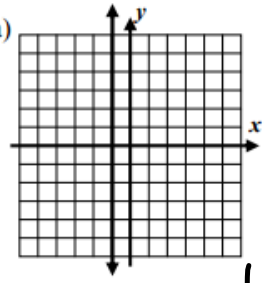
FLUENCY

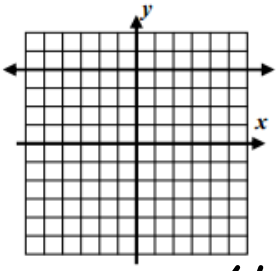
1. For each of the following, give the equation of the line shown.

(a)



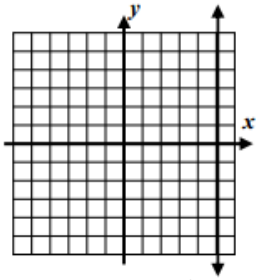
EQUATION: $x = -1$

(b)



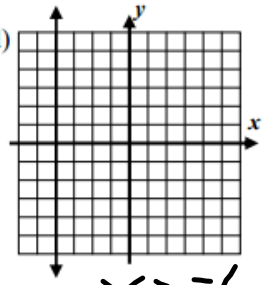
EQUATION: $y = 4$

(c)



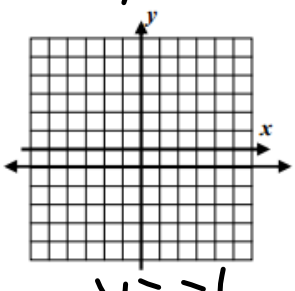
EQUATION: $x = 5$

(d)



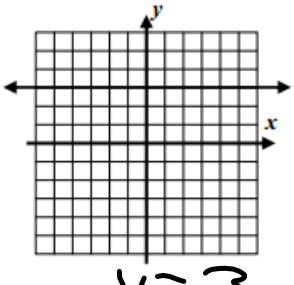
EQUATION: $x = -4$

(e)



EQUATION: $y = -1$

(f)



EQUATION: $y = 3$

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

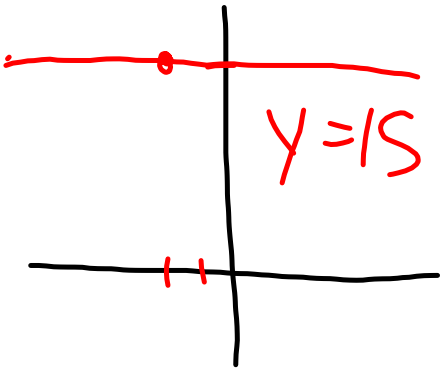
(a) A vertical line that passes through the point $(4,-7)$.

$x=4$

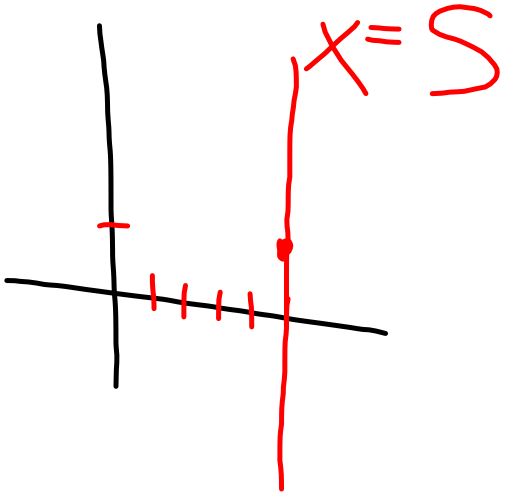
(b) A horizontal line that passes through the point $(-2,3)$.

$y=3$

(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:

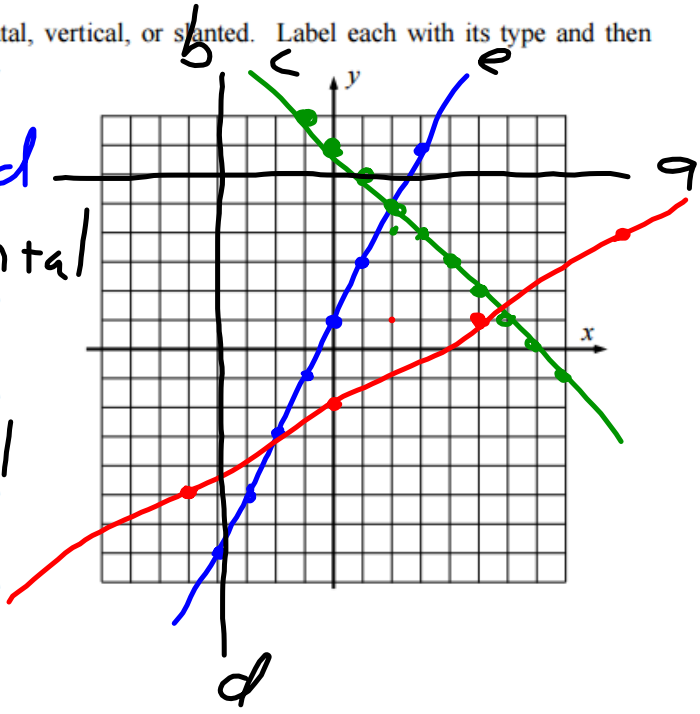
(a) $y = \frac{3}{5}x - 2$ slanted

(b) $y = 6$ horizontal

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

(d) $x = -4$ vertical

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

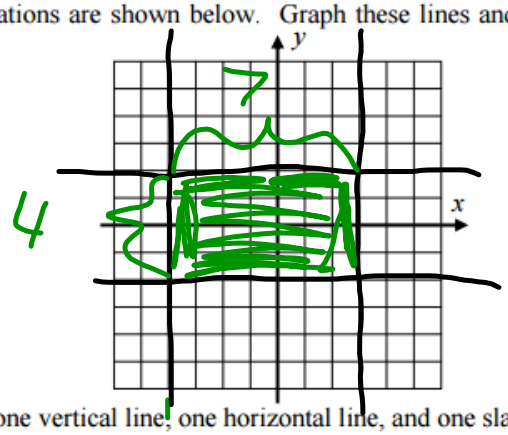


4. A rectangle is surrounded by the lines whose equations are shown below. Graph these lines and find the area of the rectangle enclosed by them.

$x = -4$ $x = 3$

$y = -2$ $y = 2$

Area: $4 \cdot 7 = 28$



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: $x = -2$

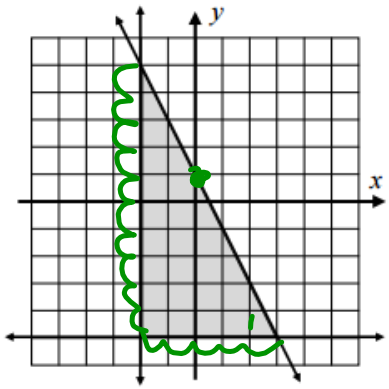
Horizontal Line: $y = -5$

Slanted Line: $y = -2x + 1$

Area: $\frac{1}{2}bh$

$b = 5$ $\frac{1}{2} \cdot 50 = 25$

$h = 10$



Bell Ringer:

Tomatoes cost $1.56 a pound. If Suzanne purchased 36 ounces of tomatoes, how much did she pay? Round to the nearest cent.

2 1/4 or 2.25

$\frac{36}{16} \rightarrow \frac{16}{16}, \frac{16}{16}, \frac{4}{16}$

2.25
× 1.56
3.51

If a clock ticks every second, how many times does it tick in a year?

[A] 3.0476×10^6 [B] 2.98×10^8

[C] 3.1536×10^7 [D] 3.169×10^7

60s - 1m.
60m. - 1hr
24hrs - 1d
365d - 1yr

31,536,000

3.1536×10^7

THE ABSOLUTE VALUE AND STEP FUNCTIONS
COMMON CORE ALGEBRA I

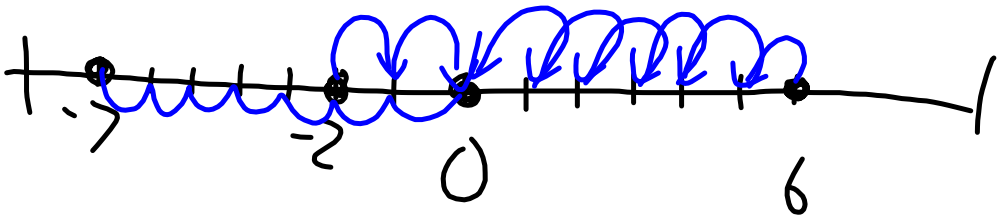
There are two very interesting functions that can be considered related to linear, the **absolute value function** and the **step function**. Let's start with the simpler of the two, the **absolute value**.

***Exercise* #1:** The absolute value gives us the "size" or **magnitude** of a number. Find each of the following.

(a) $|-7|$ (b) $|-2|$ (c) $|6|$ (d) $|0|$

7 2 6 0

O.k. So, that is easy enough. Now, what does the basic **absolute value** function "look like."



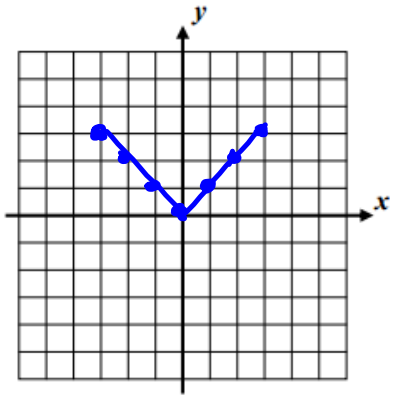
Exercise #2: Consider the absolute value function $f(x)=|x|$. Do the following.

(a) Evaluate $f(-7)$ and $f(4)$.

7 4

(b) Fill out the table below and graph the function over this interval. This should be extremely quick.

x	-3	-2	-1	0	1	2	3
$f(x)$	3	2	1	0	1	2	3



(c) What is the minimum value of the function on this interval?

0

(d) Over what domain interval is $f(x)=|x|$ increasing?

$0 \le x \le 3$

Exercise #3: For the function $f(x)=|x-4|+7$ which of the following is the value of $f(1)$? Show the calculations that lead to your answer.

(1) 10 (3) 12

(2) –2 (4) 4

$|1-4|+7$

$|-3|+7$

$3+7=10$

Step functions are another type of function that is related to the linear family. It's graph will reflect its **well chosen name**.

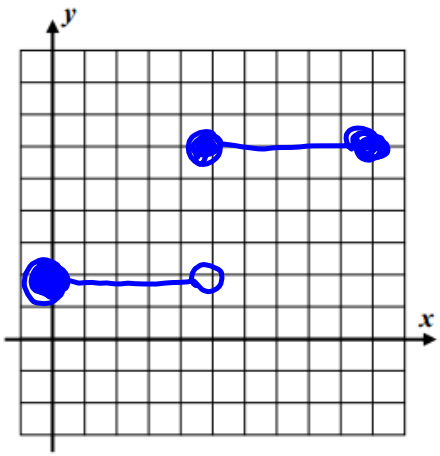
***Exercise* #4:** Consider the step function given by $f(x)=\begin{cases}2 & 0\le x<5\\ 6 & 5\le x\le 10\end{cases}$.

(a) Evaluate each of the following. After you do your evaluation, write down what coordinate point must lie on the graph as a result of the calculation.

$f(0)=2$ $f(2)=2$ $f(4)=2$

$f(5)=6$ $f(7)=6$ $f(10)=6$

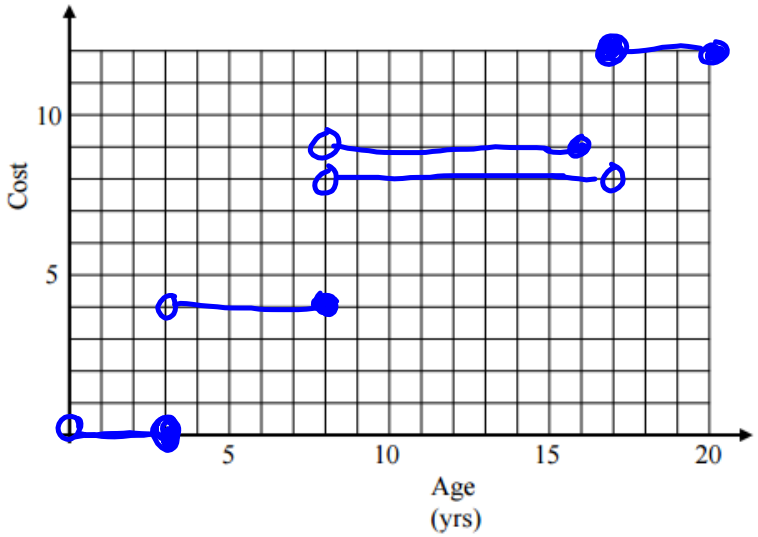
(b) Graph the step function on the grid to the right.



Step functions can arise in the real world whenever the **output** to a particular function is **constant** over particular ranges. Here's an example

***Exercise* #5:** At a local amusement park, the park charges an admission based on age. Graph the amount of money a person would have to pay for admission based on their age. Remember that someone who is one day short of 4 years old can consider themselves three and under.

Age Range	Price
3 and under	Free
8 and under	$4.00
16 and under	$8.00
17 and older	$12.00



FLUENCY

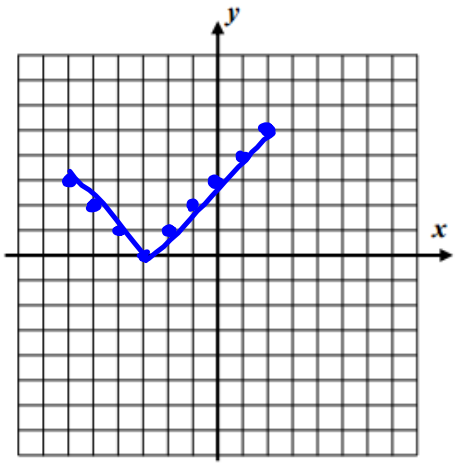
1. Consider the absolute value function $f(x)=|x+3|$ only on the interval $-6 \le x \le 2$.

(a) Evaluate $f(-5)$ and $f(2)$ without a calculator.

2 5

(b) Graph this function over the interval $-6 \le x \le 2$. Show your table below.

x	−6	−5	−4	−3	−2	−1	0	1	2
y	3	2	1	0	1	2	3	4	5



(c) Over which of the following intervals is $f(x)$ always increasing? Circle the correct choice.

(1) $-6 < x < -3$ (3) $-4 < x < 0$

(2) $-2 < x < 1$ (4) $-5 < x < 2$

(d) State the range of $f(x)$ on this domain interval.