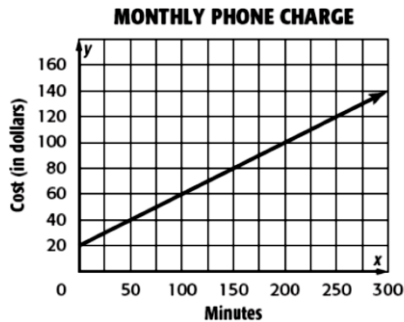


Algebra U7L6 - Horizontal and Vertical Lines

Warm Up...

A.3C – real world linear functions:

The graph below represents the amount Samira pays for her cell phone service: a monthly fee plus a charge for each minute she uses her phone.



What does the y-intercept indicate?

- A. Her monthly fee is \$0.
- B. Her rate per minute is \$0.40.
- C. Her monthly fee is \$20.
- D. Her rate per minute is \$0.20.

A.2C – write equation from table or graph:

Write an equation for the situation represented in the table at the bottom of this box

Recent Review:

Write the slope-intercept form of the equation of the line through (3, 4) and perpendicular to $y = -2x - 4$

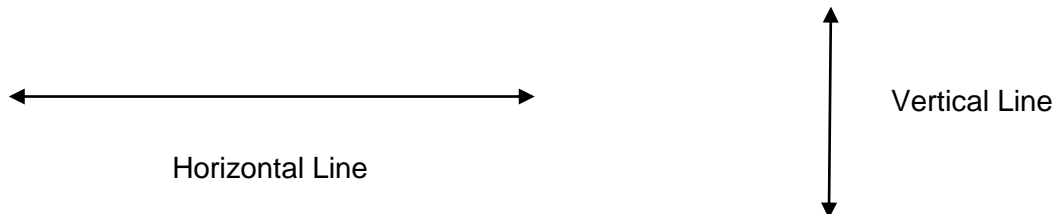
Dionne's Boat Rental					
Hours Rented	1	2	3	4	5
Amount Paid	\$27	\$39	\$51	\$63	\$75

Today's Goal:

- KWBAT write an equation of a line that is parallel to the x or y axis and determine whether the slope of the line is zero or undefined
- WHY? This is Algebra standard A.2G. We have become really awesome with most linear equations, but I've noticed that horizontal and vertical lines still sometimes make us nervous. Let's get those sorted out today so we can be calm and confident!

What do I need to know?

There are two types of lines that are slightly different from the typical slanted line. These lines are horizontal (parallel to the x-axis) and vertical (parallel to the y-axis)



Exercise #1: The line $y = 3$ is graphed on the grid at the right.

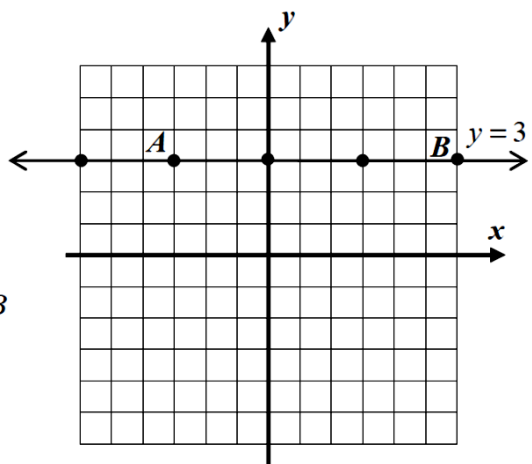
(a) Graph and label the lines $y = 5$ and $y = -2$ on the same grid.

(b) State the coordinates of point A and B from the line $y = 3$.

(c) If it exists, find the slope of the line connecting points A and B from above.

(d) If it exists, find the y -intercept of the line connecting points A and B .

(d) Write the equation of the line connecting A and B in $y = mx + b$ form.



EQUATIONS OF HORIZONTAL LINES

$$y = mx + b \text{ where } m = 0 \text{ (or simply } y = b)$$

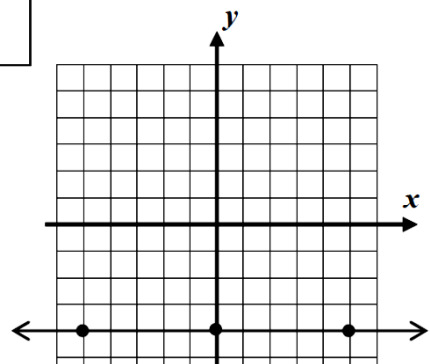
Exercise #2: Which of the following represents the equation of the graph shown at the right?

(1) $x = -4$

(3) $y = -4x$

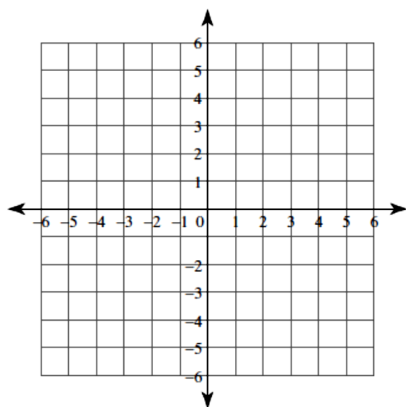
(2) $y = x - 4$

(4) $y = -4$

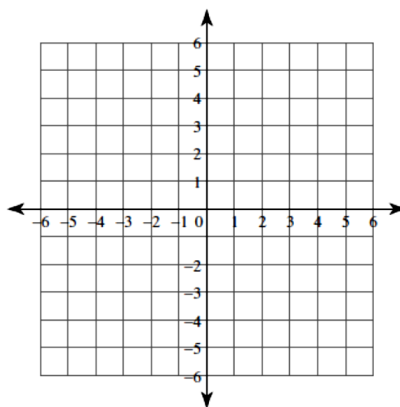


Sketch the graph of each line.

1) $y = -1$



2) $y = -4$



What is the slope? _____

What is the slope? _____

Exercise #3: The line $x = 2$ is graphed on the grid at the right.

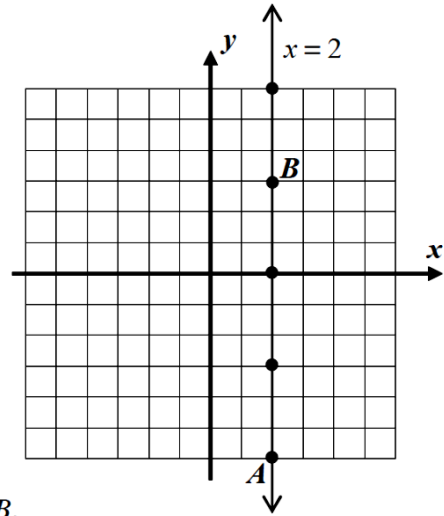
(a) Graph and label the lines $x = 4$ and $x = -3$ on the same grid.

(b) State the coordinates of point A and B from the line $x = 2$.

(c) If it exists, find the slope of the line connecting points A and B from above.

(d) If it exists, find the y -intercept of the line connecting points A and B .

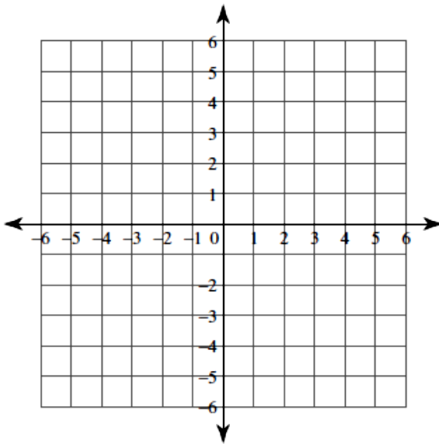
(e) Why is it not possible to write the equation of a vertical line in $y = mx + b$ form?



EQUATIONS OF VERTICAL LINES

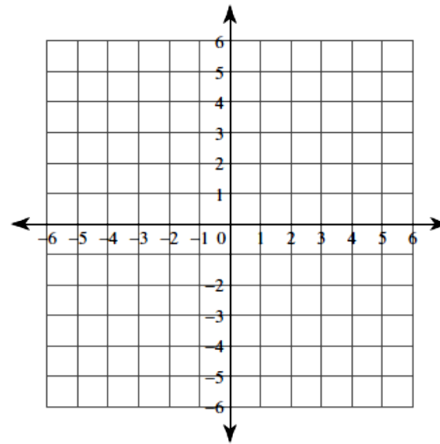
$x = a$ where a is the x -intercept of the line

3) $x = -3$



What is the slope? _____

4) $x = -1$



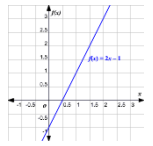
What is the slope? _____

Exercise #5 Create a rough sketch and then write the equation of the line that fits each description:

(a) parallel to the x -axis passing through $(3, 2)$

(b) parallel to the y -axis passing through $(-4, 3)$

Name _____ Date: _____ Pd: _____

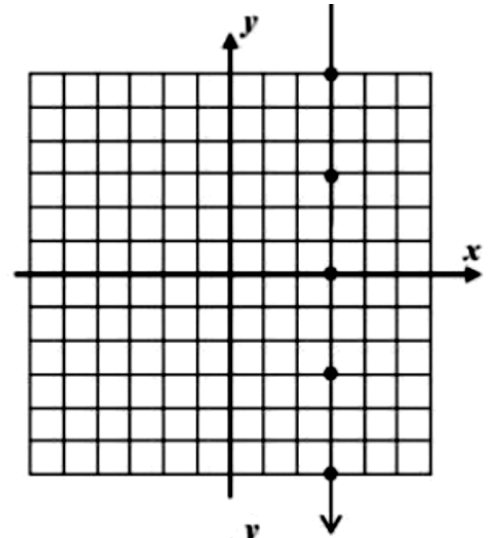


EXIT TICKET - Algebra U7L6 - Horizontal and Vertical Lines

1. Which of the following equations represents the line shown in the graph to the right?

- (1) $y = 3$
- (2) $x = 3$
- (3) $y = 3x$
- (4) $x = 3y$

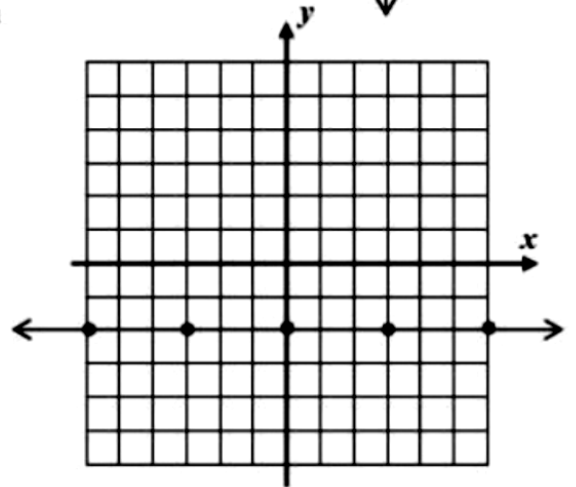
1b) What is the Slope: _____



2. Which of the following equations represents the line shown in the graph to the right?

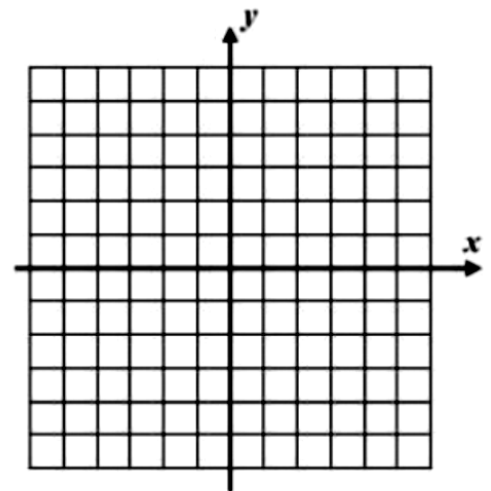
- (1) $y = -2$
- (2) $y = -2x$
- (3) $x = -2$
- (4) $y = x - 2$

2b) What is the slope: _____



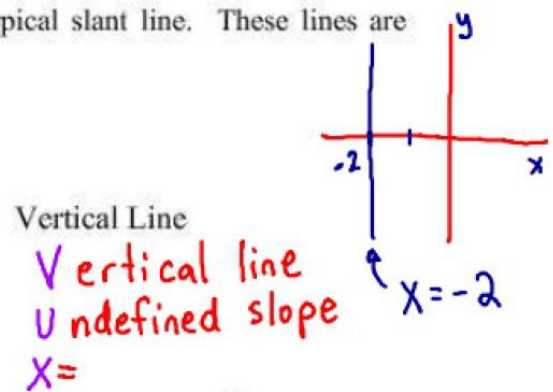
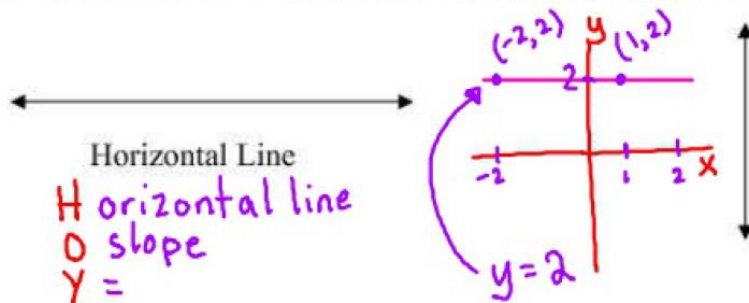
3. Graph and **label** the following two lines. Write the coordinates of their intersection point.

$x = -5$ $y = 4$



Horizontal and Vertical Lines Algebra 1

There are two types of lines that are slightly different from the typical slant line. These lines are horizontal, parallel to the x -axis, and vertical, parallel to the y -axis.



Exercise #1: The line $y = 3$ is graphed on the grid at the right.

(a) Graph and label the lines $y = 5$ and $y = -2$ on the same grid.

(b) State the coordinates of point A and B from the line $y = 3$.

$A(-3, 3)$ & $B(6, 3)$

(c) If it exists, find the slope of the line connecting points A and B from above.

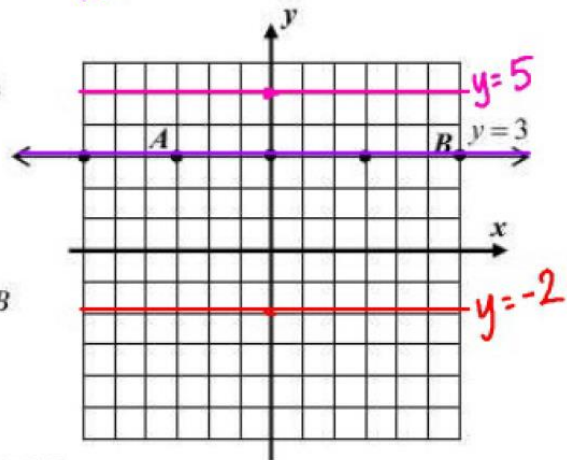
$m = 0$

(d) If it exists, find the y -intercept of the line connecting points A and B .

$(0, 3)$

(e) Write the equation of the line connecting A and B in $y = mx + b$ form.

$y = 0 \cdot x + 3 \rightarrow y = 3$



EQUATIONS OF HORIZONTAL LINES

$y = mx + b$ where $m = 0$ (or simply $y = b$)

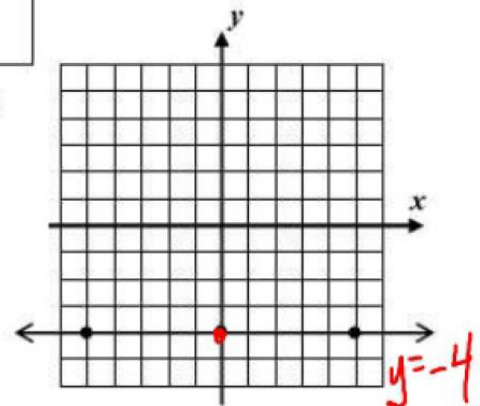
Exercise #2: Which of the following represents the equation of the graph shown at the right?

(1) $x = -4$

(3) $y = -4x$

(2) $y = x - 4$

(4) $y = -4$



Exercise #3: The line $x = 2$ is graphed on the grid at the right.

(a) Graph and label the lines $x = 4$ and $x = -3$ on the same grid.

(b) State the coordinates of point A and B from the line $x = 2$.

$$A(2, -6) \text{ \& } B(2, 3)$$

(c) If it exists, find the slope of the line connecting points A and B from above.

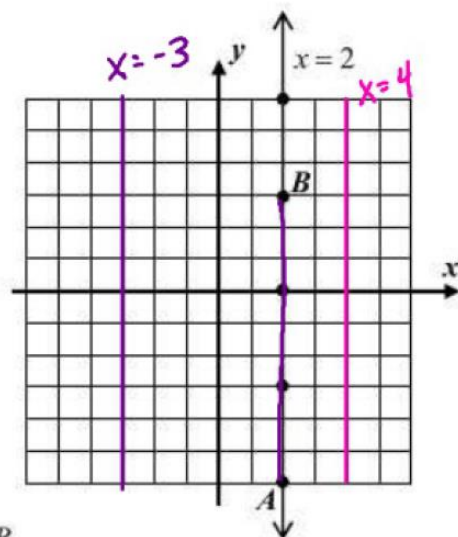
$$m = \frac{\text{rise}}{\text{run}} = \frac{9}{0} = \text{UNO}$$

(d) If it exists, find the y -intercept of the line connecting points A and B .

there is none

(e) Why is it not possible to write the equation of a vertical line in $y = mx + b$ form?

slope is undefined
and/or
it will never touch
the y -axis



EQUATIONS OF VERTICAL LINES

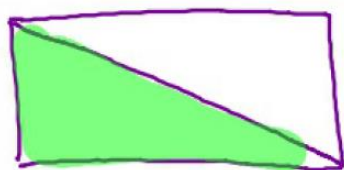
$x = a$ where a is the x -intercept of the line

Exercise #4 Graph the following three lines and find the area of the triangle enclosed by them.

$$x = 5$$

$$y = -3$$

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

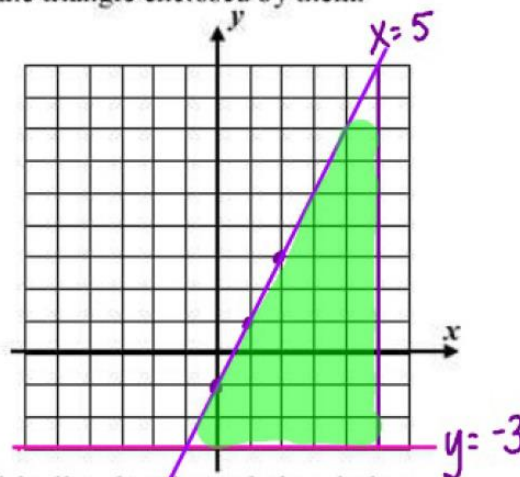


$$A_{\square} = l \cdot w$$

$$A = \frac{1}{2}bh$$

$$A = \frac{1}{2} \cdot 6 \cdot 12$$

$$A = 36 \text{ units}^2$$



Exercise #5 Create a rough sketch and then write the equation of the line that fits each description:

(a) parallel to the x -axis passing through $(3, 2)$

(b) parallel to the y -axis passing through $(-4, 3)$

