_____

First and Last Name

Units
3-4

Algebra

Name: _____ Score: ____ out of 70

Folder Check Algebra Unit #3

Name on all pages. _____

Pages 1-2 Worksheet Lesson 1 _____

Pages 3-4 Notes Lesson 1 _____

Pages 5-6 Worksheet Lesson 2 _____

Pages 7-8 Notes Lesson 2 _____

Pages 9-10 Worksheet Lesson 3 _____

Pages 11-12 Notes Lesson 3 _____

Pages 13-14 Worksheet Lesson 4 _____

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Pages 23-24 Notes Lesson 6 _____

Pages 25-26 Study Guide _____

Pages 27-28 Study Guide _____

Worksheet Policy

-0 All Questions Done

-1 More than Half Done

-2 Only Groupwork Q's

-3 Less than Half Done

-4 Blank/Absent

Notes Policy

-0 All boxes filled

-1 One Empty Box

-2 Two Empty Boxes

-3 Less than Half Done

-4 Blank/Absent

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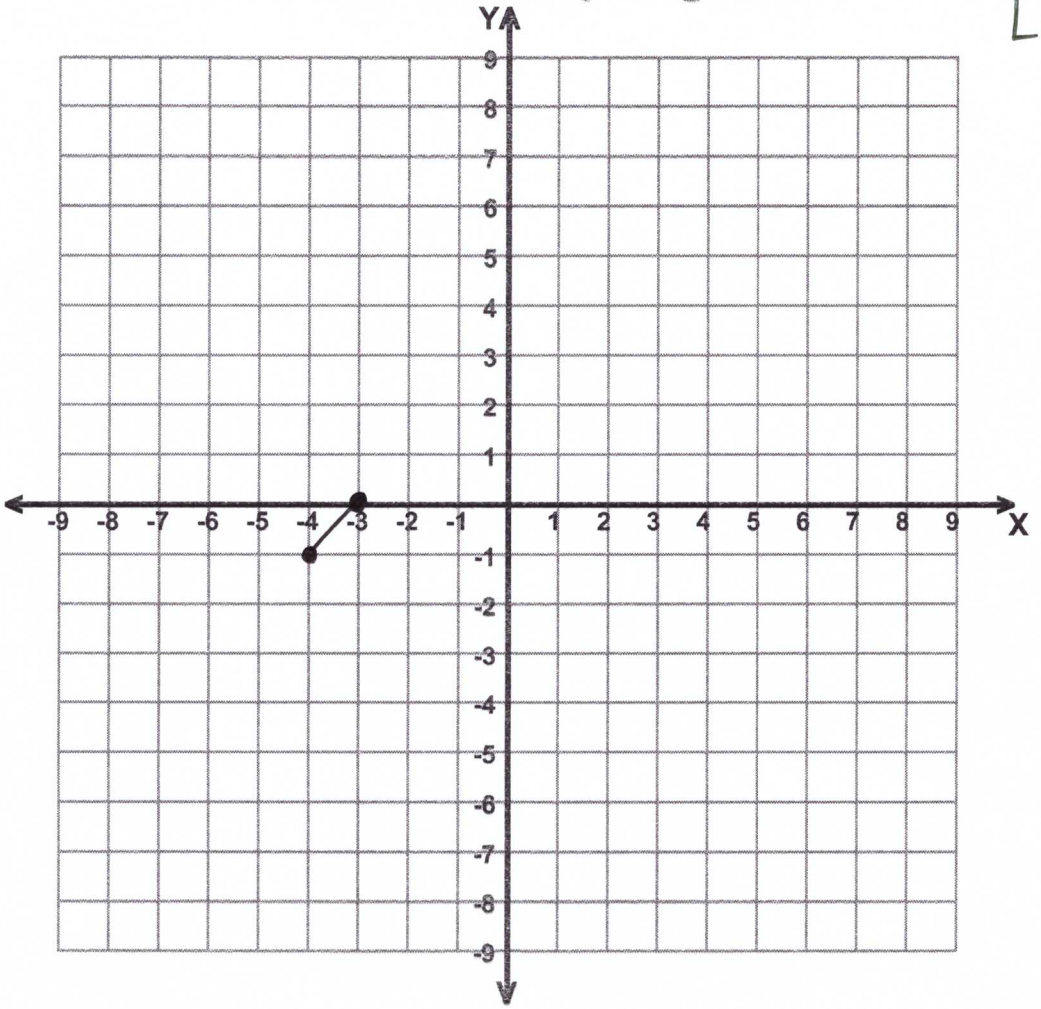
Name : _____ Score : _____

Teacher : Mr. VanScoyK (Mr.V) Date : Algebra 3.1

Four Quadrant Graphing Puzzle

Lesson #1



Connect each sequence of points with a line.

13. (-3,0) , (-4,-1) , (-6,-2) , (-6,-3) , (-5,-4) , (-4,-4) , (-3,-4) , (1,-2) End of Sequence Front of plane
14. (-1,1) , (5,3) , (6,5) , (7,5) , (7,3) , (9,2) , (8,1) , (6,2) , (3,-1) End of Sequence BACK of plane
15. (-5,-3) , (-6,0) , (-5,0) , (-5,-6) , (-4,-6) , (-5,-3) End of Sequence propeller
16. (-9,3) , (-7,4) , (7,-3) , (5,-4) , (-9,3) End of Sequence wings
17. (-6,-2) , (-4,-3) , (-2,-2) , (-1,-1) End of Sequence engine of the plane
18. (5,3) , (4,4) , (5,4) End of Sequence Passenger wing
19. (-4,-1) , (-2,-2) End of Sequence window

Did you make an airplane? _____

-1-

Algebra 1 Lesson 1
Function Notation Worksheet Alternate

Name: _____ Date: _____

For #1-8: Evaluate the following expressions given the functions below. Then, write the point.

multiply subtract divide Add

$g(x) = -3x$ $f(x) = x - 7$ $h(x) = \frac{16}{x}$ $j(x) = x + 4$

$g(10) = -3(10)$ $f(\ ) = (\ ) - 7$

$g(10) = -30$

1. $g(10) =$ -30 2. $(10, -30)$

3 $f(3) =$ ____ 4. $(\_\_, \_\_)$

5. $h(-2) =$ _____ 6. $(\_\_, \_\_)$

7. $j(7) =$ _____ 8. $(\_\_, \_\_)$

For #9-12: Translate the following functions into coordinate points.

9. $f(-1) = 3$ $(-1, 3)$ 10. $g(4) = -1$

11. $h(2) = 8$ $(\_\_, \_\_)$ 12. $k(2) = 9$

Name: _____ Unit # 3 Lesson # 1

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

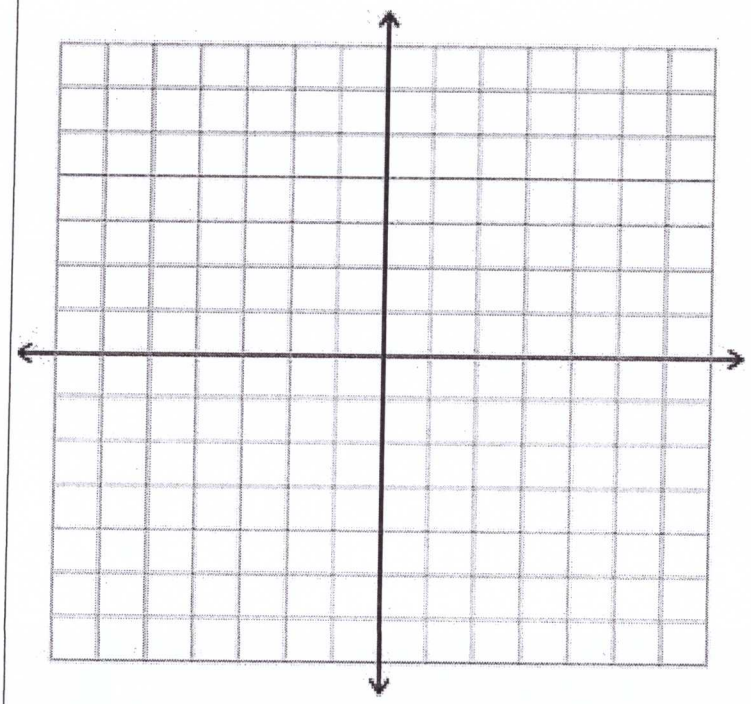
Unit # 3 Lesson # 1

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Name: _____ Date: _____

Algebra I
Function Notation with the calculator Unit 3 Lesson #2

1. Evaluate the following expressions given the functions below:

Subtract Multiply Add divide

$g(x) = x - 2$ $f(x) = 2x$ $h(x) = x + 2$ $j(x) = \frac{x}{2}$

a. $g(10) =$

b. $f(3) =$

c. $h(-2) =$

d. $j(8) =$

#2. A. $f(-1) =$

B. $h(-3) =$

C. $j(-4) =$

D. Find $g(10) + f(3) = 8 + 6 = 14$

#3. A. Find $h(-2) + j(-4) =$

B. Find $h(-3) + j(8) =$

#4. Translate the following statements into coordinate points:

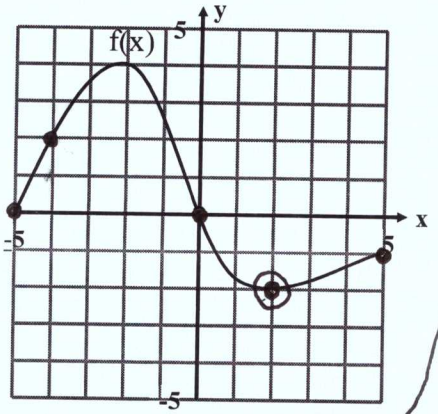
a. $f(-1) = 1$ $(-1, 1)$

b. $h(2) = 8$

c. $g(1) = -2$

Unit 3
Lesson 2

For # 5 use the graph to find:



a. $f(2) =$ -2

b. $f(0) =$ _____

c. $f(-4) =$ _____

D. $f(-5) =$ _____

E. $f(5) =$ ____

f. Does the graph represent a *function*? Explain why or why not.

x	y
-5	
-4	
0	
2	
5	

a normal table

Yes, the ___ values do not repeat.

#7. Swine flu is attacking Porkopolis. The function $S(x) = 2x$ determines how many people have swine after 1 day, 2 days, 3 days, ..., 8 days. Graph the points.

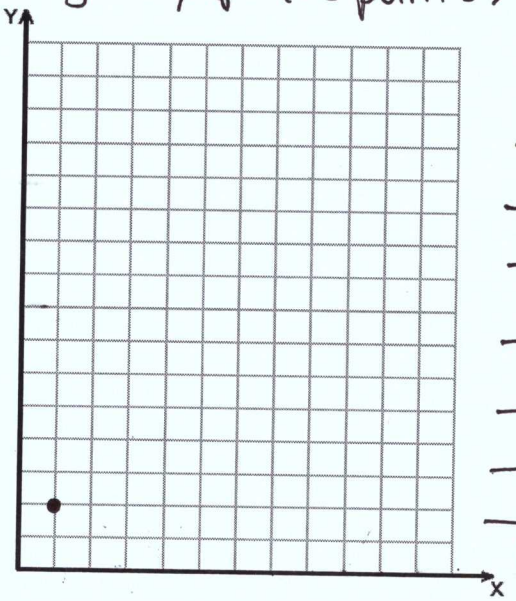
a. $S(1) =$ 2 (1, 2)

b. $S(2) =$ ____ (__, __)

c. $S(3) =$ ____ (__, __)

d. $S(4) =$ ____ (__, __)

e. $S(5) =$ ____ (__, __)



x	S(x)
1	
2	
8	

f. $S(6) =$ ____ g. $S(7)$ ____ h. $S(8) =$ ____

Name: _____ Unit # 3 Lesson # 2

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

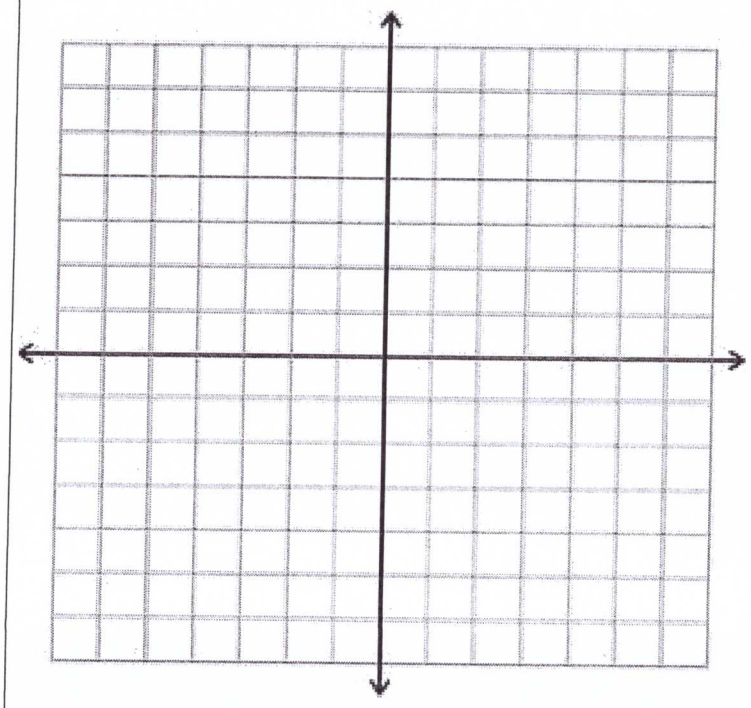
Unit # 3 Lesson # 2

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Function Notation & Evaluating Function NAME:_____

DATE:_____ PER:____

Lesson # 3 Unit #3

1. Given $f(x) = 2x + 3$. Fill in the table .

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

2. Given $g(x) = \frac{1}{2}x - 2$. Fill in the table .

x	$f(x)$
-2	
0	
2	
4	
6	

3. Evaluate the following expressions given the functions below:

$g(x) = -3x + 1$ $f(x) = x + 7$ $h(x) = \frac{12}{x}$ $j(x) = 2x + 9$

a. $g(10) = -3(10)+1$

$g(10) = -30 + 1$

$g(10) = -29$

b. $f(3) = (\ ) + 7$

c. $h(-2) = \frac{12}{(\ )}$

D. $j(4) = 2(\ ) + 9$

4. Translate the following statements into coordinate points.

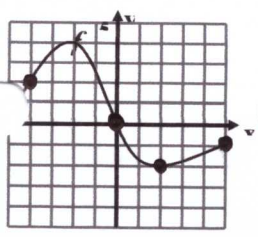
a. $f(3) = 10$ (3,10)

b. $g(10) = -29$ (—,—)

c. $h(-2) = -6$

d. $j(4) = 17$

5. Given this graph of the function f(x):



Find: a. $f(-4) =$ 2 write as a point (-4,2)

b. $f(0) =$ ___

c. $f(2) =$ ___

d. $f(5) =$ ___

Unit 3.3

Lesson #3

INTRODUCTION TO FUNCTIONS
COMMON CORE ALGEBRA I HOMEWORK

FLUENCY

6. Decide whether each of the following relations is a function. Explain your answer.

Input (x)	Outputs (y)
0	1
2	2
2	3

Function?

No, because the ___ value repeats. The $x=2$ has two outputs.

7. In each of the following examples, use an input-output chart to decide if the following relation is a function.

7(a) Consider the following relation:

$y = |x + 2$

Input (x)	Calculation	Output y=
-3	$(-3)+2$	$y=-1$
0		
6		

7(b) Consider the following table;

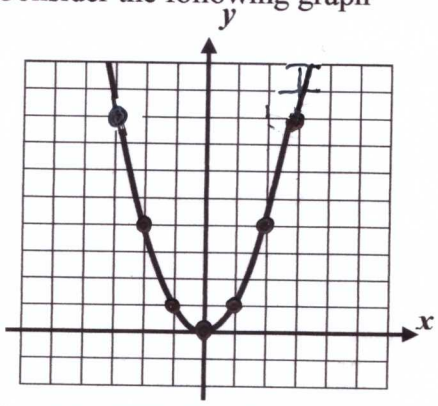
$y = -3x + 1$

Input x	Calculation	Output y
-2	$-3(-2)-1$	$y=7$
3		
0		

7(c) Function? Yes/No

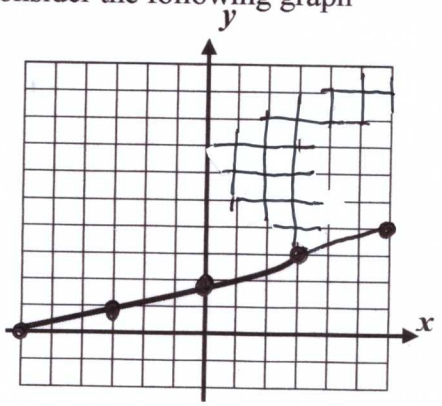
7(d) Function? Yes/No

8 (A) Consider the following graph



Input x	Calculation $y=x^2$	Output(s) y
-2	$(-2)^2$	$y=4$
1	$(1)^2$	$y=1$
2	$(2)^2$	$y=4$

8(B) Consider the following graph



Input x	Calculation $y=\frac{x}{3}+2$	Output(s) y
-6	$\frac{(-6)}{3}+2$	$y=0$
0		
3		

8(c) Function? (Yes)/No

8(D) Function? Yes/No

Name: _____ Unit # 3 Lesson # 3

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

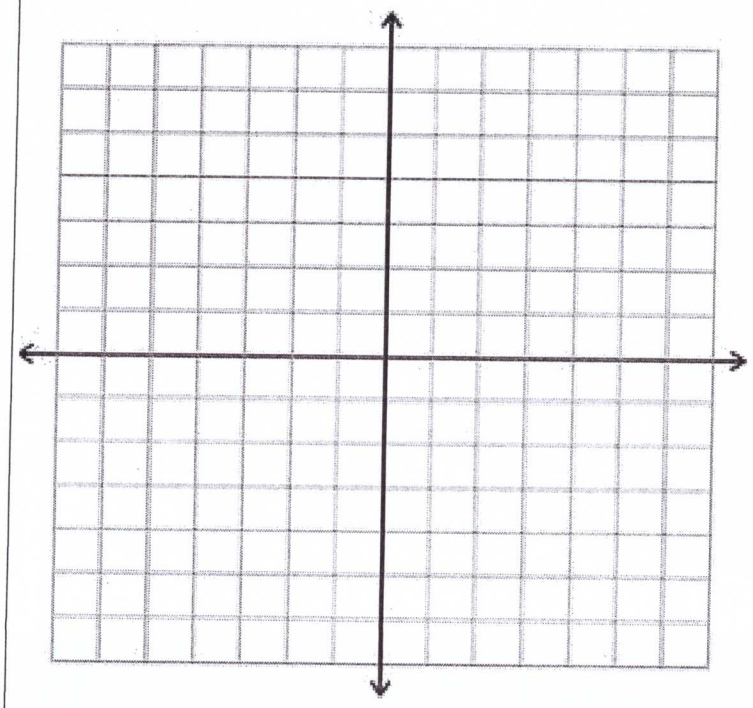
Unit # 3 Lesson # 3

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Name: _____ Date: Algebra

GRAPHS OF FUNCTIONS
COMMON CORE ALGEBRA I

Unit 3 Lesson 4

Graphs are one of the most powerful ways of visualizing a function's rule because you can quickly read **outputs** given **inputs**. You can also easily see features such as **maximum and minimum** output values. Let's review some of those skills in Exercise #1.

Exercise #1: Given the function $y = f(x)$ defined by the graph below, answer the following questions.

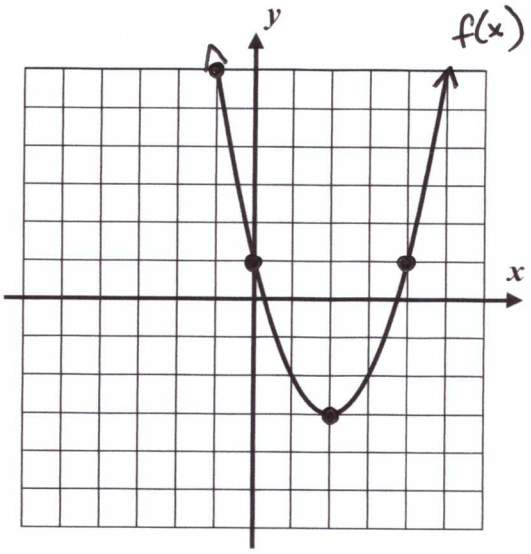
(a) Find the value of each of the following:

$f(4) =$ ____ $f(-1) =$ ____

(b) For what values of x does $f(0) =$ ____

(c) State the **minimum** (____ , ____) **of the function.**

↑ the bottom of the graph



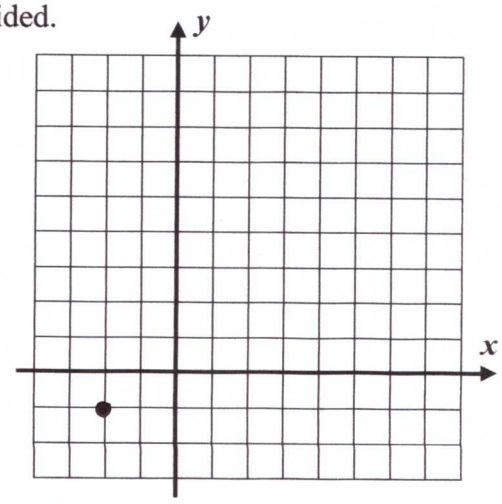
So, if we can read a graph to produce outputs (y-values) if we are given inputs (x-values), then we should be able to reverse the process and produce a graph of the function from its **algebraically expressed rule.**

Exercise #2: Consider the function given by the rule $g(x) = 2x + 3$.

(a) Fill out the table below for the inputs given.

x	$2x+3$	(x, y)
	↙ Substitute this number	
−2	2(-2) +3	−1
−1		
0		
1		
2		
3		

(b) Draw a graph of the function on the axes provided.



Lesson #4

Alg

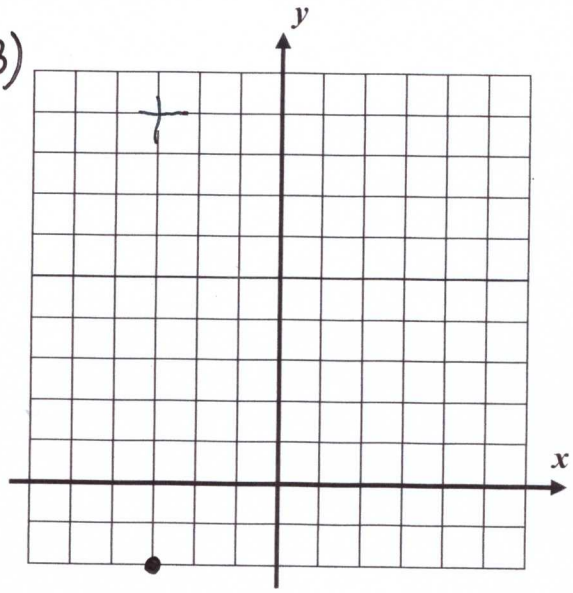
Never forget that all we need to do to **translate** between an equation and a graph is to **plot** input/output pairs according to whatever rule we are given. Let's look at a simple **linear** function next.

Exercise #3: Consider the simplest Linear **function** $f(x)=x+1$ Fill out the function table below for the inputs given and graph the function on the axes provided.

(A)

x	$x+1$	y	point
−3	−3 +1	−2	(−3,−2)
−2			
−1			
0			
1			
2			
3			

(B)



Sometimes the function's rule gets all sorts of funny and can include being **piecewise defined**. These functions have different rules for different values of x. These separate rules combine to make a larger (and more complicated rule). Let's try to get a feel for one of these.

Exercise #4: Consider the function given by the formula $f(x)=\begin{cases}2x+6 & x<0\\ 2x+6 & x\geq 0\end{cases}$ Your teacher will help you understand the notation of this function.

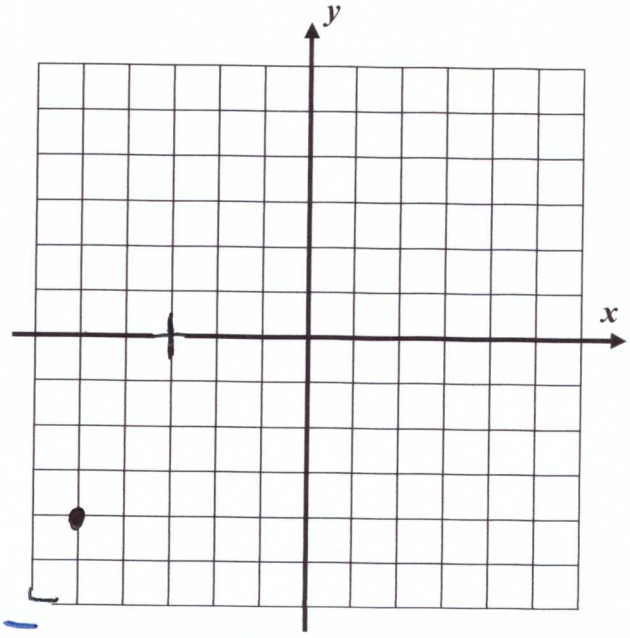
(a) Evaluate each of the following:

$f(4)=$ $\qquad$ $f(-3)=$

(b) Fill out the table below for the inputs given. Keep in mind which formula you are using.

x	$2x+6$	(x,y)
−5	2(−5)+6	(−5,−4)
−4		
−3		
−2		
−1		
0		
1		

(c) Graph $y=f(x)$ on the axes below.



Name: _____ Unit # 3 Lesson # 4

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

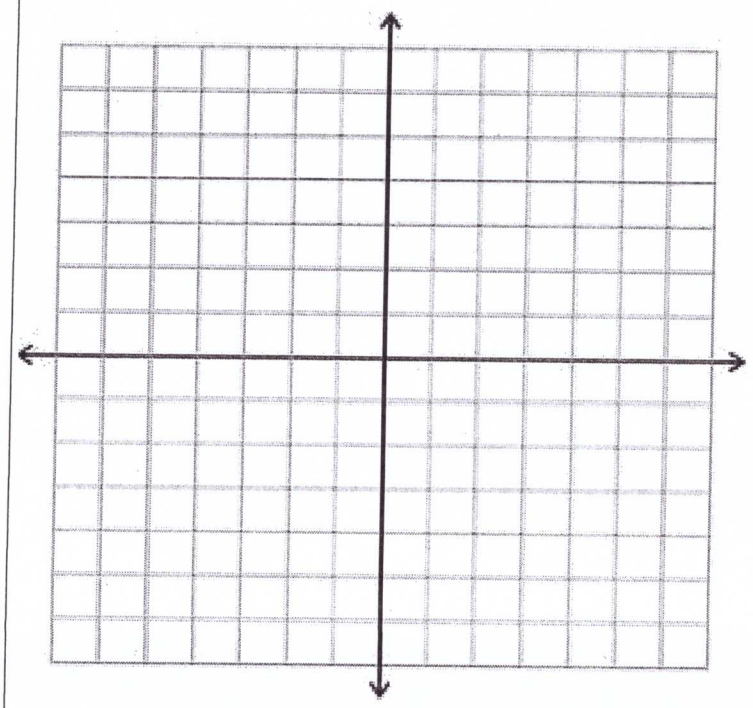
Unit # 3 Lesson # 4

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Name: _____ Date: Algebra

THE DOMAIN AND RANGE OF A FUNCTION
COMMON CORE ALGEBRA I

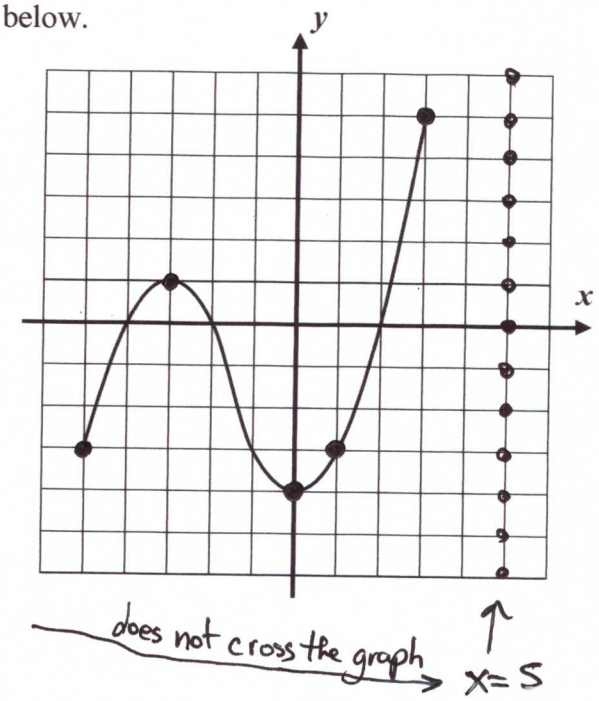
Unit 3 Lesson 5

Ultimately, all functions do is convert inputs into outputs. So, each function has two **sets** associated with it. Those things that serve as **inputs** and those things that serve as **outputs**. These sets are given names.

THE DOMAIN AND RANGE OF A FUNCTION

1. The **domain of a function** is the set of **all inputs** for which the function rule can give an output.
2. The **range of a function** is the **set of all outputs** for which there is an input that results in them.

Exercise #1: Consider the function $y = f(x)$ shown on the graph below.



(a) Evaluate each of the following:

$f(-3) =$ $f(1) =$ $f(3) =$

(b) Can the function rule, given by the graph, give you a value when $x = 5$? If so, what is it? If not, why not?

(5, y) is not on the line

(c) Is $x = 5$ in the **domain** of the function?

___ (yes or No), the graph stops at x = ___ of f(x)

(d) Give two other values of x that are in the **domain** of the function. Write the points

___ ≤ x ≤ ___ (Left most ≤ x ≤ Right most) (___, -3) and (___, 5)

(f) Write the range of this function. Write the points

___ ≤ y ≤ ___ (Lower most ≤ y ≤ upper most) (0, ___) and (3, ___)

Practice with Domain and Range of a Function

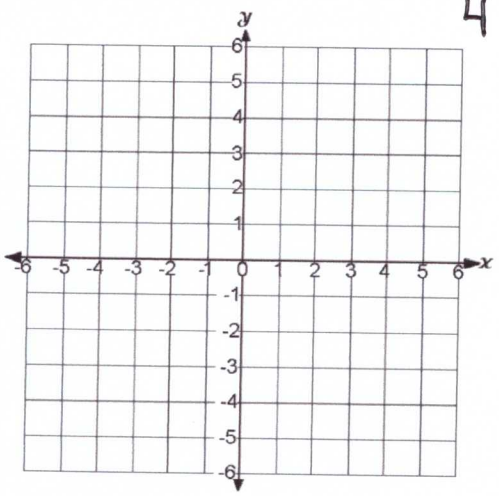
Algebra
Lesson #5
Unit 3

1. $y = x - 2$

a. Create a table to show the range if the domain is -4, 0, 4.

x	y
-4	
0	
4	

b. Graph the relation

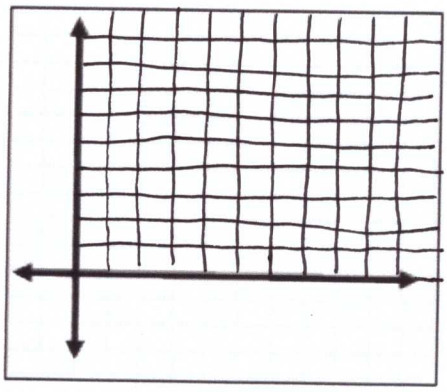


c. Is the relation a function?

2.

Time (s)	Height (m)
0	7
2	10
4	5
4	0
7	0
8	3

a. Graph the data.



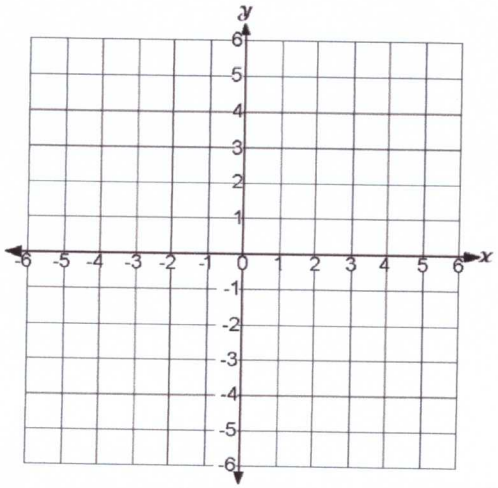
b. Is this relation a function? NO

c. Why? Because ___ has two outputs ___ and ___.

3. {(3, 4), (-2, 5), (6, 3), (3, -2)}

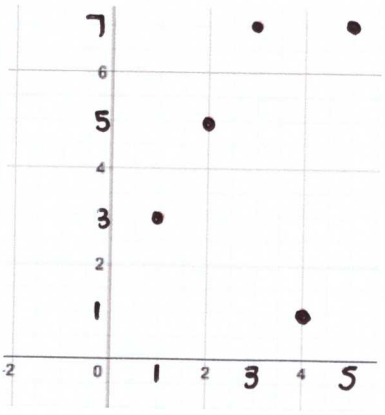
a. Create a table to represent the relation.

b. Graph the relation.



c. Is this relation a function? ___

4.



x	y

a. Is this relation a function?

b. Why? Every ___ has a unique ___.

c. Create a table of the data gathered from the graph above.

Name: _____ Unit # 3 Lesson # 5

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

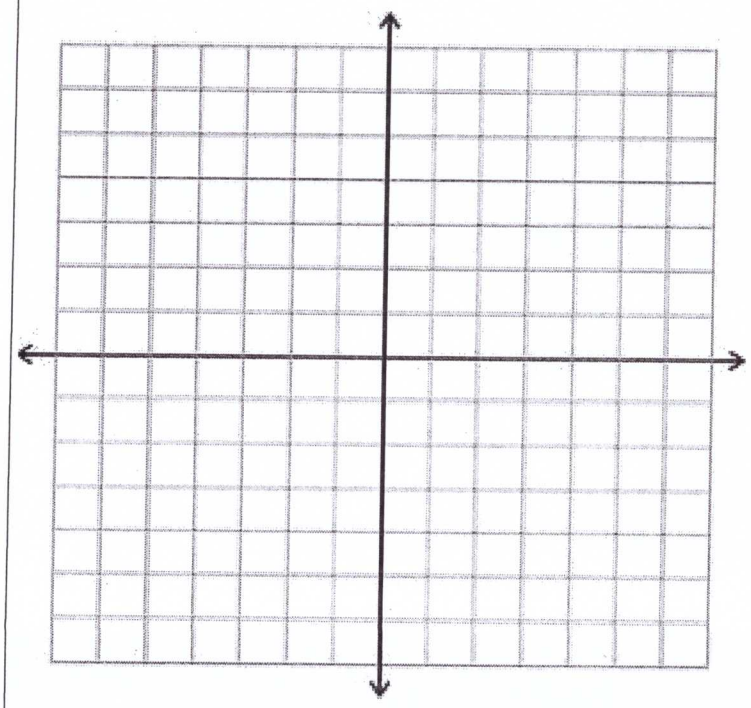
Unit # 3 Lesson # 5

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Name: _____ Date: Alg

AVERAGE RATE OF CHANGE
COMMON CORE ALGEBRA I HOMEWORK

Lesson #6
Unit 3

FLUENCY

Enter in the calculator

1. Consider the function given by $f(x) = 9 + X$. Find its average rate of change between the following points. Carefully show the work that leads to your final answer.

(a) $x = 0$ to $x =$

X	f(x)
0	9
3	12

+3 on bottom; +3 on top; $\frac{+3}{+3} = 1$

(b) $x = -1$ to $x = 5$

X	f(x)

(c) $x = -2$ to $x = 2$

X	f(x)

2. The function $f(x)$ is given in the table below. Find its average rate of change between the following points. Show the calculations that lead to your answer.

(a) $x = -3$ to $x = 1$

X	f(x)
-3	7
1	3

$\frac{-4}{4} = -1$; $+4$ on bottom; -4 on top

(b) $x = 0$ to $x = 4$.

X	f(x)

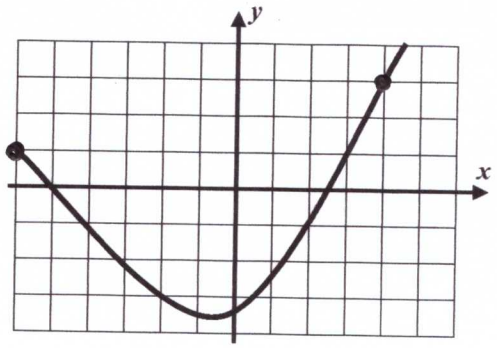
x	$f(x)$
–3	7
0	–2
1	3
4	–8

3. The function $f(x)$ is given in the graph below. Find its average rate of change between the following points. Show the calculations that lead to your answer.

(a) $x = -6$ to $x = 4$

X	f(x)
-6	
4	

(-6, ___) and (4, ___)



Alg
Lesson #6

APPLICATIONS

4. The following table shows the number of points the Arlington girls team scored in their last basketball game where t is the time passed in minutes and $f(t)$ the total number of points scored after t minutes.

t	$f(t)$
0	0
8	30
16	48
24	55
32	64

(a) What was the average rate they were shooting in the game? Be sure to include proper units in your answer.

t | f(t)
0
32

(c) Given your answers above scores, what can you say?

the girls scored ___ points per 1 minute.

REASONING

5. Consider the function given by $f(x)=6x+5$.

(a) Find its average rate of change from $x=1$ to $x=5$.

f(5)=6(5)+5
f(5)=___+5
f(5)=___

f(1)=6(1)+5
f(1)=___+5
f(1)=___

x | f(x)
1
5

(c) The average rate of change for this function is always 6 (as you should have found in the first two parts of the problem). What type of function has a constant average rate of change? What do we call this average rate of change in this case? Search the Internet if needed.

slope

This is called ___.

Name: _____ Unit # 3 Lesson # 6

Activator

New Vocabulary (1 of 4)

New Vocabulary (2 of 4)

New Vocabulary (3 of 4)

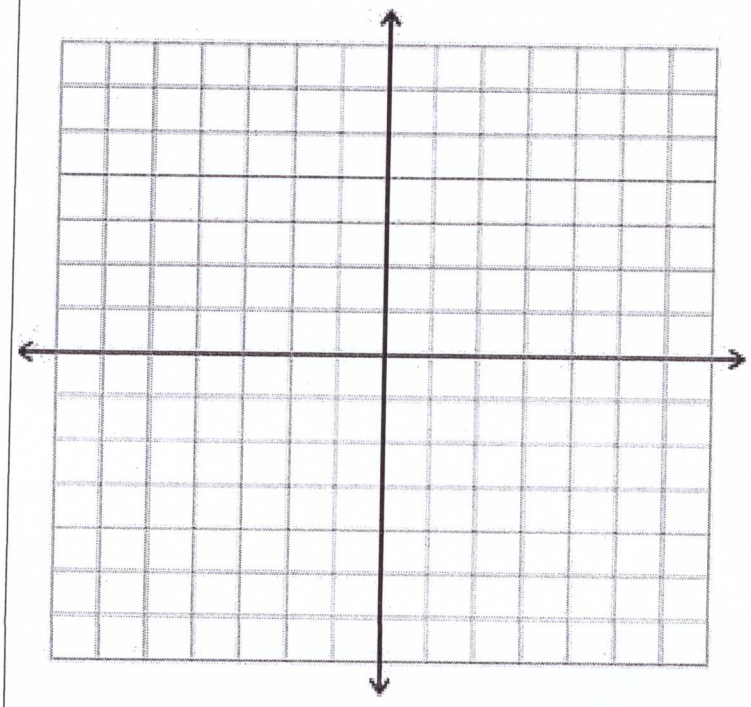
Unit # 3 Lesson # 6

Misconception (4 of 4)

Work Period

Exit Ticket

Extra Graph Paper



Name: _____

UNIT #3 Study Guide
COMMON CORE ALGEBRA I

Study Guide

PART I QUESTIONS: Answer all questions in this part. Show all of your work.

1. If $g(x) = 5x + 2$ and $f(x) = x - 4$ then which of the following is the value of $g(-6)$ and $f(-5)$?

$g(\ ) = 5(\ ) + 2$

$f(\ ) = (\ ) - 4$

2. If a function is defined by the formula $f(x) = \frac{1}{4}x - 2$ and its domain is given by the set $\{-8, -4, 0, 4\}$ which of the following sets gives the function's range?

• Substitute

$\{\_\_, \_\_, \_\_, \_\_\}$

range is y or f(x)

x	f(x)
-8	
-4	
0	
4	

Substitute OR use the calculator

3. The distance, d, that a car has traveled, as a function of time, t, is given in the table below. What is the average rate of change of the distance over the interval $4 \le t \le 10$ ← use these numbers

(y)	d (miles)	0	119	150	271	332	468
(x)	t (hours)	0	2	4	6	8	10

• determine the distance and the number of hours during the given interval.

t	d
4	150
10	468

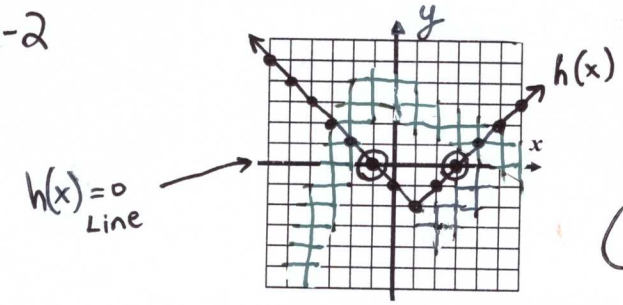
__ hours → __ miles

Divide $\frac{\text{miles}}{\text{hours}}$ to get mph

↑ miles per hour

4. For the function $h(x)$ shown graphed below, over which of the following intervals is $h(x) = 0$

$h(x) = |x - 1| - 2$



$\_\_ \le x \le \_\_$

(__, 0) (__, 0)

x x

5. For the function defined by $f(x) = \begin{cases} 3x-1 & x<5 \\ 3x-1 & x \geq 5 \end{cases}$, which of the following represents the value of $f(6)$?

$f(\ ) = 3(\ ) - 1$

$6 < 5$ NO

$6 \geq 5$ yes

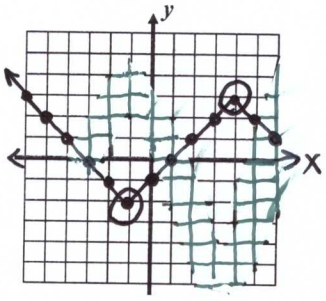
and $f(-3)$

6. For function $g(x)$ graphed below, over which of the following intervals is $g(x)$ increasing

(_, _)

and

(_, _)



from Left to right the graph should go up

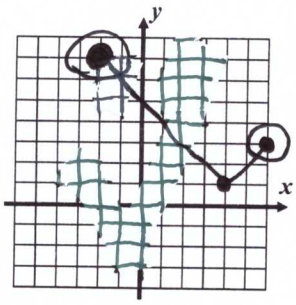
7. Given the graph of the function $f(x)$ shown below, which of the following intervals represents its domain

domain

$\underline{\quad} \leq x \leq \underline{\quad}$

Left Right

(_, 7) (_, 3)



define domain: _____

_____

what is the difference between an open circle and a closed circle? _____

8. A function is initially defined by the set of coordinate pairs $\{(-2,6),(-5,4),(7,-3)\}$. Which coordinate pair below, if added to this set, prevents the set from representing a function?

$(\frac{-2}{x}, \_\_)$ add this to create a non-function

Explain why? -2 is repeated

Define a non-function: it has repeating $\frac{\text{x}}{\text{x or y}}$ values.

9. If the function $h(x)$ is defined by h(x) = 3x then which of the following values of x solves the equation $h(-12)$?

$h(\ ) = 3(\ )$ Substitution problem

$h(\ ) =$ _____

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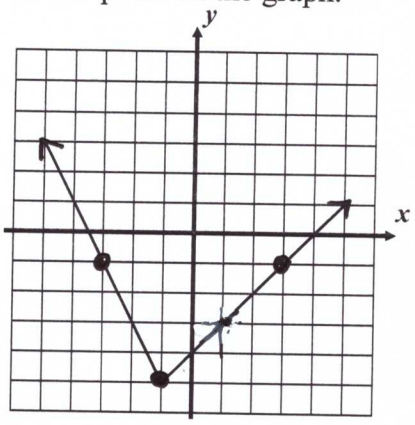
PART II QUESTIONS: Answer all questions in this part. Show all of your work.

10. The function $f(x)$ is shown on the graph. What point does f(-1) represent? Put this point on the graph.

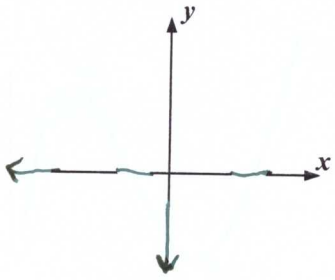
(-1 , —)



11. What point(s) does the value of f(x) = -1 represent? Graph the point(s).

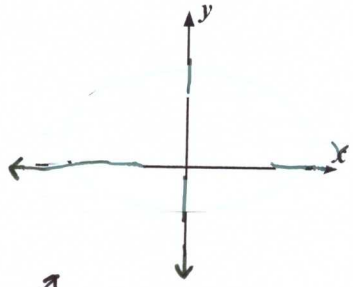
(— , -1) and (— , -1)

12-13. Do the following graphs represents functions? Explain how you arrived at your choice.



draw a non-function

Explain: X value repeats



draw a function

Explain: x value doesn't repeat

PART III QUESTIONS: Answer all questions in this part. Show all of your work.

14. Two functions, and $g(x)$, are given below. Determine which of these functions has the greater average rate of change over the interval $1 \leq x \leq 5$

The average rate of change shows ...

divide the two numbers

change ?

x	0	1	2	3	4	5	6
$g(x)$	0	2	4	8	16	34	68

change ?

x	g(x)
1	2
5	34

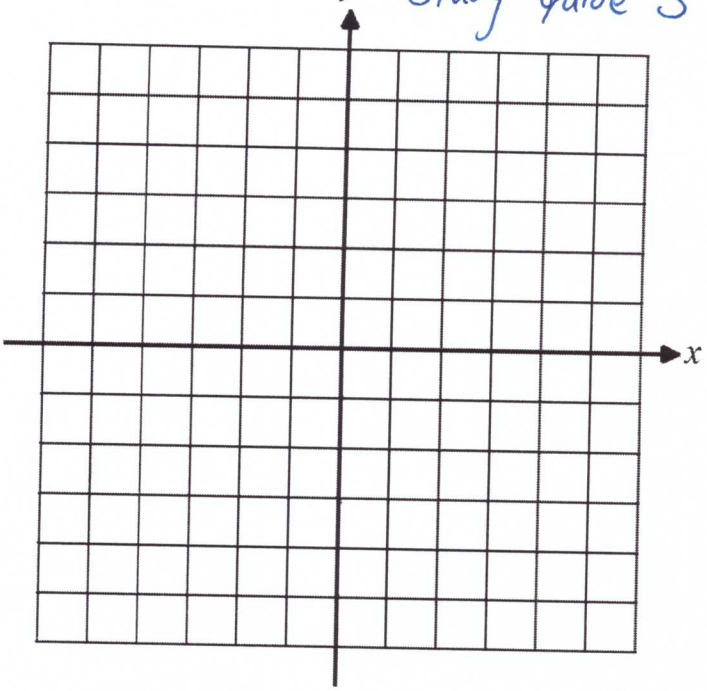
— < > —

15. Graph the piecewise function shown below on the axes provided. Which point below is on the graph?

$$f(x)=\begin{cases} -3x-8 & -4\le x\le -2 \\ 2x-3 & 0\le x\le 3 \end{cases}$$

x	f(x)
-4	
-3	
-2	

x	f(x)
0	
1	
2	
3	



16. What is the value of f (-3) for this piecewise function? Circle this point on your graph.

which point is on the $x=-3$ line?

(__, __)

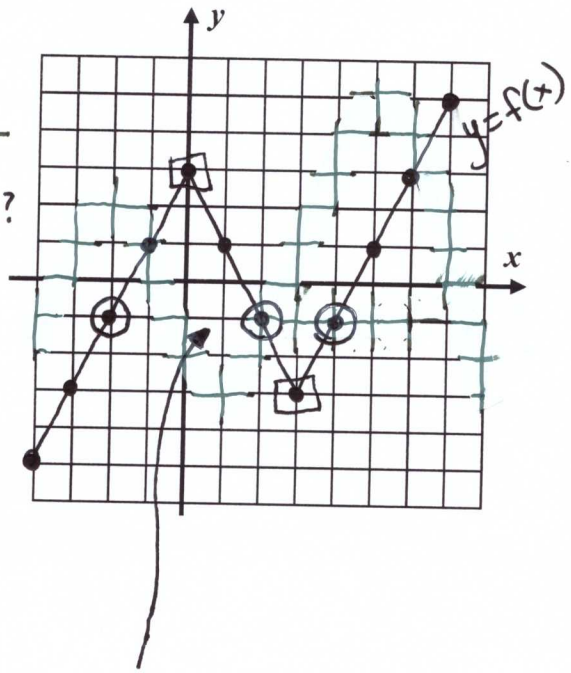
PART IV QUESTION: Answer the question in this part. Show all of your work.

17. For the function $f(x)$ shown graphed below answer the following questions.

State the domain and range.

___ $\le x \le$ ___ ___ $\le f(x) \le$ ___

how far Left? | domain | how far right? | how Low? | range | how high?



18. What values of x solve the equation $f(x)=-1$

Circle points on your graph that justify your solution.

There are 3 x-values on $f(x)=-1$

$x=\{$ ___, ___, ___ $\}$

x	y
	-1
	-1
	-1

19. Give the intervals over which $f(x)$ is decreasing, and, circle the decreasing sections on the graph.

decreasing interval

_____ $\le x \le$ _____

Left (Top of the hill) | right (Bottom of the hill)

from Left to right it is going _____.