Secondary 1 Term 2

Text & Reference Manual

Name: ____

Teacher: ________________ Class Period:______________

Term 2: October 24th—December 20

Study Guide Grades	
Unit 4 Study Guide Graphing Systems Due: 10-31/11-1	
Unit 5 Study Guide Solving Systems Due: 11-29/30	
Unit 6 Study Guide Features of Functions Due: 12-11/12	

Please review the following policies for Secondary One:

- Students must pass every Essential Mastery Test (EMT) with an 80% or better in order to receive a passing grade.
- Practice tests for EMT's are **available online** to help prepare for the tests.
- Student may retake any EMT as many times as necessary to show understanding of the essential standards in the core.
- Any failing grade can be made up to a passing grade until the last week of term
- Students may take missing tests after the end of any term as needed.
- A failing grade must be made within one term to earn a grade higher than a D-.
- Traditional textbooks are available upon request but may not align with class content.
- Unless there are extenuating circumstances, term finals may not be retaken for a higher score.
- Homework turned in after the due date will receive a penalty to credit unless excused by the teacher because of absence or other extenuating circumstances.
- Each term includes a final date when homework will no longer be accepted for credit.
- If a student damages a class-provided calculator (TI-84) a fee of $90 will be added to school fees and the student will no longer will have access to a school calculator.
- If a student damages a class-provided iPad a fee of $450 will be added to school fees and the student will no longer will have access to another calculator.
- The student will complete the study guides included in this packet as part of the homework requirement:

SECONDARY MATH 1 SCOPE AND SEQUENCE 2016-2017 (TERM TWO)
****SUBJECT TO CHANGE****

TERM 2: Oct 24 – Dec 20

UNIT 4 – Graphing Inequalities					
Assn	**Learning Objective**	**A Day**	**B Day**	**Done**	**Core Std**
4A	Graphing Inequalities	Oct-16	Oct-17		A.REI.7
4B	Inequality Word Problems and Linear	Oct-18	Oct-24		A.REI.7
4C	Systems of Inequalities	Oct 25	Oct 26		A.REI.7
4R	Unit 4 Review	Oct 27	Oct 30		
	Unit 4, Inequalities TEST	Oct 31	Nov 1		

UNIT 5 – Systems of Equations					
Assn	**Learning Objective**	**A Day**	**B Day**	**Done**	**Core Std**
5A	Systems of Inequalities	Nov-2	Nov-3		
5B	Solving by Graphing and Estimating Solutions	Nov-6	Nov-7		A.REI.6, A.REI.12, A.CED.3
5C	Setting Equal	Nov-8	Nov-9		A.REI.5
5D	Substitution	Nov-10	Nov-13		A.REI.5
5E	Elimination	Nov-14	Nov-15		A.REI.5
5F	Systems: Word Problems	Nov-16	Nov-17		SI.MP.5, A.REI.6
5G	Systems: More Practice	Nov-20	Nov-21		
	Thanksgiving Break (November 22-26)				
5R	Systems: Review	Nov 27	Nov-28		
	Unit 5, System of Equations TEST	Nov 29	Nov 30		

UNIT 6—Features of Functions					
Assn	**Learning Objective**	**A Day**	**B Day**		**Core Std**
6A	Function Rules	Dec 1	Dec 4		F.IF.1, F.IF.2
6B	Domain & Range	Dec 5	Dec 6		F.IF.1, F.IF.5
6C	Max and Min	Dec 7	Dec 8		F.IF.1
6R	Unit 6 Review/Test	Dec 11	Dec 12		
	Term 2 Final Review	Dec 13	Dec 14		
	Term 2 Final (DEAD Day is the day of the term final)	Dec 15	Dec 18		
	Christmas Break (Dec. 20-Jan. 3)				

END OF TERM DECEMBER 20

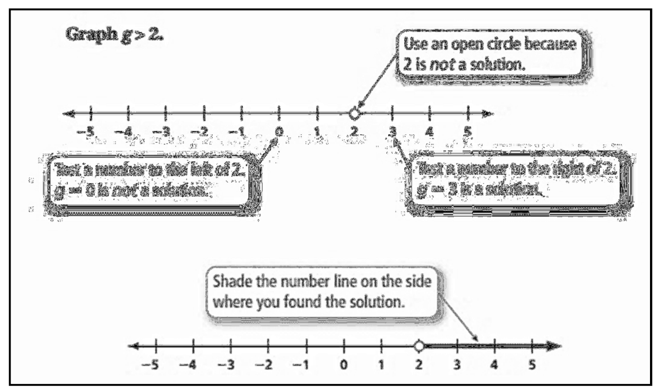
Unit 4 Linear Inequalities

SHOW YOUR WORK FOR FULL CREDIT. NO WORK, NO CREDIT. NO WORK IN PEN.

Targets	Sample	Ugh	Meh	Yeah	Assn
Graph the solution set of an inequality with 2 variables	x + y < 1				4B
Graph the system of inequalities.	$\begin{cases} y > \frac{3}{5}x + 3 \\ y \le -\frac{3}{5}x + 3 \end{cases}$				4B
Write and solve system of inequalities from a story problem	Sara made more than \$50 selling \$5 pies and \$8 cakes. Jana made less than \$100 selling the same pies and cakes. What graph would show them selling the same number of pies and cakes?				4A, 4B
Approximate solution sets by looking at a graph	By looking at the graph, approximate the solution of the graphs.				4A, 4B
Solve and find the solution set (Graph) with 1 variable on a coordinate grid.	2(x + 5) + 2 < 1 + x				4A, 4B

Graphing Inequalities on a number line.

- Use a closed circle, when the ___________ can be equal to the variable. ______ or $\le$ is used in an inequality.
- Use an open circle if the answer is not part of the ________________ set. Use the symbol > or ______.



Graphing Inequalities on a coordinate plane.

Step 1: Graph the line the same as an equation.

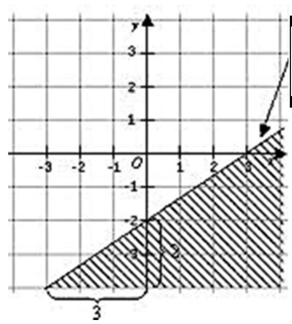
a. If an inequality sign states that the variable could be equal to the answer ($\le$ or $\ge$), the line will be ____________.

b. If an inequality states that the variable will be less or more than the answer and **NOT** equal to (< or >), the line will be ____________.

Step 2: Shade the proper side of the line.

Shading--DO NOT USE THE GREATER/ LESS THAN SIGN TO DETERMINE WHERE TO SHADE.

Example: $y \le \frac{2}{3}x - 2$



The boundary line is solid because it is $\le$.

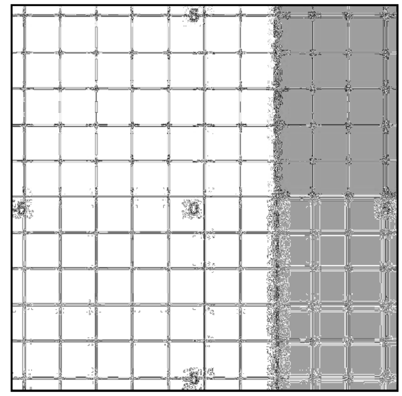
Note that when we test (0, 0), we get $0 \le \frac{2}{3}(0) - 2$. Because 0 is **NOT** less than –2, shade the side that **DOES NOT** contain (0, 0).

The **(0, 0) Test** (or any point) will help determine where to shade. After drawing the ____________ (whether dotted or solid), plug a point like (0, 0) into the inequality.

For example, given 2x + 5 > y, plug in (0, 0) to get 2(0) + 5 > 0. The inequality is true, so the side of the line that contains (0, 0) is _______________. If the inequality is incorrect, (like $0 \ge -3(0) + 3$ then the side of the line that does not contain (0, 0) is _______________.

If the point (0, 0) lies on the line, perform the test with a different point on either side of the __________..

To graph $x > 2$ on a coordinate plane, start with the number line and use a ________ for the boundary.



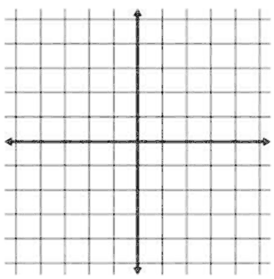
- Use a SOLID ________ when the solution can be **equal** to the variable (≥ or _______.
- Use a DOTTED line if the answer is not part of the _________________ set. Use ≤ or _______ in the inequality.

Give two differences between the graphs of $x > 2$ and $y \geq 2$

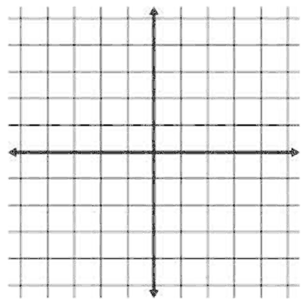
- ____
- ____

Graph the solutions to the inequalities below.

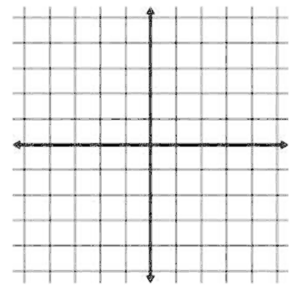
$y \leq \frac{2}{3}x + 6$



$4x + 2y \leq 8$



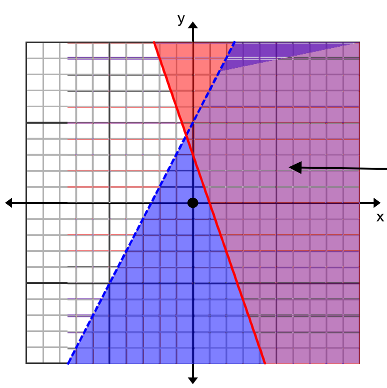
$y \leq 9x + 12$



Systems of Inequalities

A system of inequalities has two or ___________ inequalities graphed on the same grid. The solution set contains the points that are double ________________.

Example: $\boldsymbol{y \leq 2x + 5}$ **and** $\boldsymbol{y \geq -3x + 3}$



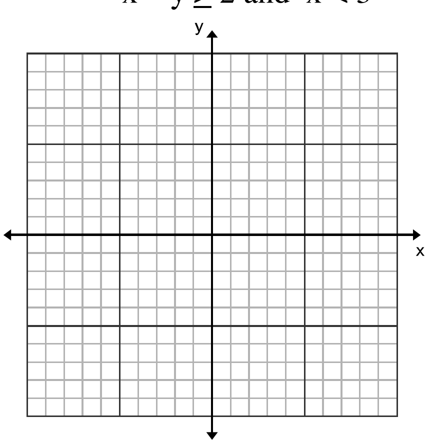
Graph the equations on the grid from y = mx + b, from a table, or from finding the intercepts.

The solution set includes ALL the points that are double shaded.

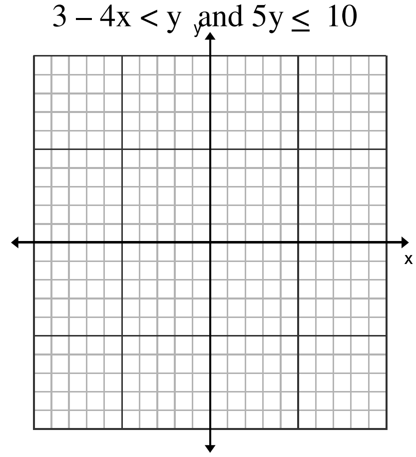
(0, 0) **IS** a solution to the first inequality. Shade on the side of (0,0).
(0, 0) **IS NOT** a solution to the second inequality. Shade on the other side of the line.

Graph the following systems of inequalities and **circle** are in the solution set.

x – y ≥ 2 and x < 3



3 – 4x < y and 5y ≤ 10



5SG Systems of Equations Study Guide

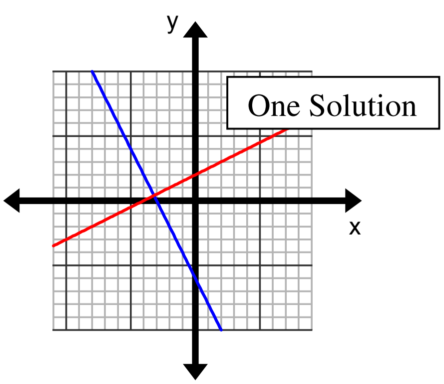
SHOW YOUR WORK FOR FULL CREDIT. NO WORK, NO CREDIT. NO WORK IN PEN.

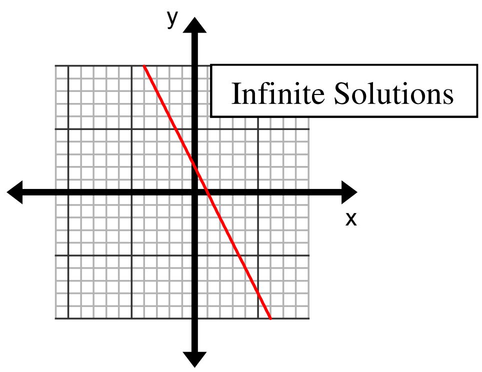
Targets	Sample	Ugh	OK	Yep!	Assn
Approximate solutions by looking at a graph.	By looking at the graph, approximate the solution of the graphs.				5A
Find solution(s) from a system of equations by setting equal/substitution	Solve the system of equations by setting them equal to each other. y = x + 8 AND 2x + y + 10 = 0 or x + y = 3 AND x = 2y				5A, 5B, 5R
Find solution(s) from a system of equations by elimination	Use elimination to solve the following system of equations: x + y = 13 AND x – y = 5				5C, 5R
Be able to explain the number of solutions a system has.	How many solutions does the following equations have and how do you know.				5A, 5R
Set up a system from a word problem.	Alex bought 3 tacos and 4 drinks at Amigo Bell for $16.50. If Sue bought 6 tacos and 2 drinks for $22.50, what is the cost of the tacos and drinks.				5D, 5R

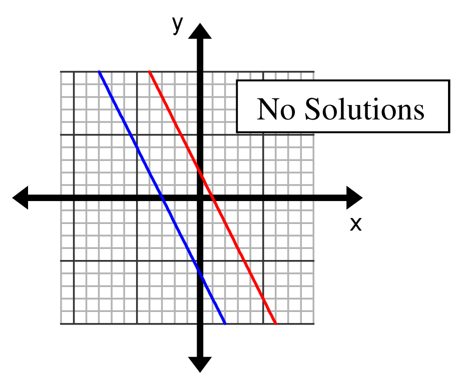
- A system has more than one ___________________.
- Systems can be for inequalities or for ___________________.
- Systems of equations means to find where two different equations have the _________ answer (or cross on a grid). Linear ______________ have two variables and both ______________ have the same value.

Number of Solutions

- **NO SOLUTION**: the equations have the same ___________ and different y-intercepts**.**
- **INFINITE SOLUTIONS:** the equations simplify to be the _________ equation. They will have the same slope and same _________________. (They intersect an infinite number of times.)
- **ONE SOLUTION:** the equations have different _____________.







Arrange the equations to show how many solutions each system has. Then tell how you know.

$\begin{cases} x + 2y = -5 \\ 5x + 25 = -10y \end{cases}$

$\begin{cases} y = -4x + 25 \\ 24x + 6y = 11 \end{cases}$

$\begin{cases} x + 2y = -5 \\ x - 6y = 11 \end{cases}$

______________________ ______________________ ______________________

______________________ ______________________ ______________________

Solve by Setting Equal

Find a solution for $8x + 16y = -24$ *and* $x - y = 9$.

Step 1. Solve both equations for the same ________________. (The variable must be written with a co-efficient of ____.)

Step 2. Since the two equations are equal to the same variable, set them _____________ to each other. Solve the new _______________.

Step 3. Plug this value into either original equation to get the other half of the _________________ point. (Since we know that y = –4, we can put that into either equation. The second equation is the easiest, so I used that one.)

1

$8x + 16y = -24$
$-16y = -16y$
$8x = -16y - 24$
$\frac{8x}{8} = \frac{-16y - 24}{8}$
$x = -2y - 3$

$x - y = 9$
$+y = +y$
$x = y + 9$

2

$-2y - 3 = y + 9$
$+2y = +2y$
$0 \quad -3 = 3y + 9$
$-9 = -9$
$-12 = 3y$
$-12/3 = 3/3y$
$-4 = y$

3

$x - y = 9$
$x - (-4) = 9$
$-4 = -4$

So, the "solution" is (5, –4). This is the only ______ that the two equations have in common. Double check the answer by plugging the point $(5, -4)$ into **BOTH** equations.

Solve the following by **Setting Equal**

$\begin{cases} y = -5x + 2 \\ y = 2x - 11 \end{cases}$

$\begin{cases} x + 2y = -5 \\ x - 6y = 11 \end{cases}$

$\begin{cases} 4x + 2y = -20 \\ x - y = 2 \end{cases}$

Solving by Substitution

Find a solution for $\begin{cases} 8x + 16y = -24 \\ x - y = 9 \end{cases}$

Step 1. Solve one of the equations for one ________________.

Step 2. Plug that answer into the other ___________ and solve for the variable.

Step 3. Plug that number into either equation and solve for the other ___________________.

Step 4. List the answer as a __________________ point.

Step 5: CHECK by plugging the point into ________ equations.

1

$x - y = 9$
$+y = +y$
$x = y + 9$

2

$8x + 16y = -24$
$8(y + 9) + 16y = -24$
$8y + 72 + 16y = -24$
$24y + 72 = -24$
$-72 = -72$
$24y = -96$
$24 = 24$
$y = -4$

3

$x - y = 9$
$x - (-4) = 9$
$x + 4 = 9$
$-4 = -4$
$x = 5$

4

(5, –4)

Use SUBSTUTION to solve the following equations.

$\begin{cases} x + 6y = 15 \\ -x + 4y = 5 \end{cases}$

$\begin{cases} 2x + 3y = -5 \\ -x + y = 5 \end{cases}$

$\begin{cases} 3x - y = 30 \\ x + y = 14 \end{cases}$

Solve by Elimination

Solve the following system: $\begin{cases} 5x + 3y = -8 \\ 2x + 3y = 4 \end{cases}$

Step 1: Align the equations with the variables and ______________ in the same order.

Step 2: If necessary, multiply the one or both of the equations to make ONE of the variables have **inverse coefficients** (same number but one positive and one _____________). Add the two equations to eliminate that ______________. (Add them to equal zero.) Solve for the remaining variable.

Step 3 Plug that number into either equation and solve for the other ___________________.

Step 4. Check the solution by plugging the x and y into _________ equations.

1

$5x + 3y = -8$
$2x + 3y = 4$

2

$5x + 3y = -8$
$-[2x + 3y = 4]$
$5x + 3y = -8$
$2x - 3y = -4$
$3x + 0 = -12$
$\frac{3x}{3} = \frac{-12}{3}$
$x = -4$

3

$2(-4) + 3y = 4$
$-8 + 3y = 4$
$+8 \quad = +8$
$\frac{3y}{3} = \frac{12}{3}$
$y = 4$

4

(–4, 4)

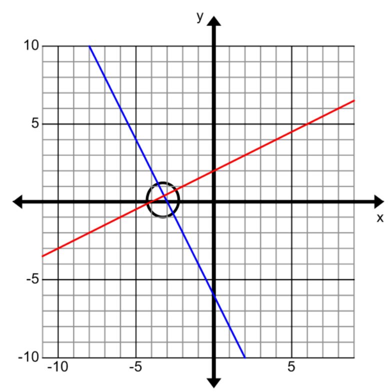
Use ELIMINATION to solve the following.

$\begin{cases} -x + 4y = 3 \\ x + 2y = 9 \end{cases}$ $\begin{cases} 2x - 3y = 1 \\ 2x + 3y = -5 \end{cases}$ $\begin{cases} 3x + 2y = 10 \\ 5x + 2y = 14 \end{cases}$

Solve by Graphing.

(See Unit 1 Study Guide for How to Graph Equations)

Graphing gives a **good estimate** of the solution set.

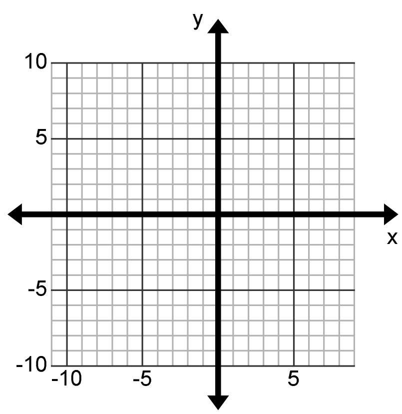


Step 1: Graph the two _________________. See where they intersect. This is the ______________. (This is an estimate, but it should be very close to the true solution.)

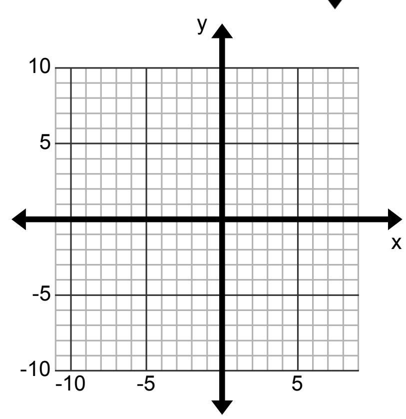
Step 2: Check the solution algebraically with one of the _______________ above.

Solve the following by graphing. Use the method below the graph to check your work. Explain why that method would be best for that problem.

$\begin{cases} 2x + y = 5 \\ 3x - y = 10 \end{cases}$



$\begin{cases} x + 2y = -5 \\ x - 6y = 11 \end{cases}$



Elimination:

Substitution:

Explain why that method would be best for each of the problems above.

Unit 6 Features of Functions SG

Targets	Sample	Ugh	Help	Got it	Assn
Identify discrete and continuous data.	Tell whether the following graph is continuous or discrete and explain why.				6A, 6R
Proper use of function notation.	Given $f(x) = \frac{1}{2}x - 1, find\ f(2)$. What is $f(x) = 3$?				6B, 6R
Write maximum and minimum using proper notation.	Given the table and graph, give the max and min of the data using proper notation				6C, 6R
Identify domain and range using proper notation.	Given the table and graph, give the Domain and Range of the data using proper notation				6B, 6R
Identify a function from a graph, table and story problem	Justify why this story represents a function or not.				6A, 6R
Recognize whether a function increases or decreases over an interval.	Over the given interval, explain where the graph/table/story increases or decreases, or neither.				6A, 6B, 6C, 6R

Vocabulary

Function: ____

Discrete: ____

Continuous: ____

Domain: ____

Range: ____

Increasing: ____

Decreasing: ____

Maximum: ____

Minimum: ____

Interval: ____

Function

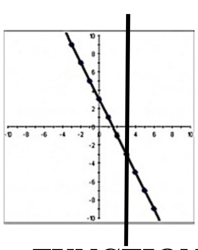
A function is a rule (math sentence) that has only one answer (output) for each x (____________). The following relation IS a function: {(9, 0), (8, −1), (3, 1), (7, 2)}. There is ONE output (y) for each input (x). The following relation is NOT a function: {(3, 1), (7, −5), (3, 0), (5, 4)}. There are TWO different y values (____________) for the input of 3.

Given {(7, −2), (5, −4), (3, 2), (7, 2)}, is this relation a function? ______ Explain why or why not___________________

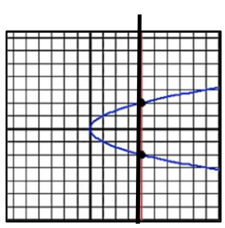
____

To check if a graph is a _______________, use the **vertical line test**. The vertical line test shows that if a vertical line intersects the graph more than once, then the relation is **NOT** a ________________.

a.



FUNCTION



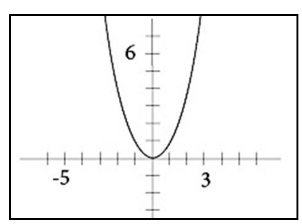
b.

NOT A FUNCTION-- Notice that when a vertical line is drawn acros the graph, it will _________ the graph twice in at least one place.

c. Is the following graph a function?________

Explain_________________________________

____

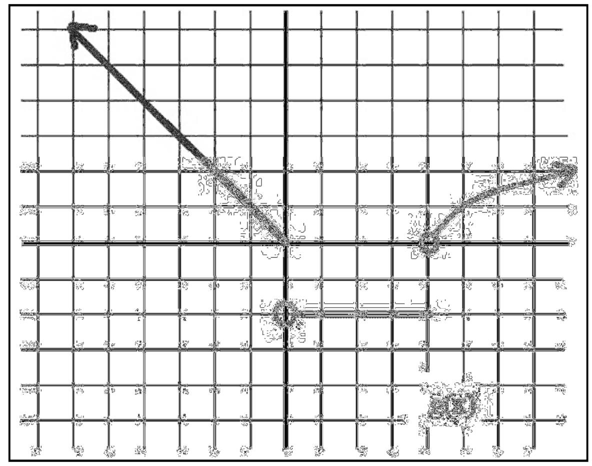


Function Notation

The use of *f(x)* only means that the math sentence is a _______________. It does ***NOT*** mean f times x. It means that every input (x) used will give only one ____________ (y). The notation *f(2)* means that the number in parentheses (__) will be used for x in that function to solve for ____. For example: If *f(x)* = 3x + 5 *f(4)* =3(4) + 5, so *f(4)* = 17.

Interval Notation ("From this x to this x")

Intervals consider only parts of a ___________. To consider the points from where x ≥ –5 to x = 0, write it with the notation [–5, 0]. To consider the points from where x > –5 to x = 0, write it with the notation (–5, 0].. The horizontal piece from 0 to 4 does not include the 0 but does include the 4, so the interval is written (0, 4]. If the interval starts or _________ at infinity, use parentheses. Why? ____



In the following graph at x = 0, it looks like the vertical line test would show that this is not a ________________. However, an open circles means the ____________ is NOT included, so the vertical line test still works and *g(x)* ____ a function.

Domain and Range

The domain is the set of all the x-____________ of the function. The range is the set of the ___ values. If the data are continuous, use Interval Notation (above). If the data are discrete, use set notation ({ }) to list the elements of the set.

The domain and range of a table (like a graph), are the input and _____________ values.

The domain of the **graph above** is (– ∞, ∞). The range is [–2, ______).

The domain of the **table right** is { –8, 1, 2, 14, 16, 21}. The range is {–2, 0, 1, 4, 7, 9}

x	*f(x)*
1	7
16	4
– 8	9
14	1
2	-2
21	0

Discrete and Continuous Data

Data are continuous when the _____________ is unbroken. Discontinuous data are graphed with a _____________. On the interval (domain) [–4, 0], the data above is _________________. On the interval [–4 to 3], the graph is broken showing that data are discontinuous. Data are **discrete** when the ______________ contains only points.

Real life situations can be described as continuous or discrete. The air we breathe throughout a day is ____________ (hopefully). While the numbers of people invited to a party are discrete (hopefully).

Increasing and Decreasing

A function "increases" when the slope is ______________. It "decreases" when the ___________ is negative. If the graph is not linear, consider the slope over an interval. On the graph above from (4, 8], the graph is _____________.

Write the interval where the graph is increasing? __________ Where it is decreasing? ___________Where would the **graph** not be either increasing or decreasing? __________ Explain: ____________________________________

At the point where a graph changes from increasing to decreasing (like a peak), parentheses are used instead of _______________ since the slope at that point would be zero.

Maximum and Minimum

The ________________ is the **point** with the highest output value (y) over an interval. The minimum is the ___________ with the lowest output value over an interval. In a table above, the max and min point(s) can be found by finding the highest *f(x)* value and the lowest *f(x)* ____________. The min point of the table above is (2, –2). Find the max._________

The linear function $f(x) = x - 2$ has no maximum or ___________________ because *f(x)* ranges from $(-\infty, \infty)$.