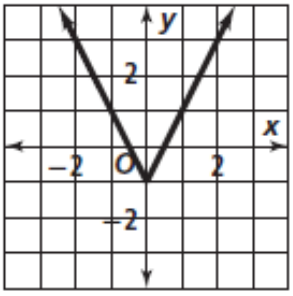
Day 1: Homework

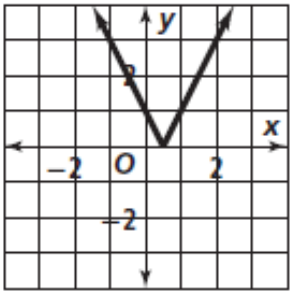
Match each equation with its graph.

1. $y = |x - 1|$
2. $y = 2|x - 1|$
3. $y = |2x| - 1$
4. $y = |x| - 1$
5. $y = |2x - 1|$
6. $y = |2x| - 2$

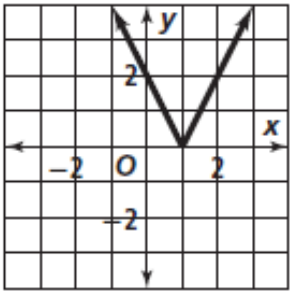
A.



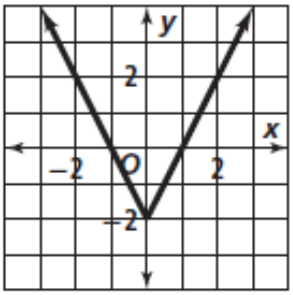
B.



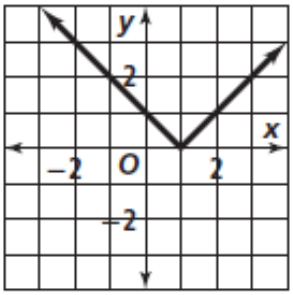
C.



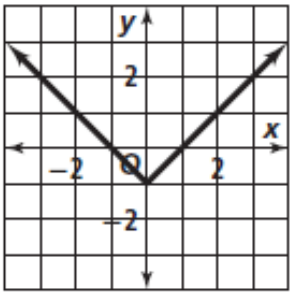
D.



E.



F.



On graph paper, graph each absolute value equation. Also indicate the domain and range.

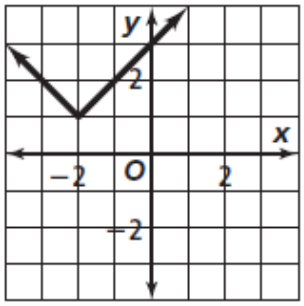
13. $y = |3 - x|$
14. $y = -\frac{2}{3}\left|\frac{1}{3}x\right|$
15. $y = 3 - |x + 1|$
16. $y = -|-x - 2|$
17. $3y = |2x - 9|$
18. $y = -|x| + 2$
19. $\frac{1}{2}y = |3x - 1| - 2$
20. $y + 3 = |x + 1|$
21. $-2y = |2x - 4|$

Write an equation for each translation. Also indicate the domain and range for the translation.

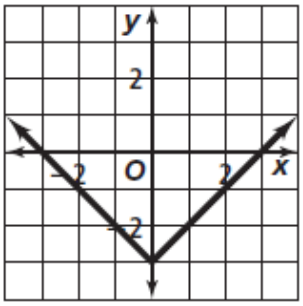
10. $y = |x|$, 1 unit up, 2 units left
11. $y = |x|$, 4 units right
12. $y = -|x|$, 3 units up, 1 unit right
13. $y = -|x|$, $\frac{3}{2}$ units down, $\frac{1}{2}$ unit right
14. $y = |x|$, 2 units down, 3 units left
15. $y = -|x|$, $\frac{3}{5}$ unit up

Write the equation of each translation of $y = x$ or $y = |x|$.

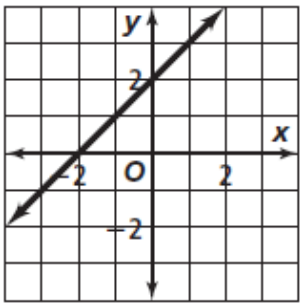
16.



17.

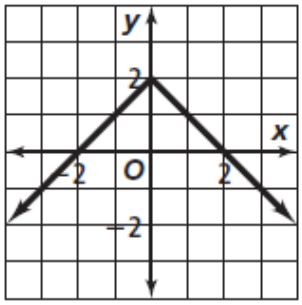


18.

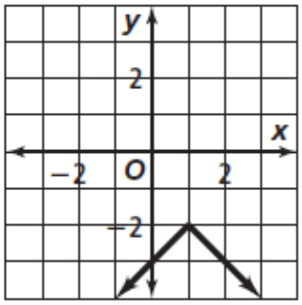


Each graph shows a translation of y = -|x|. State the values of h and k. Then, write an absolute value equation for the translation.

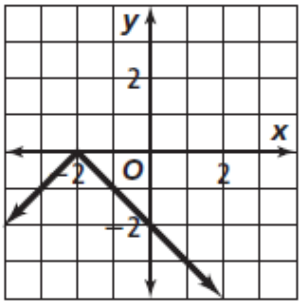
19.



20.

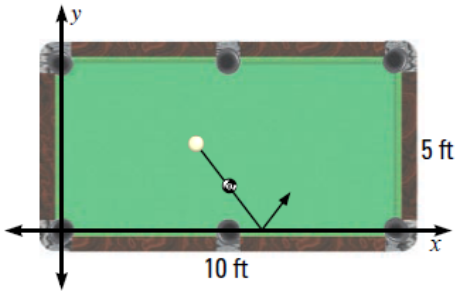


21.



22)

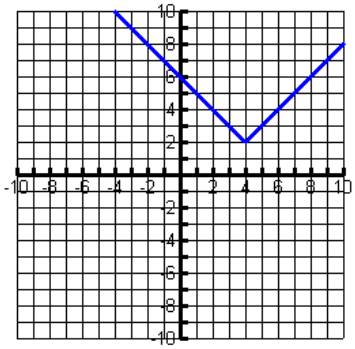
While playing pool, you try to shoot the eight ball into the corner pocket as shown. Imagine that a coordinate plane is placed over the pool table. The eight ball is at $\left(5, \frac{5}{4}\right)$ and the pocket you are aiming for is at (10, 5). You are going to bank the ball off the side at (6, 0).



a. Write an equation for the path of the ball.

b. Do you make your shot?

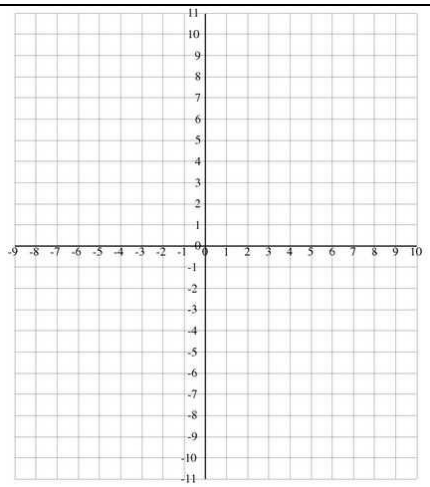
23) The graph shows an absolute value function after a translation 4 units up and 3 units left. Write the equation of the original function.



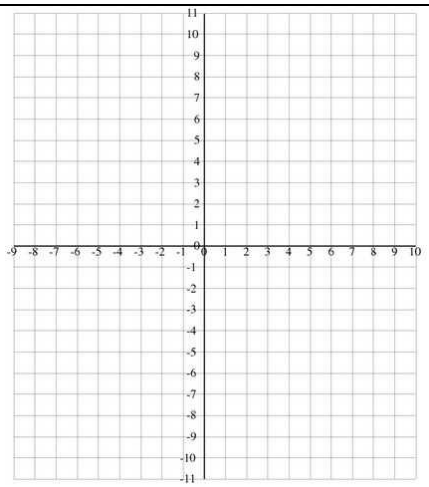
Day 2: Homework

Sketch the graph of the functions. State the domain and range and tell how they changed from the parent graph.

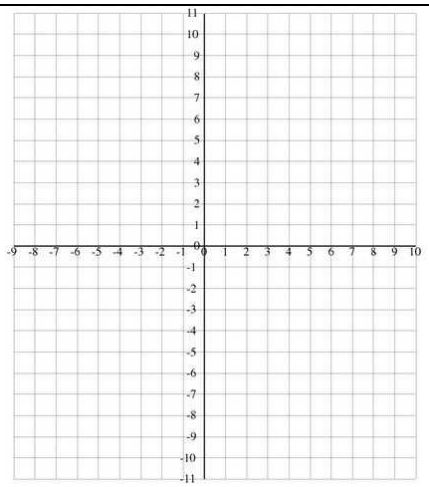
. $y = \sqrt{x+4}$



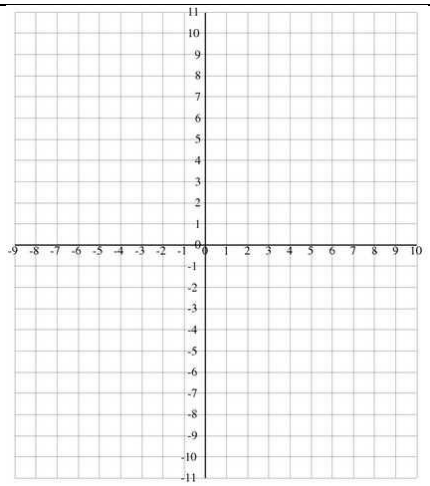
5. $y = -\sqrt{x} - 3$



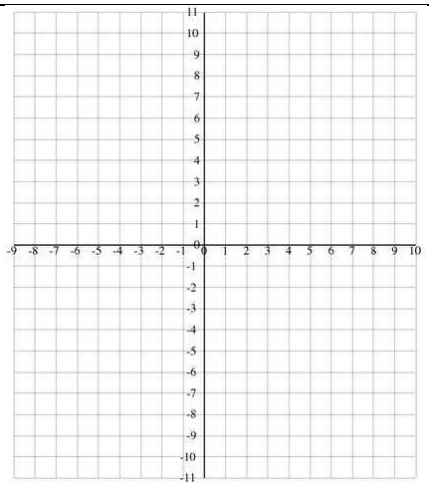
6. $y = 3 + \sqrt{x+3}$



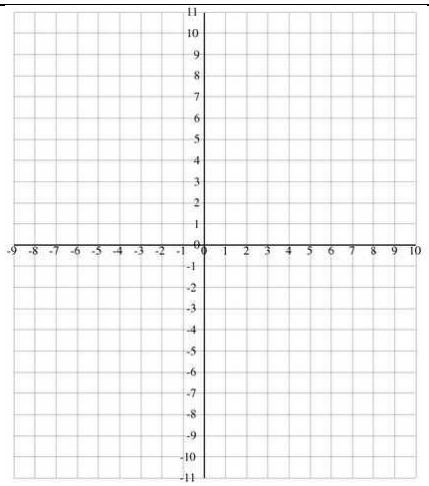
7. $y = -\sqrt{x-1} - 3$



8. $y = \sqrt{x}$



9. $y = \sqrt{x-2} + 1$



How would each of the following graphs change in relation to the parent graph?

a) $y=\sqrt[3]{x-3}$ _____

b) $y=\sqrt[3]{x+4}$ _____

c) $y=-3\sqrt[3]{x}$ _____

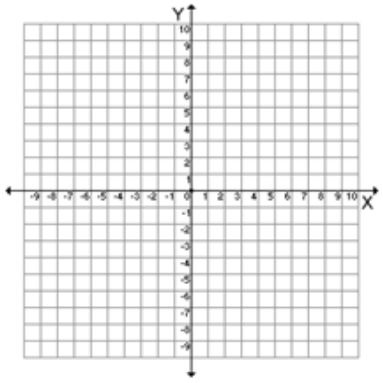
d) $y=\sqrt[3]{x}+5$ _____

e) $y=\sqrt[3]{x}-6$ _____

f) $y=3\sqrt[3]{x-2}+7$ _____

Graph the following cube root functions. Then state the domain and range of each function.

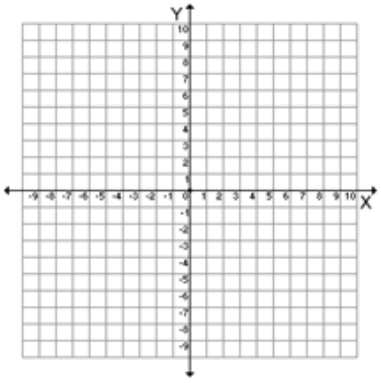
a) $y=-\sqrt[3]{x}$



Domain: _____

Range: _____

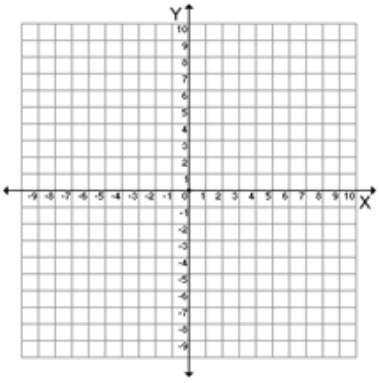
b) $y=3\sqrt[3]{x+5}$



Domain: _____

Range: _____

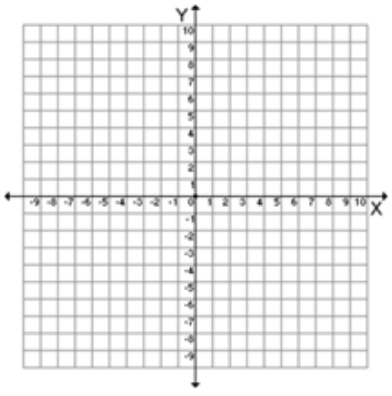
c) $y=\sqrt[3]{x}-2$



Domain: _____

Range: _____

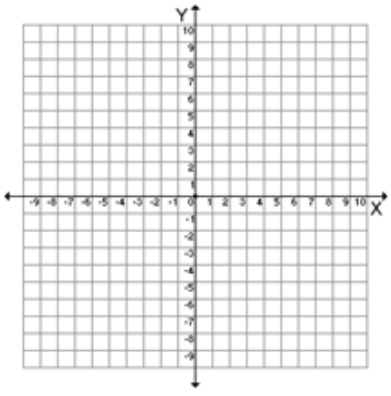
d) $y=-\sqrt[3]{x+3}$



Domain: _____

Range: _____

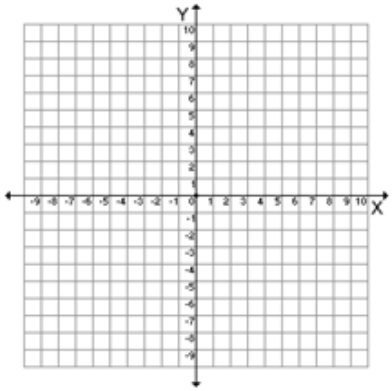
e) $y=\sqrt[3]{x+2}+5$



Domain: _____

Range: _____

f) $y=-\sqrt[3]{x+3}-3$



Domain: _____

Range: _____

Day 3: Homework (odds)

Write an equation for a translation of $y = -\frac{3}{x}$ that has the given asymptotes.

1. $x = 2; y = 1$
2. $x = -1; y = 3$
3. $x = 4; y = -2$
4. $x = 0; y = 6$
5. $x = 3; y = 0$
6. $x = 1; y = 2$
7. $x = -3; y = -1$
8. $x = -2; y = 1$

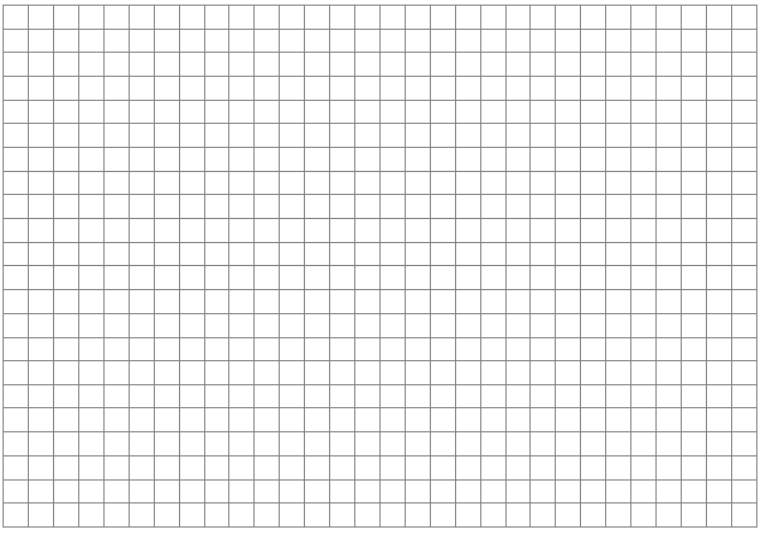
On a sheet of graph paper, graph each equation. Identify the asymptotes. Remember to also sketch the asymptotes.

9. $y = \frac{3}{x-1} + 2$
10. $y = \frac{2}{x+1}$
11. $y = \frac{11}{x+3} - 3$
12. $y = -\frac{4}{x-2} - 2$
13. $y = \frac{1}{x} + 3$
14. $y = \frac{1}{x+1} - 2$
15. $y = \frac{1}{x-2} + 1$
16. $y = \frac{1}{x-1} - 1$

17. ***Budgeting*** A high school spends \$750 each year on student academic achievement awards. The amount spent per award depends on how many awards are given.

Write and graph a function of the number "*a*" of awards given and the cost "*c*" of each award. Find the asymptotes.

Explain how the asymptotes are related to the given facts.



Day 4: Homework

Evaluate the following:

(1) [3.15] = _____ (2) [2.0] = _____ (3) [-π] = _____ (4) [5.6] = _____

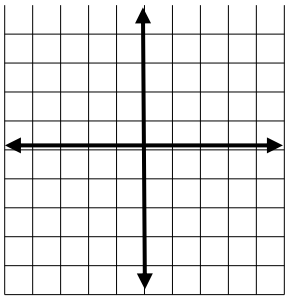
(5) [-6] = _____ (6) [-4.1] = _____ (7) [0] = _____ (8) [-5.6] = _____

Solve the following equations for *x* and write the answers in set notation:

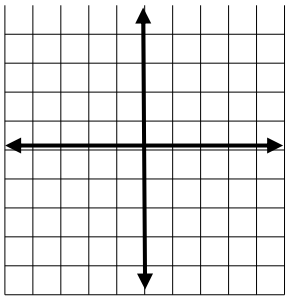
(9) $\left[\frac{2x}{3}\right] = 1$ (10) $[4x] = 12$ **(11) $[2x] = 3.5$

Using what you learned about the translations of $y = a|b(x - h)| + k$, graph the following. Then describe how they are changed from the parent graph.

(12) $f(x) = [x] - 4$



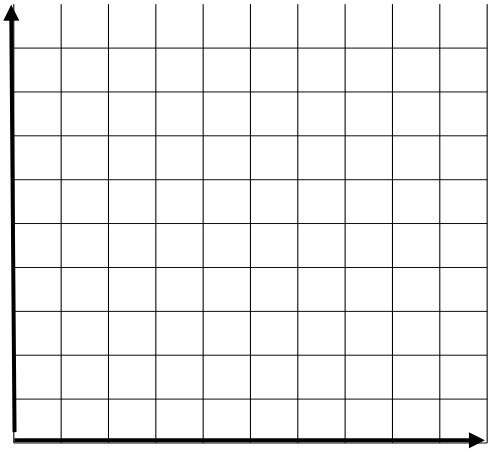
$g(x) = [x - 4]$



Prior to September, 2000, taxi fares from Washington DC to Maryland were described as follows: $2.00 up to and including ½ mile, $0.70 for each additional ½ mile increment.

(13) Describe the independent and dependent variables and explain your choices.

(14) Graph the fares for the first 2 miles: *(Make sure to label the axes.)*



Extension 1– Shipping

Your friend calls you on your cell to tell you about a great sale at an online store for some supplies you need for a school function. You find out that the shipping cost to get it in 2 days is $11.45 for the first pound and $0.60 more for each additional pound. You decide you can only spend $15 for shipping.

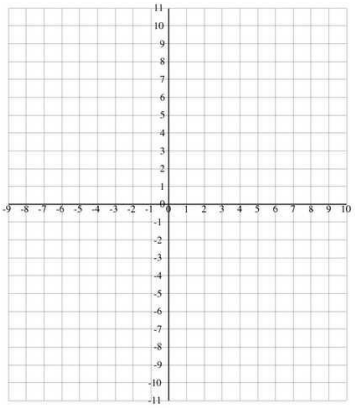
1) What is the domain of the cost function for shipping a package?

2) What is the range for this cost of shipping function? Make a sketch of what the graph would look like.

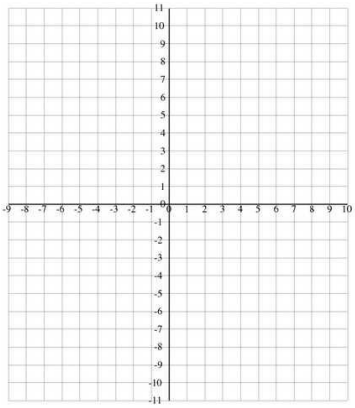
Extension 2 – Functions Review

Graph each of the following functions to confirm and to deepen your understanding of the solution. Determine the domain, range, and key features of each of the following functions.

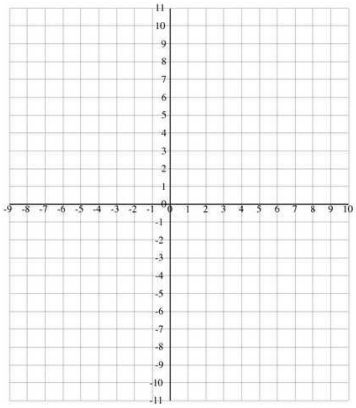
3) $y = x^2$



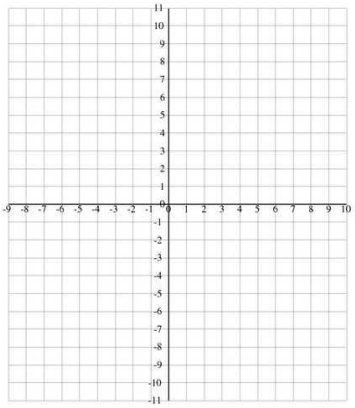
4) $y = \sqrt{x}$



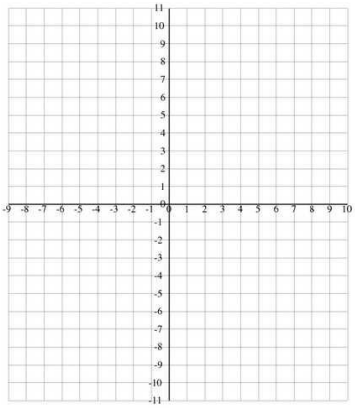
5) $y = \frac{5}{x}$



6) $y = \frac{3}{x+5}$



7) $y = \sqrt{2x-6}$



Day 5 Homework

Carefully graph each of the following. Identify whether or not the graph is a function. Then, evaluate the graph at any specified domain value. You may use your calculators to help you graph, but you must sketch it carefully on the grid!

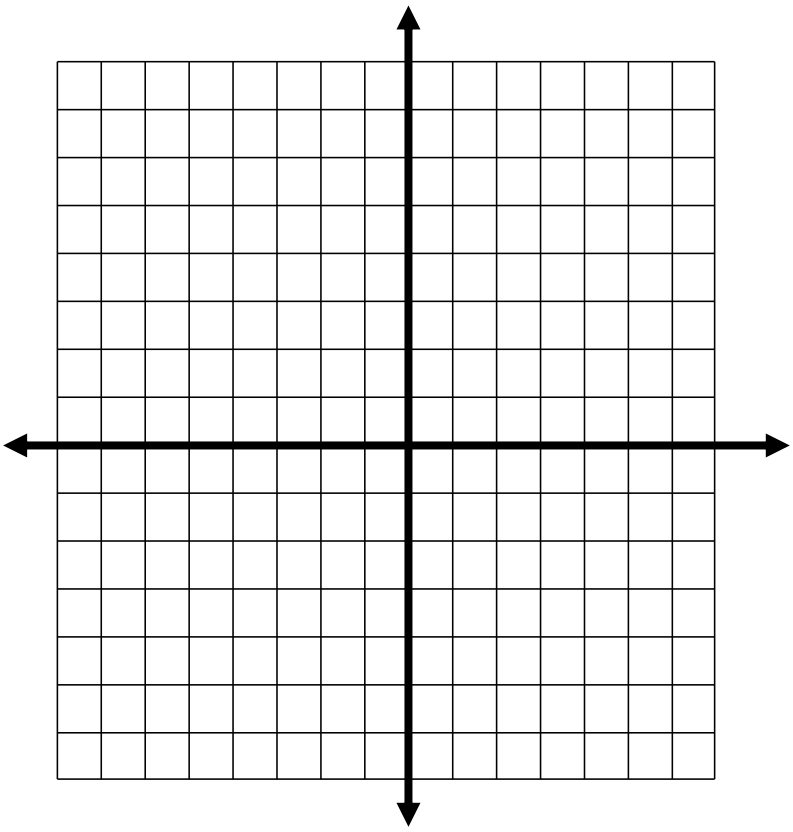
1. $f(x)=\begin{cases} x+5 & x<-2 \\ -2x-1 & x\geq -2 \end{cases}$

Function? Yes or No

$f(3)=$

$f(-4)=$

$f(-2)=$



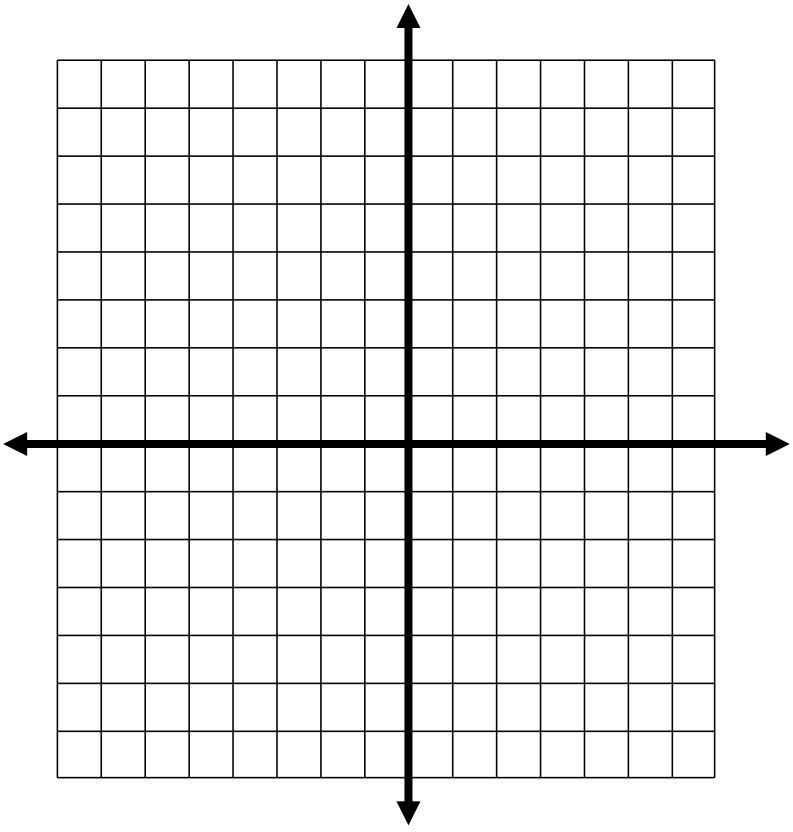
2. $f(x)=\begin{cases} 2x+1 & x\geq 1 \\ \frac{x}{2}-3 & x<1 \end{cases}$

Function? Yes or No

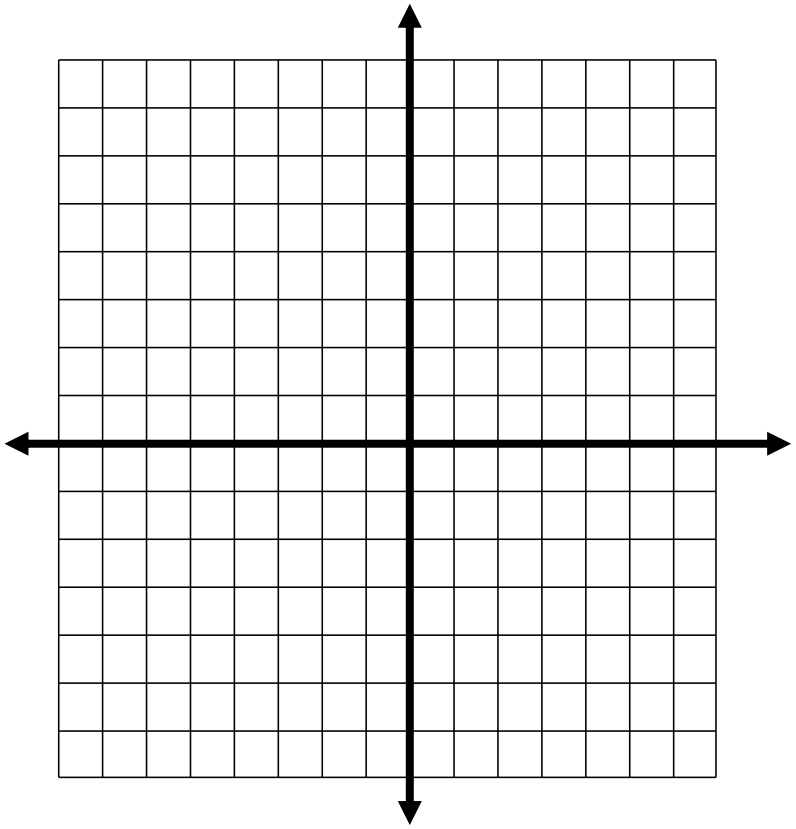
$f(-2)=$

$f(6)=$

$f(1)=$



3. $f(x)=\begin{cases}4x-2 & x\geq 2\\ -\frac{x}{3}+4 & x<2\end{cases}$



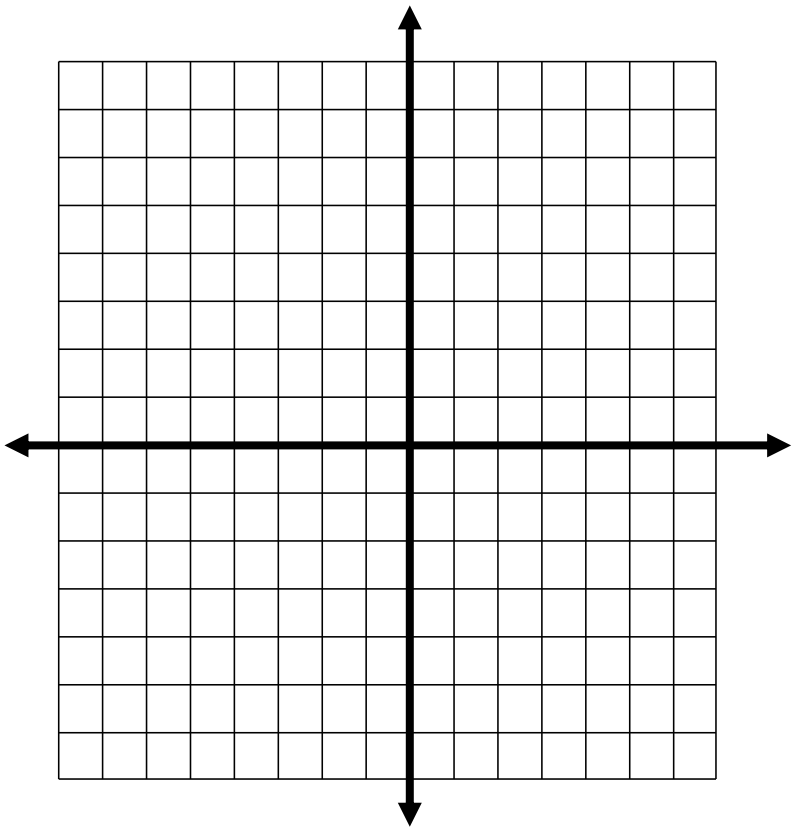
Function? Yes or No

$f(-4)=$

$f(8)=$

$f(2)=$

4. $\begin{cases}-x+4 & x\leq 0\\ \frac{2x}{3}-1 & 0<x\leq 5\\ 2 & x>5\end{cases}$



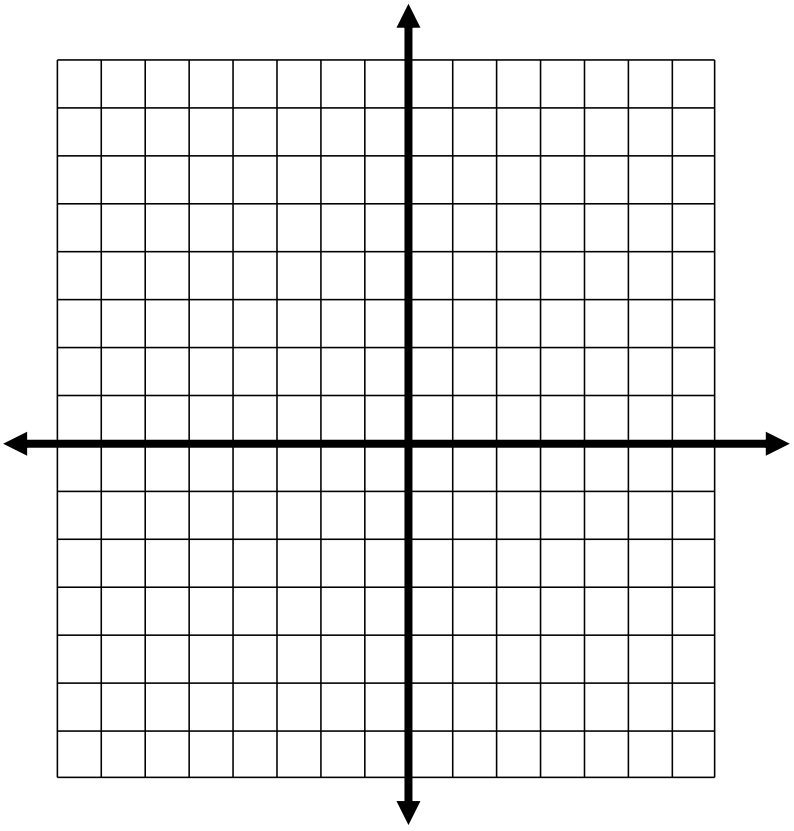
Function? Yes or No

$f(-2)=$

$f(0)=$

$f(5)=$

5. $f(x)=\begin{cases} -x+1 & x\le 0 \\ -\frac{4x}{3}-4 & x>0 \end{cases}$



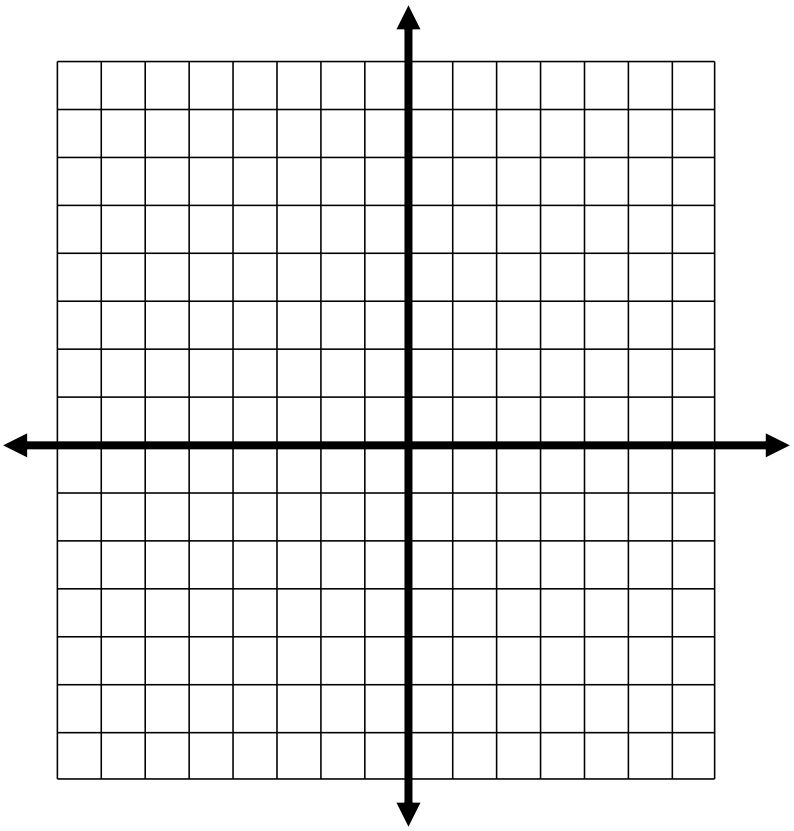
Function? Yes or No

$f(-4)=$

$f(0)=$

$f(3)=$

6. $f(x)=\begin{cases} -3 & x\le 3 \\ 2x-5 & x>3 \end{cases}$



Function? Yes or No

$f(-4)=$

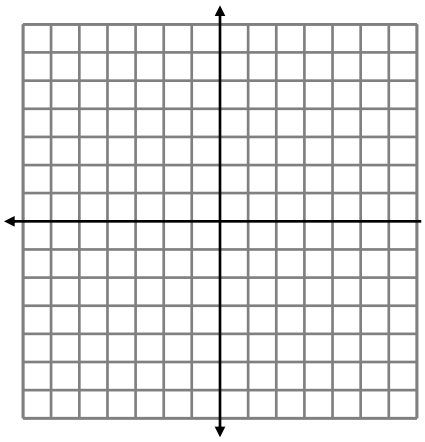
$f(0)=$

$f(3)=$

Homework Day 6

Graph each piecewise function. State the domain and range.

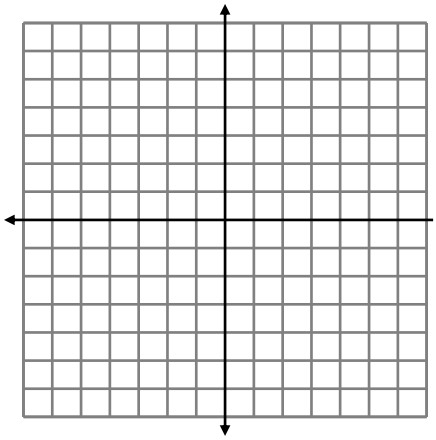
1) $g(x) = \begin{cases} -x+4 & \text{if } x \le -2 \\ x+1 & \text{if } x > -2 \end{cases}$



Domain: _____

Range: _____

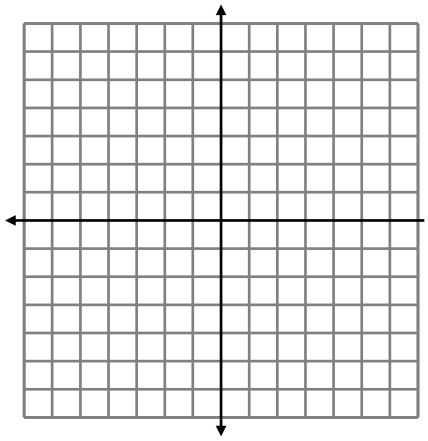
2) $f(x) = \begin{cases} x^2+2 & \text{if } x \le 2 \\ \frac{1}{2}x+3 & \text{if } x > 2 \end{cases}$



Domain: _____

Range: _____

3) $f(x) = \begin{cases} x & \text{if } -4 \le x \le -1 \\ x+2 & \text{if } -1 < x < 4 \\ -3x+18 & \text{if } 4 \le x \le 6 \end{cases}$



Domain: _____

Range: _____

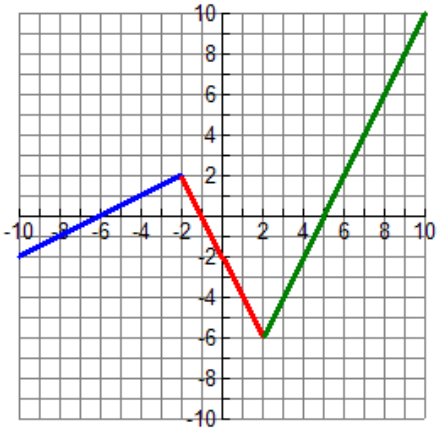
Evaluate the piecewise function, $m(x)$. If there is no value for the given input, write, undefined.

4) $m\ x = \begin{cases} -6 & \text{if } x < 0 \\ x + 5 & \text{if } 0 \le x \le 12 \\ -2x + 5 & \text{if } x > 12 \end{cases}$

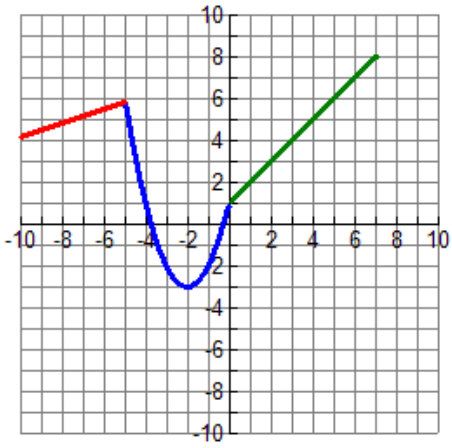
a) $m\ 0$ b) $m\ 5$ c) $m\ 14$

Write the piecewise functions and their restrictions for the graphs below:

5)



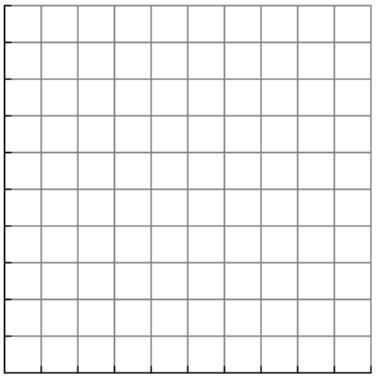
6)



7) Shelly earns $8 an hour. She earns $12 an hour for each hour over 40 that she works.

a) Write piecewise functions that represent the money earned by Shelly for when she works regular hours and overtime hours.

b) Sketch a graph of Shelly's earnings versus the number of hours that she works up to 60 hours.



c) How much money will Shelly earn if she works 70 hours in one week?

Day 7 Homework:

For each of the following tables of data,

- Graph the points (on your own graph paper!!!).
- Find a power function that models the data.
- Determine whether the function is direct or inverse variation.
- Fill in the missing values in the table

1.

Distance of a race	0 miles	1 mile	2 miles	3 miles	4 miles	5 miles	8 miles	10 miles	13.1 miles	26.2 miles
Finishing Time			14.5 min.	21.75 min.	29 min.		58 min.	72.5 min.	94.975 min	

Power function: _____

Direct or Inverse?
_____

What distance was the race if the finishing time was 45.31 min? _____

2.

Time spent digging a hole (hrs)	144	72	48	36	24	16	12	9	6	2
Number of people working			3	4		9	12		24	72

Power function: _____

Direct or Inverse?
_____

How many people were working if they spent 60 hours digging? _____

3.

Time spent at work	144 hrs.	72 hrs.	48 hrs.	36 hrs.	24 hrs.	16 hrs.	12 hrs.	9 hrs.	6 hrs.	2 hrs.
Pay check amount ($)		648	432		216					

Power function: _____

Direct or Inverse?
_____

About how long would you have to work to make $1000? _____

For each equation, determine the type of symmetry and which graph it would be most similar to of x^2, x^3, x^{-2}, and x^{-1}

4. $y = 5x^4$ 5. $y = 3x^{-6}$ 6. $y = \frac{1}{2}x^{-5}$ 7. $y = 1/6x^8$