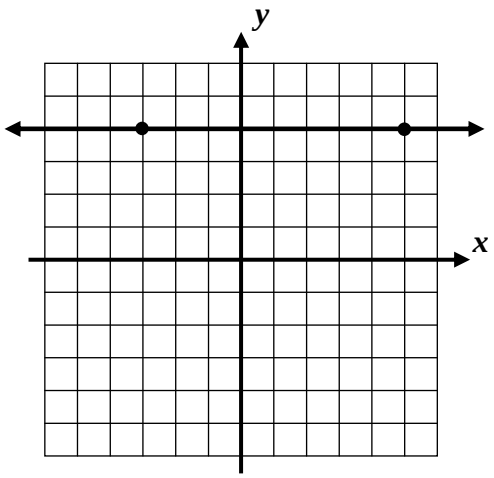
Name: _____ Date: _____

STRANGE LINES – VERTICAL AND HORIZONTAL
COMMON CORE ALGEBRA I

Although they don't fit the classic linear model, it is important to understand how we write equations for **horizontal and vertical lines**. The first exercise will illustrate the idea. Never forget, though, that when we create an **equation** for a **curve**, it simply **describes what all points on the curve share in common**.

***Exercise* #1:** Shown below are a horizontal line and a vertical line.

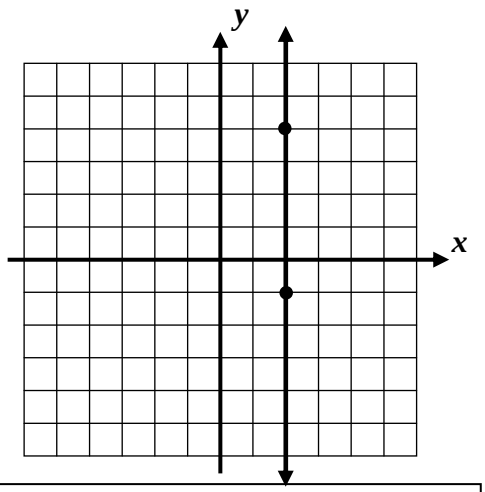


HORIZONTAL LINE

Write down two coordinate points:

What do they share in common?

What is this line's equation?



VERTICAL LINE

Write down two coordinate points:

What do they share in common?

What is this line's equation?

Equations of horizontal lines and vertical lines are so simple that students will often get them confused later, because they don't really seem like typical linear equations (because they aren't).

HORIZONTAL AND VERTICAL LINES

Horizontal Line: $y = \text{constant}$ **Vertical Line:** $x = \text{constant}$

(Constants can be determined by using any point the line passes through)

***Exercise* #2:** Which of the following equations represents a vertical line that passes through the point $(5, -3)$?

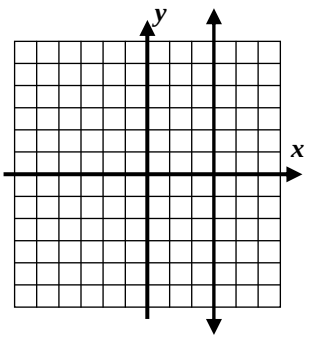
(1) $y = -3$ (3) $y = -3x + 5$

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

It is important to be able to quickly and accurately graph vertical and horizontal lines as well as give their equations based on their graphs. We will try to build some fluency with this in the next exercise.

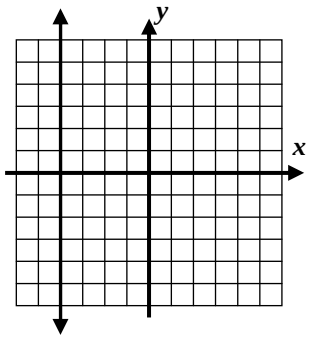
***Exercise* #3:** For each of the following, give the equation of the line shown or described.

(a)



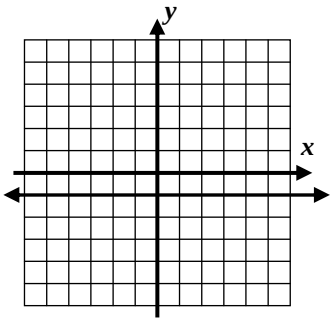
EQUATION: _____

(b)



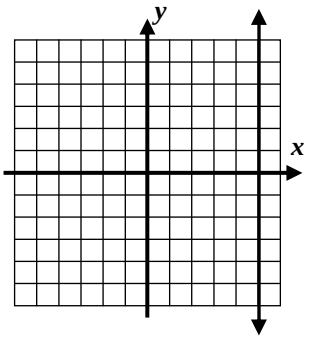
EQUATION: _____

(c)



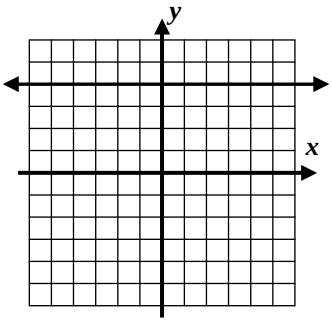
EQUATION: _____

(d)



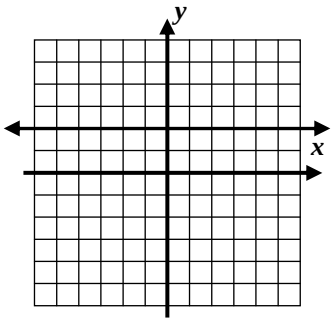
EQUATION: _____

(e)



EQUATION: _____

(f)



EQUATION: _____

(g) The equation of a vertical line passing through the point $(-4, 5)$.

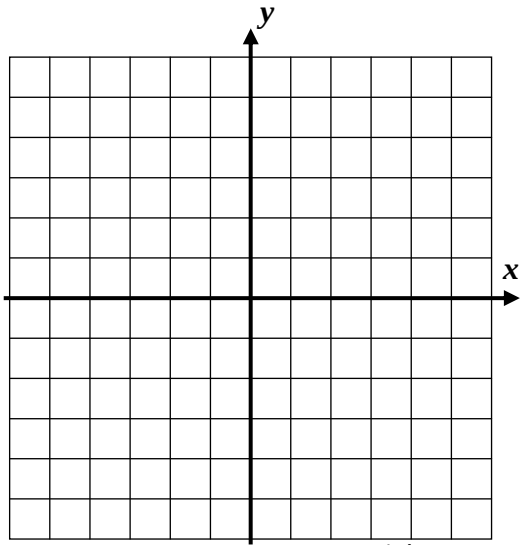
(h) The equation of a horizontal line passing through the point $(3, 2)$.

***Exercise* #4:** Sketch the region bounded by the three lines whose equations are given below. Label each with its equation. Find the area of the triangular region enclosed by the lines. You may want to use your calculator to create a table of values of the first line or simply use facts about the slope and *y*-intercept.

$y = 2x - 4$

$x = -1$

$y = 2$

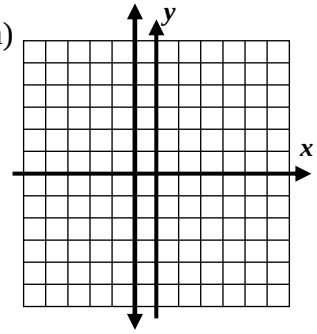


Name: _____ Date: _____

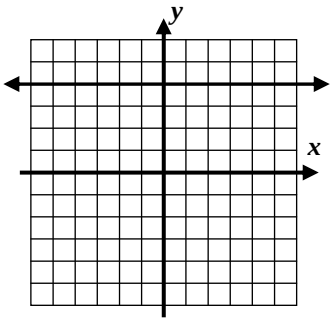
STRANGE LINES – VERTICAL AND HORIZONTAL
COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

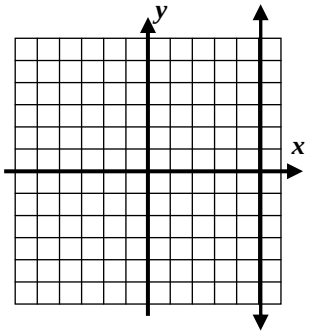
1. For each of the following, give the equation of the line shown.

(a) 

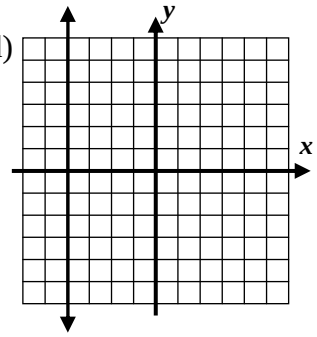
EQUATION: _____

(b) 

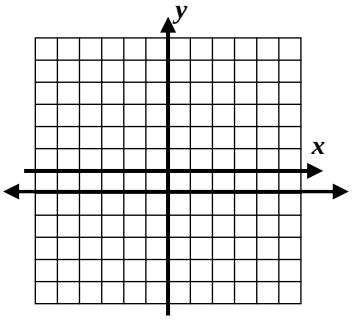
EQUATION: _____

(c) 

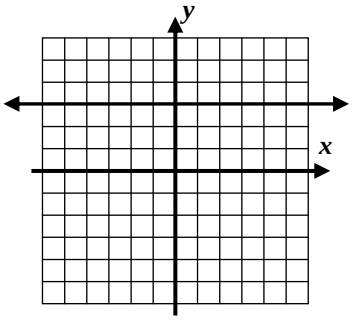
EQUATION: _____

(d) 

EQUATION: _____

(e) 

EQUATION: _____

(f) 

EQUATION: _____

2. Write the equations of lines that fit the following descriptions. Sketch a picture if needed.

(a) A vertical line that passes through the point $(4,-7)$.

(b) A horizontal line that passes through the point $(-2,3)$.

(c) A line parallel to the *x*-axis that passes through the point $(-2,15)$.

(d) A line perpendicular to the *x*-axis that passes through the point $(5,1)$.

3. Each of the following lines are either horizontal, vertical, or slanted. Label each with its type and then graph on the grid. Label each with its equation.

Type:

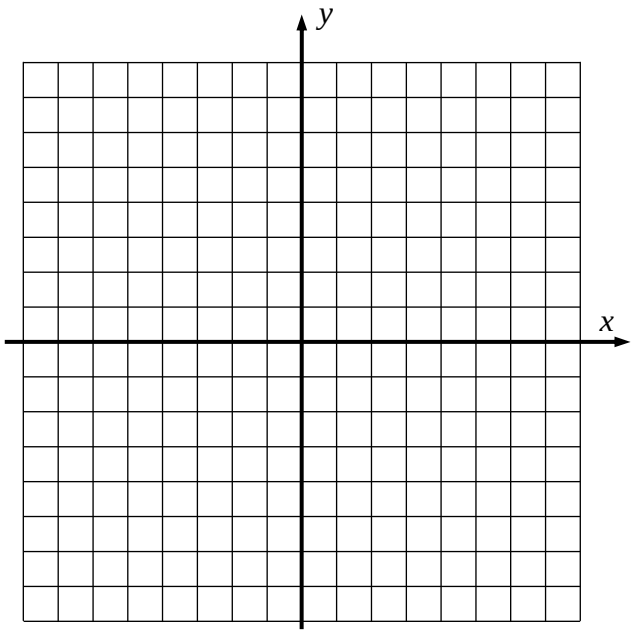
(a) $y = \frac{3}{5}x - 2$ _____

(b) $y = 6$ _____

(c) $y = -x + 7$ _____

(d) $x = -4$ _____

(e) $y = 2x + 1$ _____

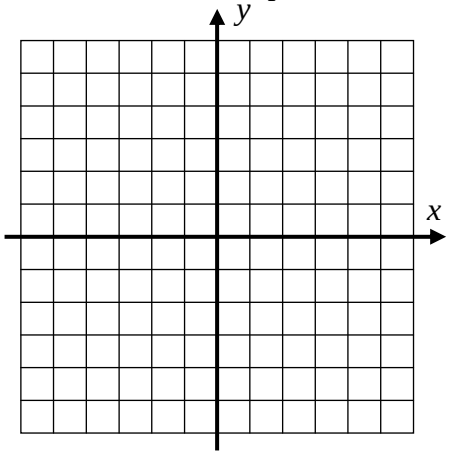


4. A rectangle is surrounded by the lines whose equations are shown below. Graph these lines and find the area of the rectangle enclosed by them.

$x = -4$ $x = 3$

$y = -2$ $y = 2$

Area: _____



5. The triangular region shown below is bordered by one vertical line, one horizontal line, and one slanted line. State the equation of each line and determine the triangle's area.

Vertical Line: _____

Horizontal Line: _____

Slanted Line: _____

Area: _____