* #1:** Consider the linear function whose graph is shown below.

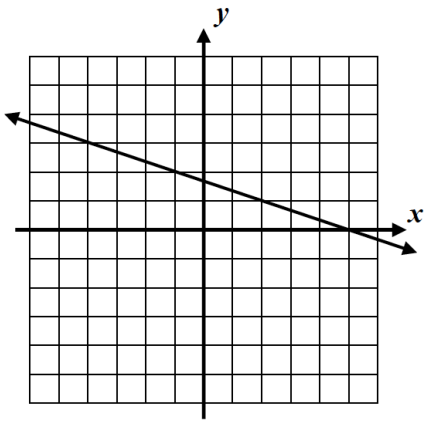


(a) Determine an equation in the form $y = mx + b$ for this line.

(b) Test your equation for the value $x = 2$.

When the y-intercept is an **integer**, such as in the last exercise, it is fairly easy to get the **exact relationship** between x and y. Let's try another graphical problem where the y-intercept is not an **integer.**

***Exercise* #2:** Find the equation of the linear function shown in slope-intercept form. Test your equation for $x = -4$.



☐ (5) **Using two points on a line to determine the slope and, afterward, the y-intercept to write an equation**

We need to also be able to find the equation for a linear function if we know two points that lie on it. Notice that this means we have to determine the value of the **two parameters** with two pieces of information.

***Exercise* #3:** Find the equation of the line that passes through each of the following pairs of points in $y = mx + b$ form.

(a) $(2, 5)$ and $(5, 17)$

(b) $(-2, 5)$ and $(2, 3)$

(c) $(-1, 11)$ and $(4, -4)$

☐ (6) **Interpreting word problems to find two points and write an equation**

***Exercise* #4:** A car is traveling along a straight road. After one hour, the car is 72 miles from Chicago. After three hours, the car is 188 miles from Chicago. Determine an equation for the distance, *d*, the car is from Chicago after *h*-hours if the relationship between *d* and *h* is linear.

☐ (7) **Exit Ticket**

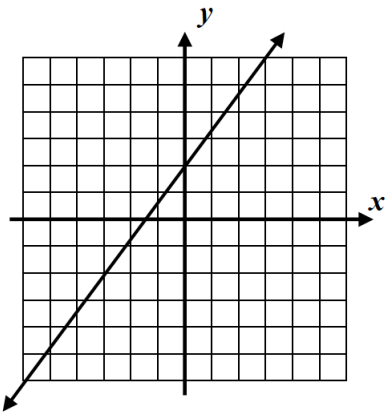
ON THE LAST PAGE

☐ (8) **Homework**

FLUENCY

1. Each of the following lines has a slope and y-intercept that can be determined by examining the graph. For each, state the slope, the y-intercept, and then write the equation in $y = mx + b$ form (slope-intercept form).

(a)



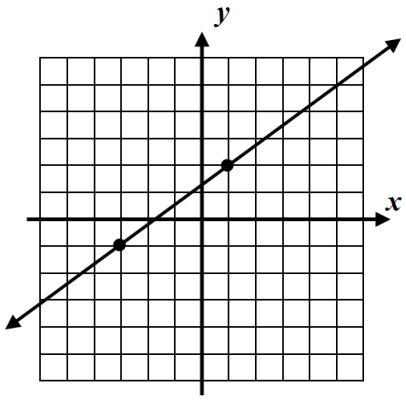
Slope: _____

y-intercept: _____

Equation: _____

2. Each of the following lines has a slope that can be determined by examining the graph. Use another point on the line to solve for the exact y-intercept. Then, state the equation of the line.

(a)

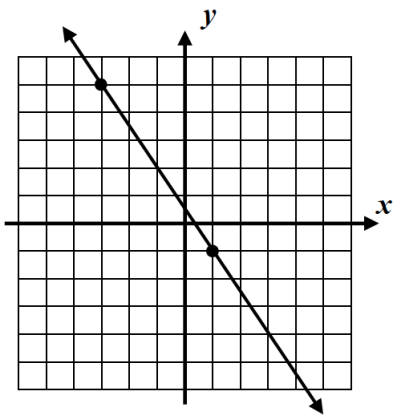


Slope: _____

Solve for y-intercept:

Equation: _____

(b)



Slope: _____

Solve for the y-intercept:

Equation: _____

☐ (8) **Homework**
cont.

(3)

***Exercise* #5:** Rearrange each of the following linear equations into $y = mx + b$ form and identify the slope and the y-intercept.

(a) $3y - 3x = 15$

(b) $2y + 5x = -8$

(c) $x - 3y = 6$

(d) $6x - 4y = -20$

(4)

A steady snow fall is coming down outside. Prestel decides to measure the depth of the snow on the ground. After 4 hours, the snow is at a depth of 9 inches an after 8 hours it is at a depth of 14 inches.

(a) Express the information given in this problem as two coordinate pairs, (h, d), where h is the number of hours and d is the depth of snow.

(b) Find the slope of the line that passes through these two points. What are its units?

(c) Find the equation of the line that passes through the two points in $d = mh + b$ form.

(d) What was the depth when the snowfall began ($h = 0$)? What would the depth be after 12 hours?

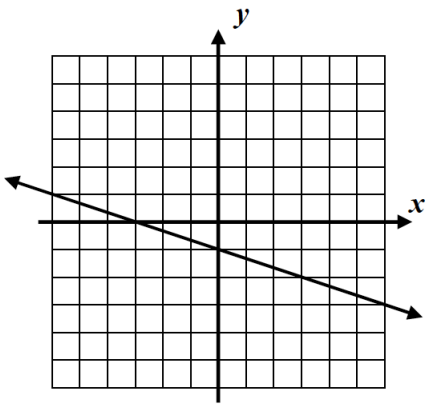
Exit Ticket **Name**_____ **Date** _____ _____ **Per**_ _____ **3.6L**

(1) The LO (Learning Outcomes) are written below your name on the front of this packet. Demonstrate your achievement of these outcomes by doing the following:

(a) Find the equation of the line that passes through the following pair of points in $y = mx + b$ form.

$(3, 4)$ and $(12, 19)$

(b) Use the graph to state the slope and the y-intercept and then write an equation in y = mx + b form (slope-intercept form).



Slope: _____

y-intercept: _____

Equation: _____

DO NOW **Name**_____ **Date** _____ **Per**_____ **3.6L**

(1) Solving progress: Solve one of the two problems below.

(a) $-32 = -3 + 7x + 3(x - 2)$

(b) $-7x + 11 = 19 - x$

(2) Translation to algebra progress. Write an algebraic statement to represent this situation. Be sure to write a "Let" statement to define any variables.

Alison has a piece of board 70 inches long. She cuts it into three pieces. The longest piece is twice the length of the middle-sized piece, and the shortest piece is 10 inches shorter than the middle-sized piece. Find the length of the longest piece.