Assignments for Algebra 2
Unit 1: Review of Algebra 1

Day	Date	Notes	Assignment
Monday	8/9/21	Class Business	Syllabus
Tuesday	8/10/21	Combining Like Terms and Distributive Property	1.1 Worksheet
Wednesday	8/11/21	Solving Linear Equations and Inequalities Part I	1.2 Worksheet
Thursday	8/12/21	Solving Linear Equations and Inequalities Part II	1.3 Worksheet
Friday	8/13/21	Slope Intercept Form and Writing Equations of Lines	1.4 Worksheet
Monday	8/16/21	Solving Systems by Graphing and Substitution	1.5 Worksheet
Tuesday	8/17/21	Solving by Elimination	1.6 Worksheet
Wednesday	8/18/21	Solving Absolute Value Equations and Graphing Absolute Value Functions	1.7 Worksheet
Thursday	8/19/21	Domain and Range	1.8 Worksheet
Friday	8/20/21	Notation	1.9 Worksheet
Monday	8/23/21	Piecewise Functions – Restricted Domains	1.10 Worksheet
Tuesday	8/24/21	Piecewise Functions – Part II	1.11 Worksheet
Wednesday	8/25/21	Review	Unit 1 Review
Thursday	8/26/21	Review	Unit 1 Review
Friday	**8/27/21**	**Unit 1 Celebration of Knowledge**	

****Assignment dates are subject to change****

HW reminders:

- If you cannot solve a problem, get help **before** the assignment is due.
- Help is available before school, during lunch, or after school.

Algebra 2 – Unit 1 – Review of Algebra 1

Day 1 – Combining like Terms and Distributive Property

Objectives: SWBAT evaluate and simplify expressions involving real numbers.
SWBAT evaluate exponents
SWBAT combine like terms
SWBAT plug values into expressions
SWBAT apply Distributive and Double Distributive Properties

Exponent Vocabulary

$3x^5$

Base – the number that gets multiplied when using the exponent

Coefficient – a number used to multiply to a variable

Exponent – the number of times you multiply the base by itself

***Simplify* the following expressions.**

1. 3^4

2. $(-2)^4$

a. $(-5)^3$

3. -4^2

4. $2x^3$

5. $(4y)^2$

b. $(6x)^3$

Adding and Subtracting Expressions Vocabulary

Terms – a single number, variable (or combination) separated by a + or –

Like Terms – terms with the same exact variable make-up

Constant – a number (no variable)

Simplified – an expression where all like terms have been combined and in descending order

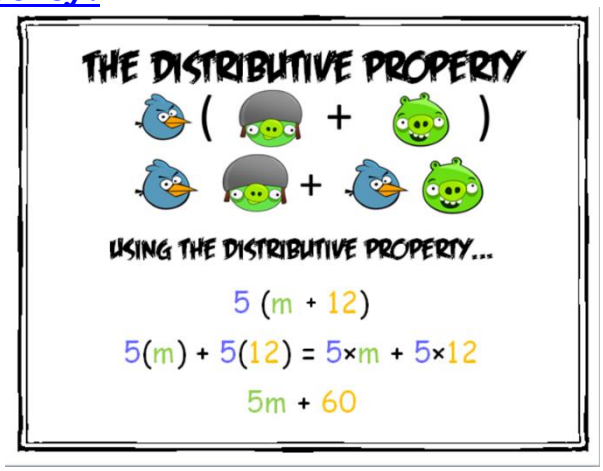
Simplify the following expressions.

6. $(7z^2 + 2z) + (6z^2 + 3z)$

7. $(9v - 8w) - (10w - 5v)$

c) $(7y^3 - 11x^2) - (8x^2 + y^3)$

Multiplying Expressions AKA Distributive Property:

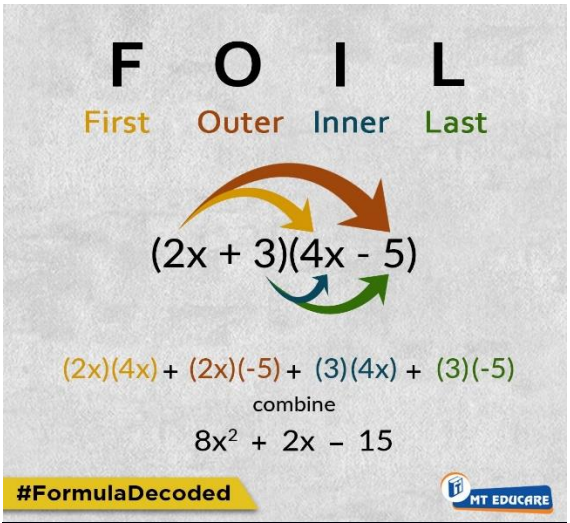


8. $-2x^2\left(3x^3+3x^2-2x+5\right)$

9. $3-2(4m-2)$

d) $5m(3m^2-m+8)$

Multiplying Expressions with FOIL AKA Double Distributive Property:

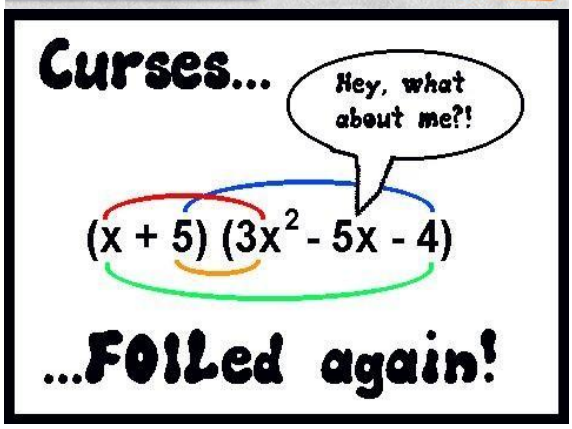


10. $(2x-9)(3x+4)$

e) $(x+6)(x-7)$

10. $(2x-3)(5x^2-x+3)$

f) $(x+1)(x^2-3x+5)$



BE CAREFUL WHEN YOU HAVE PARENTHESIS

11) $(y-6)^2$

12. $(m+2)^3$

Day 2 – Solving Linear Equations and Inequalities – Part I

Objectives: SWBAT solve linear equations and inequalities.
SWBAT use a formula.
SWBAT isolate any variable in a formula or literal equation.

Equation – Two expressions that are equal or have the same value

Inequality Equation – an equation where a range of values make it true

REMINDER: When _____or _____an inequality by a _____number, _____ the direction of the inequality.

Solve – a value (or values) that make an equation true.

Solving One Step Equations

Solve and check the following equations.

1. $3x = -12$ **2.** $y - 11 = 15$ **a.** $-42 = 7m$ **3.** $\frac{m}{-4} < 6$

Reciprocal – Flipping a fraction.

Solving equations using reciprocals

Solve the following equations.

4. $\frac{7}{8}r = 21$ **5.** $\frac{3}{2}b \geq 12$ **b.** $\frac{5y}{6} = -4$ **6.** $\frac{x}{8} = \frac{3}{4}$

Solving One and Two Step Equations

6. $\frac{x}{-7}+8=3$

7. $13<-\frac{3}{5}w-5$

c. $4x - 9 = -7$

8. $\frac{1}{2}-m=\frac{5}{6}$

Day 3 – Solving Linear Equations & Inequalities – Part II

Objectives: SWBAT solve linear equations and inequalities.
SWBAT use a formula.
SWBAT isolate any variable in a formula or literal equation.

Variables on the Same Side:

Solving equations by combining like-terms.

1. $7y - 3y + 12 = 32$

2. $-4 > x + 4 - 9x$

a. $4 + 5a - 7 \leq 17$

Variables on Opposite Sides:

3. $n-6=2n-14$

4. $-14x>3x+17$

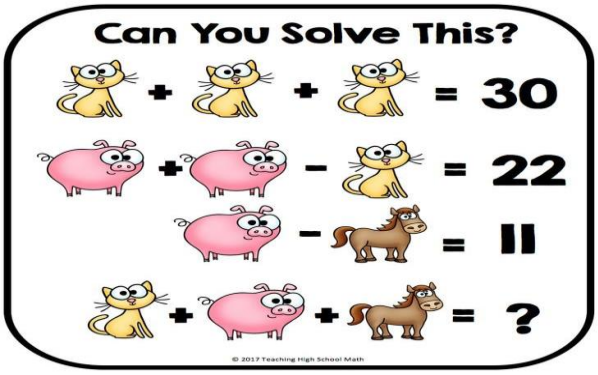
b. $6-2x=3x-14$

Special Cases – when an equation as no single answer, it is **All Real Numbers** or **No Solution**

4. $-2(3x+1)-4=-6x-6$

c. $-2(x-6)+4\le -17-2x$

Formulas and Rewriting Equations:



Example: The equation $C=\frac{5}{9}(F-32)$ is used to change temperature from Fahrenheit to Celsius. Find the equivalent Celsius temperature for each of the following Fahrenheit temperatures.

5. 212° F

d. 70° C

***Solve* each equation for the indicated variable**

6. $A=\frac{1}{2}(b_1+b_2)h$, for b_1

e. $a^2 + b^2 = c^2$, for a

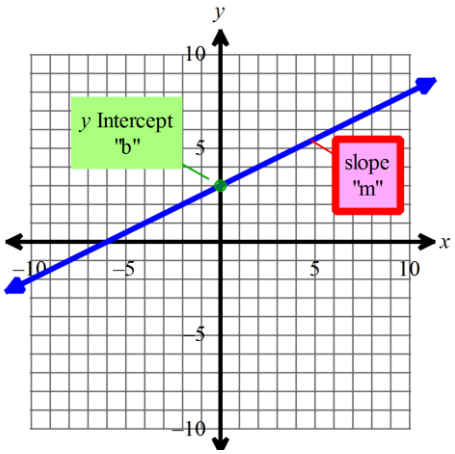
Day 4 – Slope Intercept Form and Writing Equations of Lines

Objectives: SWBAT graph lines
SWBAT write the equation of lines from their graphs
SWBAT write the equation of lines from a point and a slope

Slope Intercept Form – a line written in the equation form $y = m$

Slope – the rate of change of a line $m = \frac{y_2-y_1}{x_2-x_1}$ or $m = \frac{rise}{run}$

***y* – Intercept –** where the graph crosses the y-axis



State the slope and the *y*-intercept for each of the following equations.

1. $y = x - 1$

m: _____

b: _____

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

m: _____

b: _____

a. $y = \frac{1}{3}x + 1$

m: _____

b: _____

3. $y = 5$

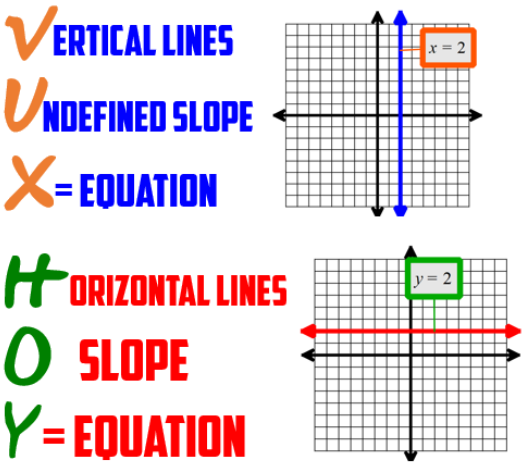
m: _____

b: _____

b. $x = -3$

m: _____

b: _____



Rewrite each equation into slope-intercept form.

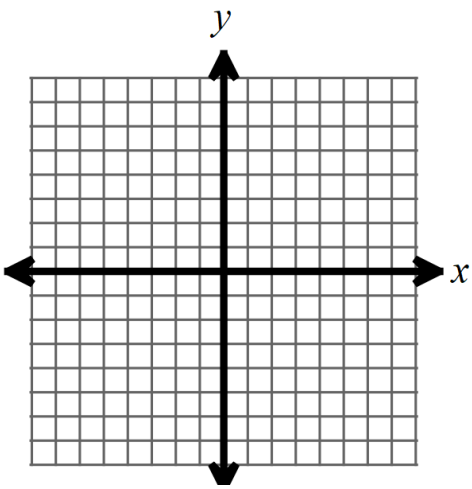
5. $3x + 2y = 15$

6. $2x - y = 0$

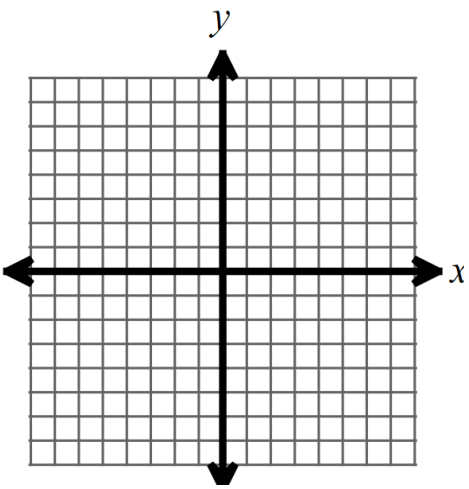
b. $\frac{1}{2}x - 2y = 14$

Graph each equation.

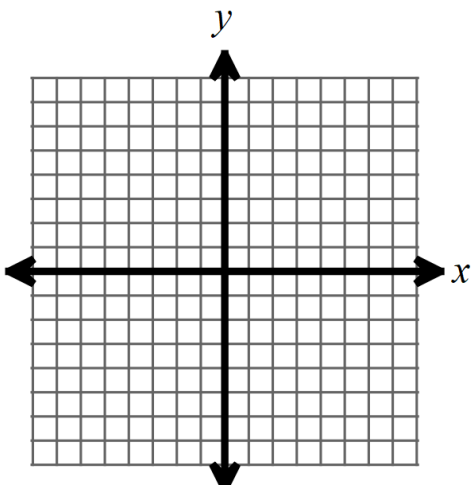
7. $f(x) = \frac{2}{3}x - 1$



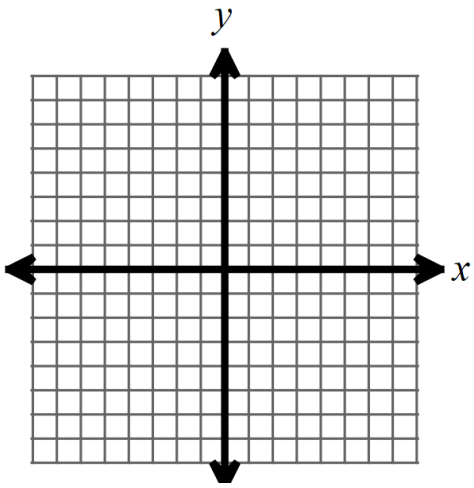
8. $3x - 2y = 4$



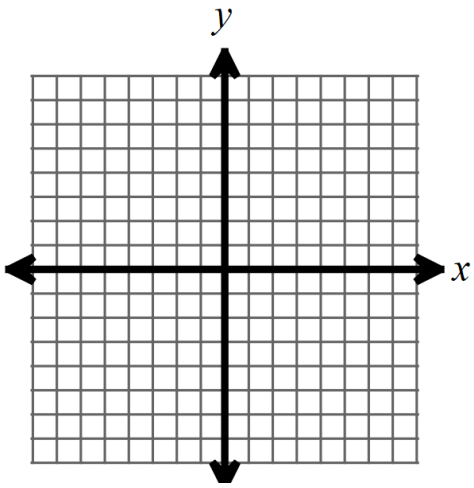
c. $y = -\frac{1}{3}x - 6$



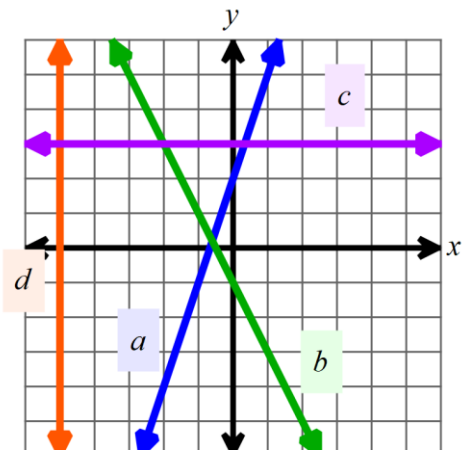
9. $y = -2$



d. $x = 5$



Write the equation of each line graphed below.



10. Line *a*:

11. Line *c*:

e. Line *b*:

f. Line *d*:

Point Slope Form – a line written in the equation form $y - y_1 = m(x - x_1)$ or $\boldsymbol{y = a(x - h) + k}$

Use point slope form to write an equation for each problem. ***Then change it to slope intercept form*.**

12. It passes through (4, 2) with a slope of –4

13. Contains an *x*-intercept of 2 and *y*-intercept of 3

g. Contains (4,1) and the slope is undefined

Day 5 – Solving Systems of Equations by Graphing and Substitution

Objectives: SWBAT solve systems of equations by graphing.
SWBAT solve systems of equations by Substitution

System of Equations- two or more equations that share variable values.

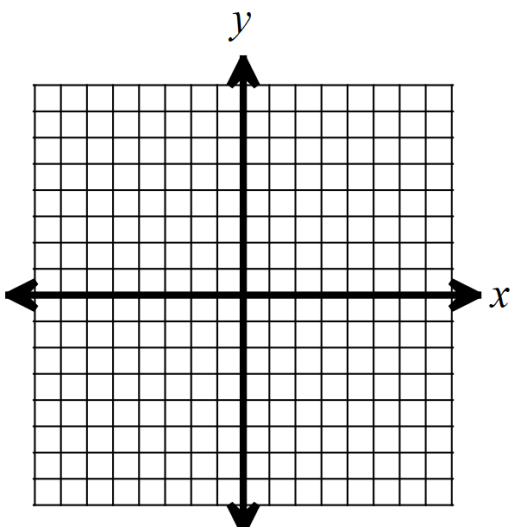
Solution to a System of equations – Where the two equations intersect or a point.

Finding Solutions to Systems of Equations by Graphing

1. Graph the first line
2. Graph the second line
3. Find where the two lines intersect
4. Your Answer is a point

Solve the following systems by graphing.

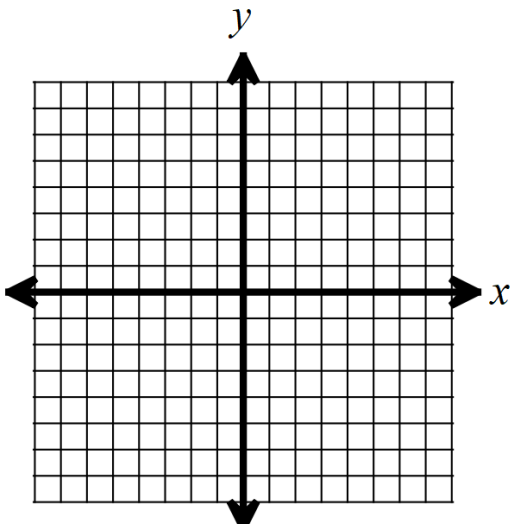
1. $y = 3x + 4$ and $y = \frac{1}{2}x - 1$



Intersection point

Check

a) $f(x) = 2x + 3$ and $y = -3x - 2$



Intersection point

Check

Solving Systems of Equations by Substitution:

1. Look at the system of equations. Decide which problem will be the easiest to isolate a variable. You have 4 ways to proceed. WORKER SMARTER NOT HARDER
2. Decide which variable you want to solve for, and isolate that variable.
3. Plug or "Substitute" the equation into the variable into the other equation, solve for the single variable.
4. Substitute the value of the first variable, and plug it back into the first equation. Solve for the second equation. This will produce the part of your answer.
5. Check it! Put both values into both equations to see if it checks out.
6. ***** If the two equations are the same, the answer is **Infinitely Many Solutions**
7. ****** If the two equations are parallel, then there is **No Solution**

Solve the following systems of equations using substitution.

2. $\begin{aligned} x &= 6 \\ y &= 2x - 3 \end{aligned}$

b. $\begin{aligned} 3x + 6y &= 18 \\ y &= 2 \end{aligned}$

3. $x = y + 2$ and $2x + y = 13$

c. $y = 3x - 4$ and $5x + y = -4$

4. $\begin{aligned} 3x - 2y &= 5 \\ 2x + 4y &= -2 \end{aligned}$

d. $\begin{aligned} x + y &= 2 \\ y - x &= -20 \end{aligned}$

Day 6 – Solving Systems of Equations by Elimination

Objectives: SWBAT solve systems of equations by Elimination

Solving Systems of Equations by Elimination:

1. Put both equations into the Standard form. Usually this will be $Ax + By = C$ form (x and y on the same side of the equation)
2. Multiple one or both equations have one set of opposite coefficients (same number but opposite signs).
3. Add the two equations together. Make sure this cancel out one of our variables. Solve the remaining equation. You just found first part of your answer.
4. Substitute the value for the solved variable back into either equation. Then solve the remaining equation. This is the other part of your answer.
5. Write your answer as a x=_____, and y=_____ or as an ordered pair.
6. If both variables cancel out, and the remaining constants form a true statement then it is **Infinitely Many Solutions**, and if it is a false statement then it is **No Solution.**
7. Check your Work.

Solve the following systems of equations using elimination.

1. $3x + 2y = 17$ *and* $5x - 2y = 7$

a) $3x + y = 3$ and $-3x - 4y = 6$

2. $5x + y = -10$ and $2x - 3y = 13$

3. $7x + 2y = -2$ and $2x = 14 - 3y$

b. $3x + 2y = 5$ and $2x - 5y = -41$

4. $3x - 4y = 18$ <u>and</u> $9x - 12y = 54$

5. $6y + 37 = 5x$ <u>and</u> $3x - 9 = 4y + 14$

Day 7 – Solve Absolute Value Equations and Graphs

Objectives: SWBAT to solve absolute value equations
SWBAT graph Absolute Value Functions

Absolute Value – the distance a number is from zero

Absolute Value Review: - Simplify the following

1. $|4-8| =$

2. $|-6-12| =$

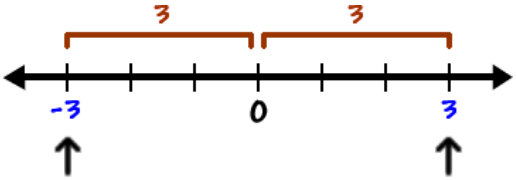
a. $|-9+13| =$

3. $-|-6| =$

4. $-|12-3| =$

b. $-|0-3| =$

Absolute Value Equations:



1. Isolate the absolute value expression.
2. Make two equations.
   a. Write one equation where it is exactly the same without the absolute value bars
   b. Write one where the equation equals the opposite number
3. Solve Both Equations

Solve the following absolute value equations.

5. $|x| = 4$

6. $|5x+20| = 45$

c. $|x+3| = -15$

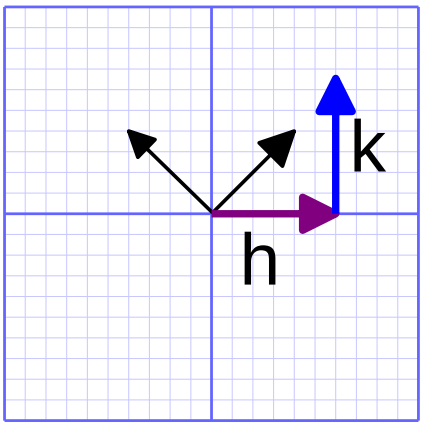
7. $|3x+5|+6=2$

8. $-3|4x+2|-7=-19$

d. $-2|3x-6|-7=-19$

Absolute Value Functions

$$y=\pm a|x-h|+k$$



Vertical Stretch /Shrink:

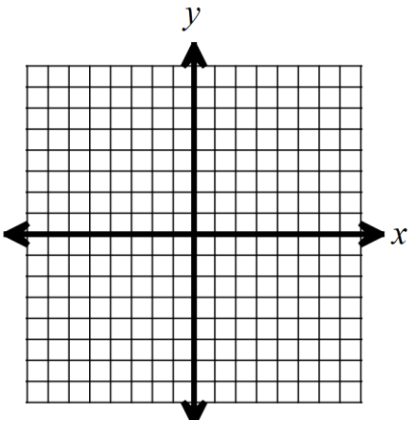
Reflection:

Translation:

Vertex of an Absolute Value Graph:

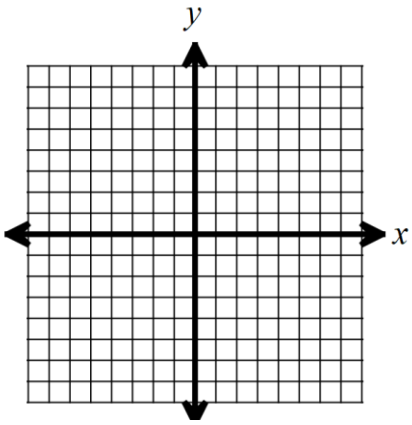
Graph the following using transformations.

9. $y=|x+4|-2$



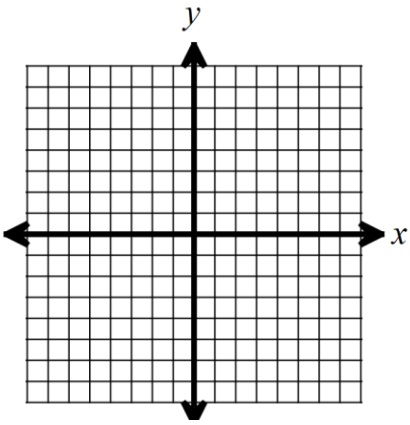
Vertex: _____

10. $y=2|x|-5$



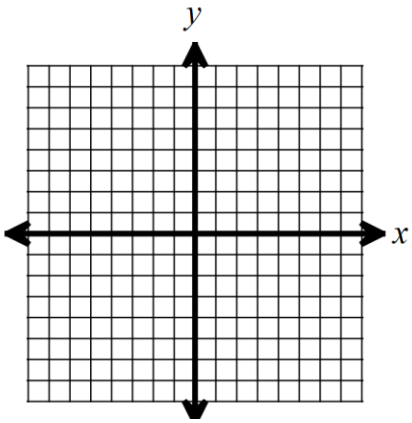
Vertex: _____

11. $y=-|x-5|+2$



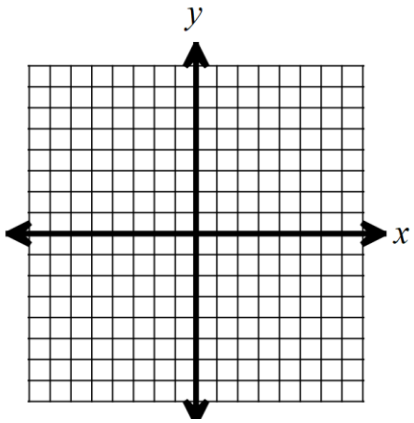
Vertex: _____

e. $y=-|x|-2$



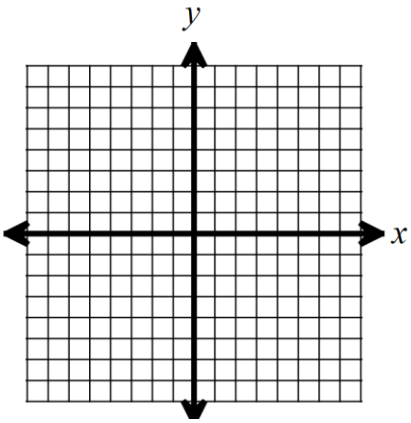
Vertex: _____

12. $f(x)=\frac{1}{2}|x+1|+4$



Vertex: _____

f. $f(x)=-0.5|x-2|-3$



Vertex: _____

Day 8 – Domain and Range

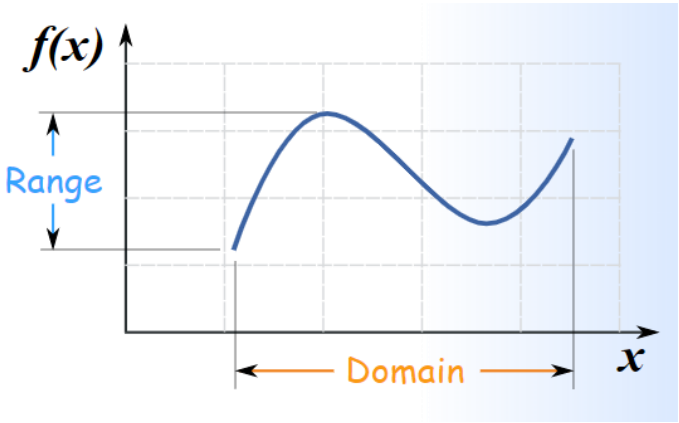
Objectives: SWBAT state the domain and range from a set of points.
SWBAT state the domain and range from a graph.

Domain – the set of input values for a function

Think left to right

Range – the set of output values for a function

Think bottom to top



Find the domain of the following sets of points.

1. $\{(3,-5),(5,-6),(-10,5),(2,0)\}$

Domain: _____

Range: _____

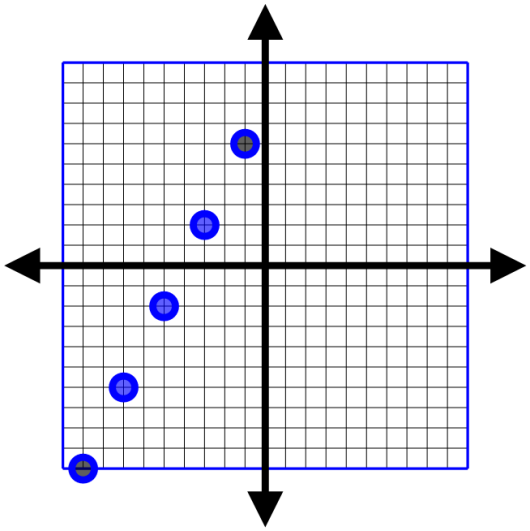
a. $\{(-5,7),(2,3),(3,3),(-5,-5)\}$

Domain: _____

Range: _____

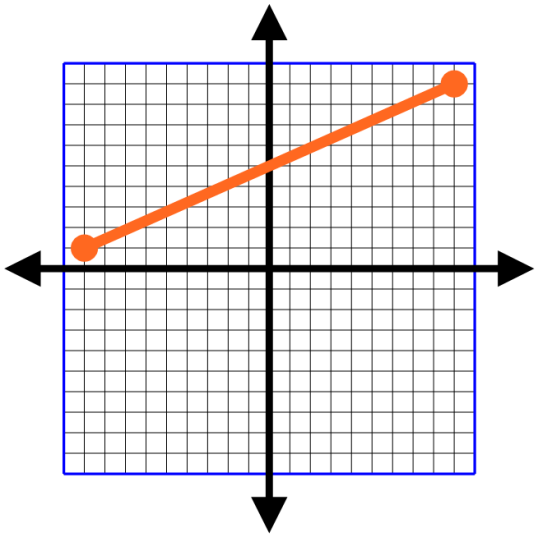
Find the domain and range of each graph.

3.



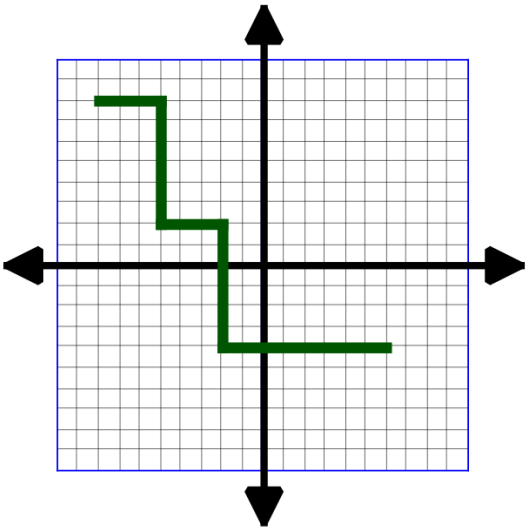
Domain: _____ **Range:** _____

4.



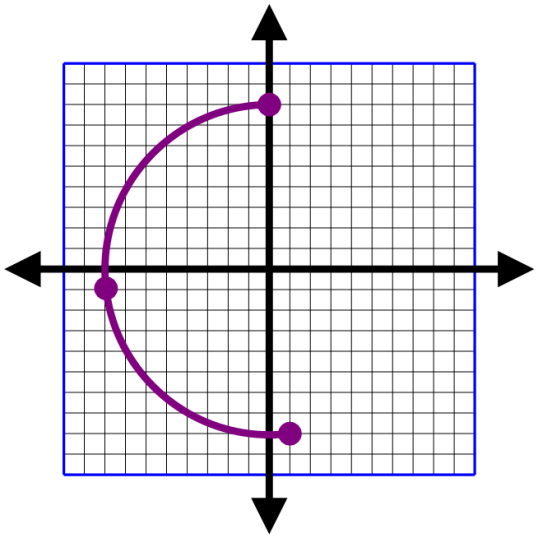
Domain: _____ **Range:** _____

b.



Domain: _____ **Range:** _____

5.



Domain: _____ **Range:** _____

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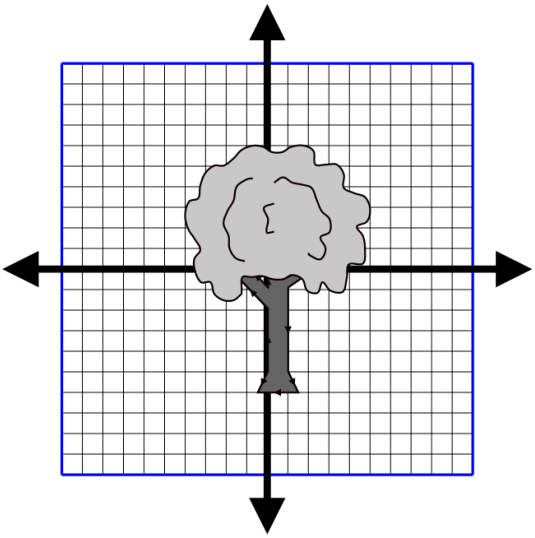
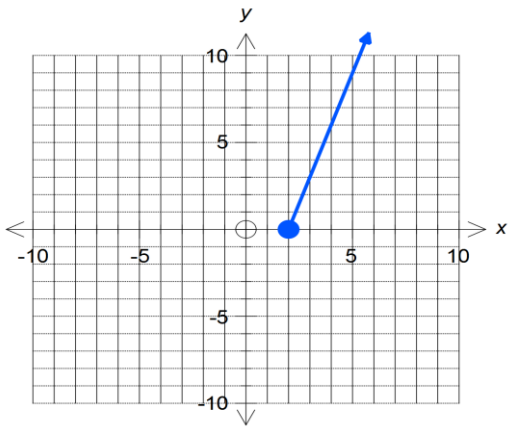


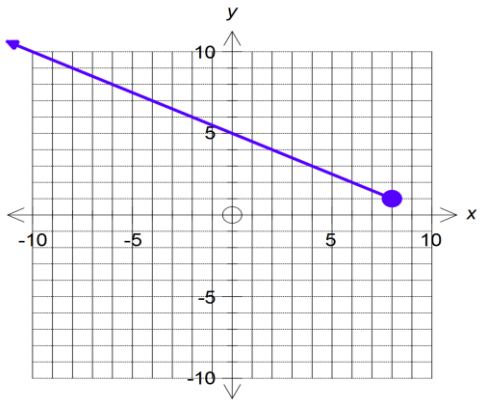
Domain: _____ **Range:** _____

6.



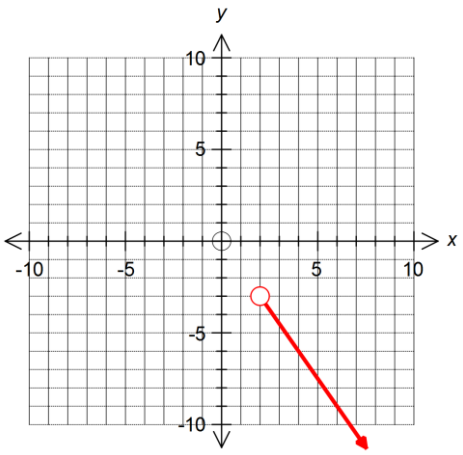
Domain: _____ **Range:** _____

7.



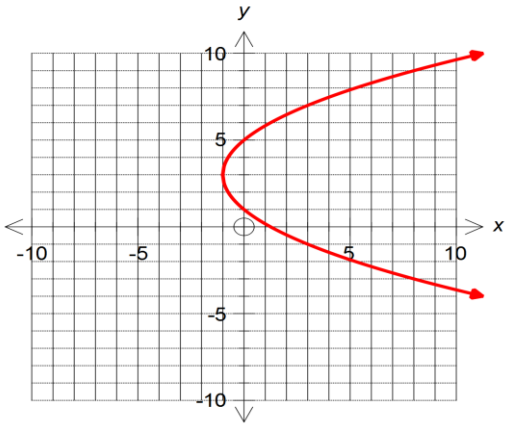
Domain: _____ **Range:** _____

d.



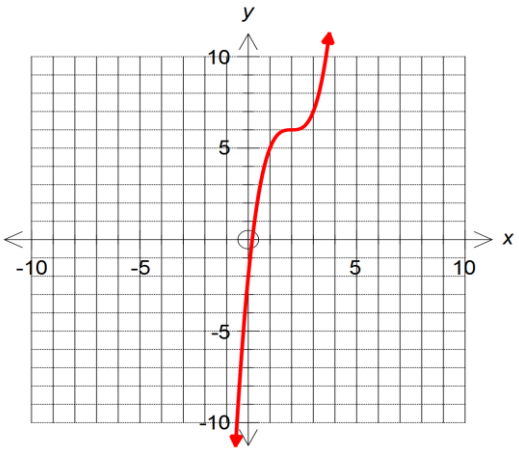
Domain: _____ **Range:** _____

8.



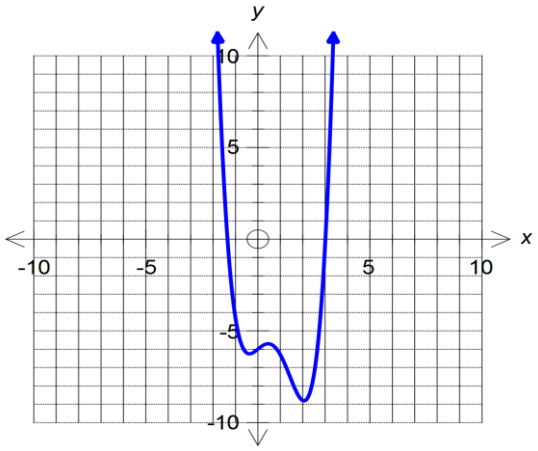
Domain: _____ **Range:** _____

9.



Domain: _____ **Range:** _____

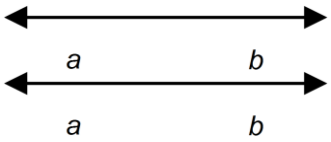
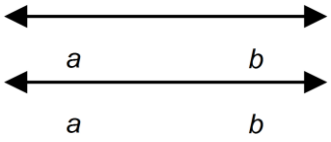
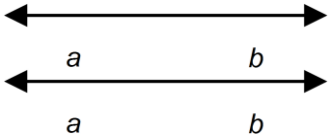
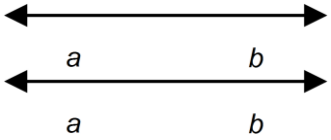
10.



Domain: _____ **Range:** _____

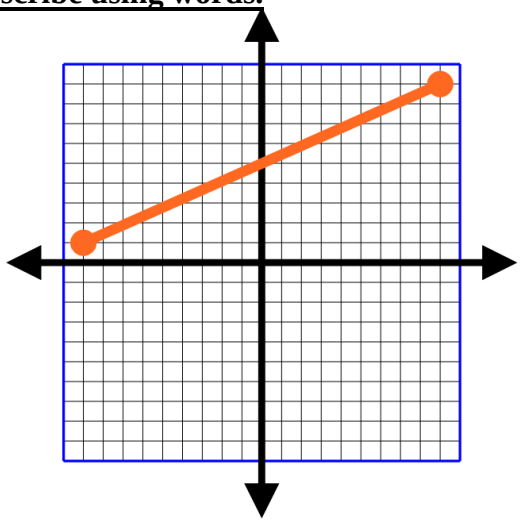
Day 9 – Notation

Objective: SWBAT write domain and ranges in set, interval, and inequality notation

	Words	Inequality Notation	Set Notation	Interval Notation	Graph
Open Interval	A set of numbers greater than *a* and less than *b*				
Closed Interval	A set of numbers greater than or equal to *a* and less than or equal to *b*				
Infinite Interval (Positive)	A set of numbers where *x* is greater than *a*				
Infinite Interval (Negative)	A set of numbers where *x* is less than or equal to *b*				

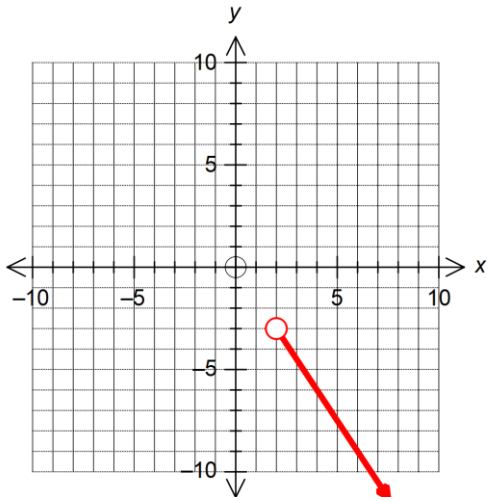
Given the following graph, write the domain and range in inequality, set, and interval notation. Also, describe using words.

1.

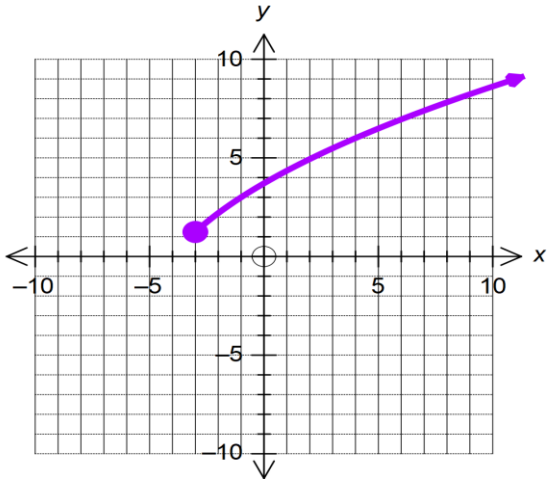


	Inequality	Set	Interval
D			
R			

2.

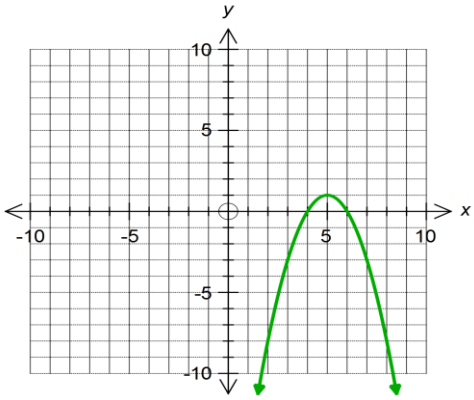


	Inequality	Set	Interval
D			
R			



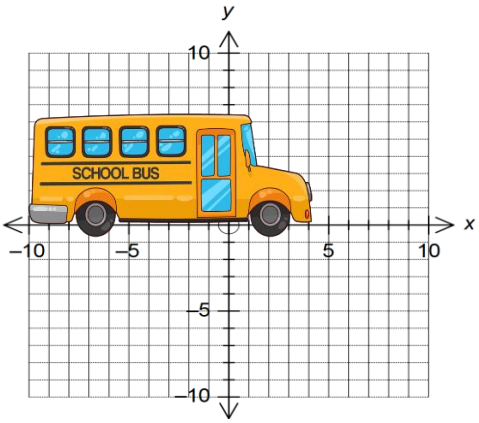
	Inequality	Set	Interval
D			
R			

4.



	Inequality	Set	Interval
D			
R			

a.



	Inequality	Set	Interval
D			
R			

Day 10 – Piecewise Functions – Restricted Domains

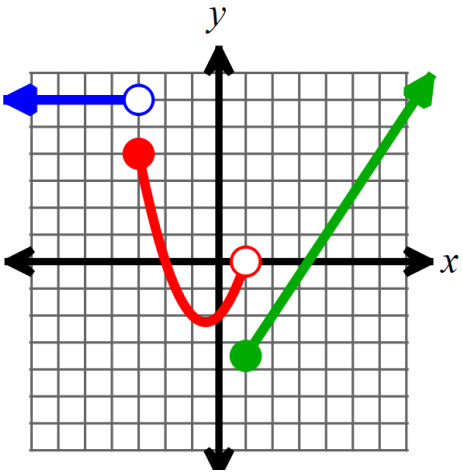
Objectives: SWBAT graph functions with restrictive domains
SWBAT evaluate piecewise functions

Piecewise Function – a function built from the pieces of different functions

Closed Dot – includes that endpoint

Open Dot – does not include that endpoint

Restricted Domains – functions during a specific interval or domain



Evaluating the piecewise functions given the following domains

$$g(x)=\begin{cases}2x-1, & if\ \ x\le 1\\ 3x+1, & if\ \ x>1\end{cases}$$

1. $x=-4$ **2.** $g(5)$ **3.** $g(-1)$ **a.** $x=-3$

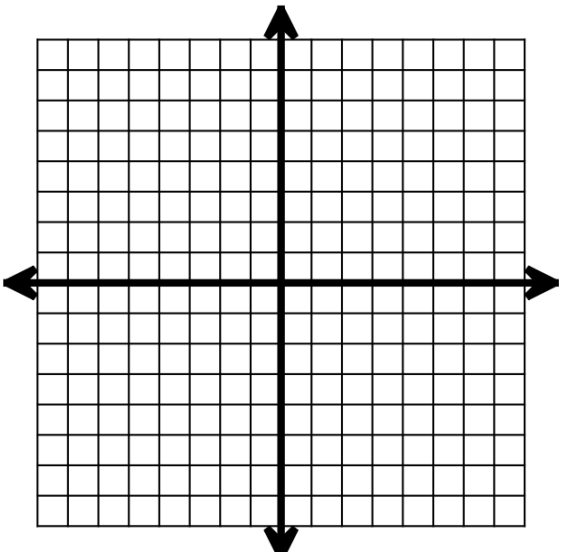
Evaluate the function *f*(*x*) for the following values.

$$f(x)=\begin{cases}-\frac{3}{2}x-1, & if\ \ x<-2\\ x+1, & if\ \ -2\le x<1\\ 3x^2, & if\ \ x\ge 1\end{cases}$$

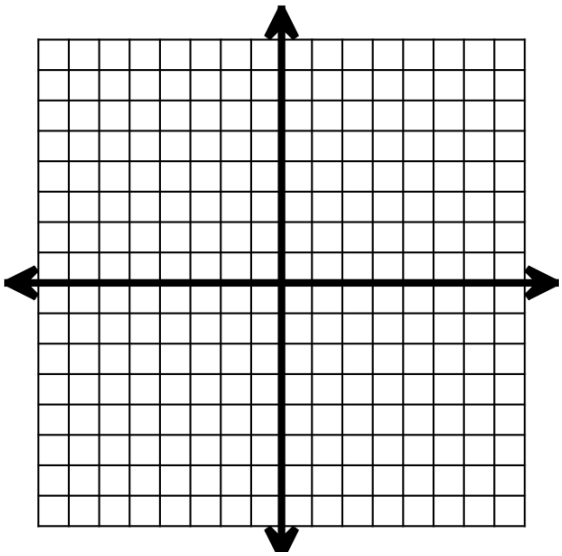
4. $x=0$ **5.** $f(-8)$ **c.** $f(-2)$ **d.** $f(10)$

Graph the following functions:

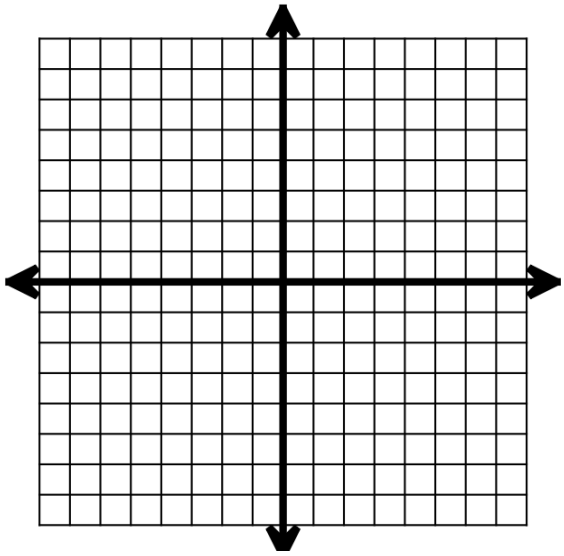
8. $f(x) = \{2x - 1, \quad if \ x \le 1$



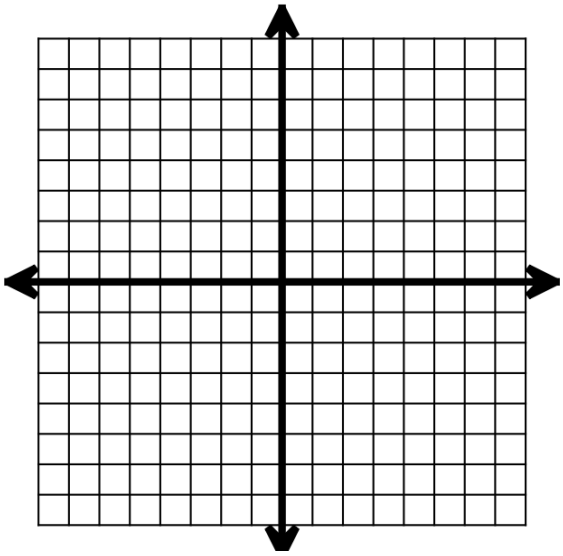
9. $f(x) = \begin{cases} -\frac{3}{2}x - 1, & if \ x > -2 \end{cases}$



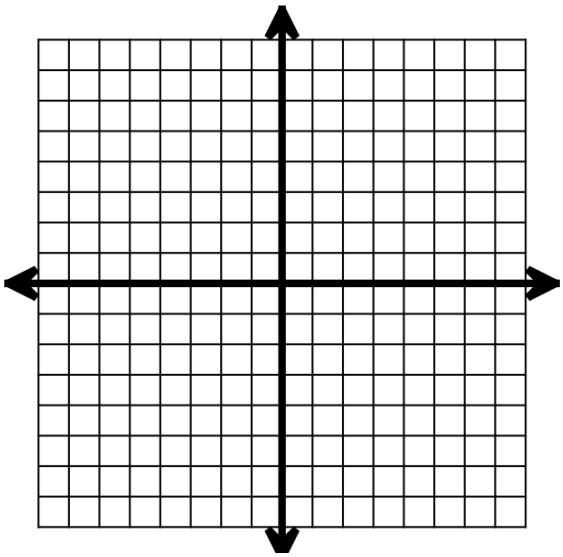
d. $g(x) = \{4x - 3, \quad if \ x > 2$



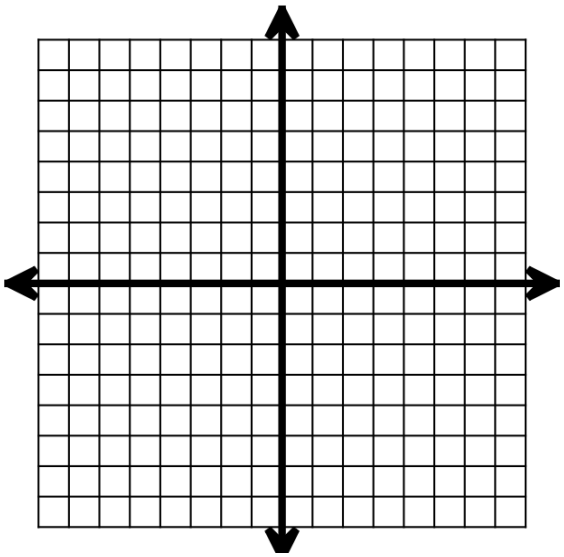
10. $f(x) = \{-x + 7, \quad if \ -3 < x \le 2$



11. $f(x)=\begin{cases} -\frac{1}{3}|x|+5 & \text{if } 1\le x\le 6 \end{cases}$



12. $f(x)=\begin{cases} \frac{1}{2}|x-5|, & \text{if } x\ge -3 \end{cases}$

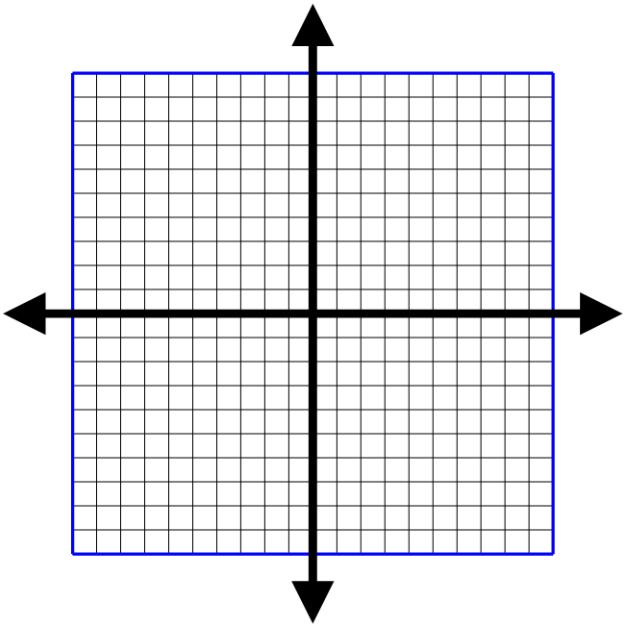


Day 11 – Piecewise Functions – Day 2

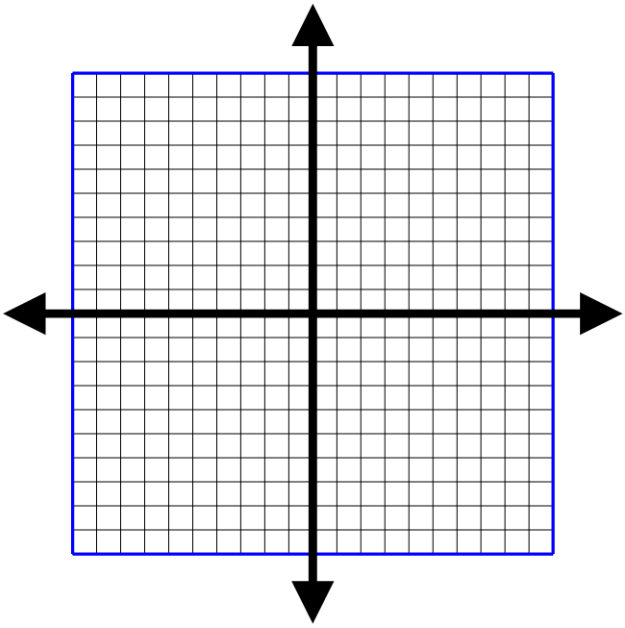
Objectives: SWBAT graph piecewise functions

Graph the following piecewise function.

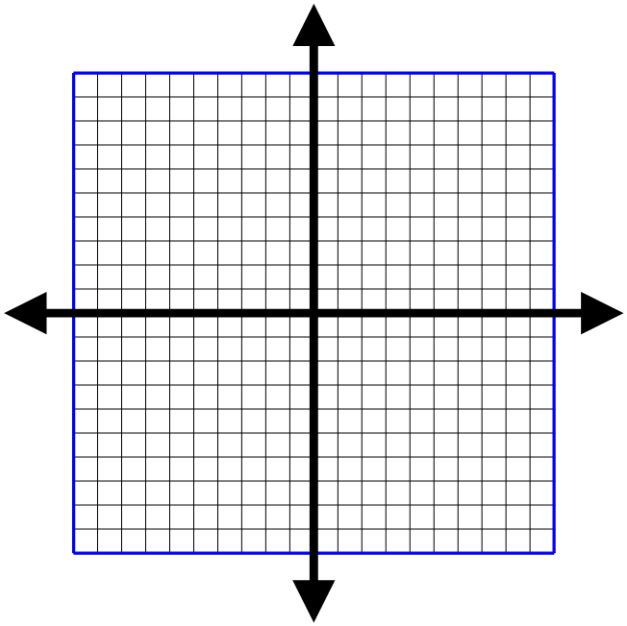
1. $f(x)=\begin{cases} 2x+3, & x\le 1 \\ 3x-5, & x>1 \end{cases}$



2. $g(x)=\begin{cases} 5+3x; & \text{if } x\le -2 \\ -2x-2 & \text{if } x>1 \end{cases}$



3. $h(x)=\begin{cases} -x, & if\ \ x<-2 \\ 6, & if\ -2\le x<3 \\ -\frac{1}{3}x-1, & if\ \ x\ge 3 \end{cases}$



4. Write a piecewise function for the graph below.