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

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

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

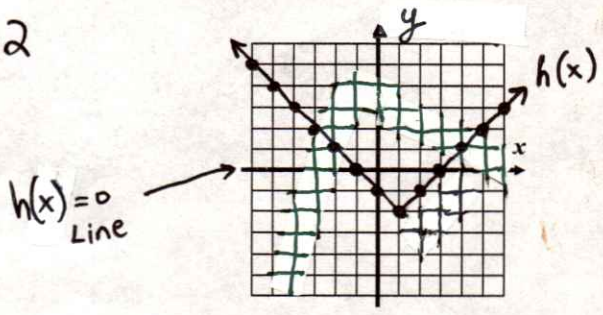
d (miles)	0	119	150	271	332	468
t (hours)	0	2	4	6	8	10

__ change ?

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

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

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



__ ≤ x ≤ __

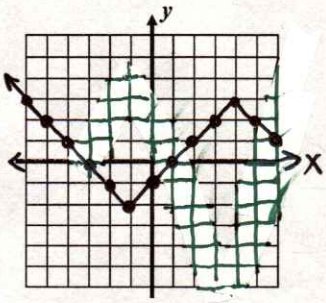
5. For the function defined by $f(x)=\begin{cases}3x-1 & x<5\\ 8-2x & x\geq 5\end{cases}$ which of the following represents the value of $f(6)$?

Should you substitute into the top or bottom ?

Why? _____

_____

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



from Left to right the graph should go _____

___ $\leq x \leq$ ___

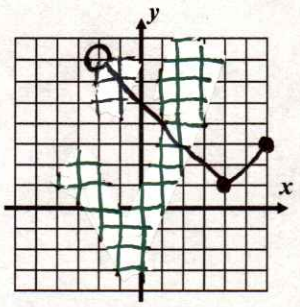
use the number line

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

circle ↓ domain ↓

___ < OR ≤ X < OR ≤ ___

↑ circle



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?

(__, __) add this to create a non-function

Explain why? _____

Define a non-function: it has repeating ___ 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

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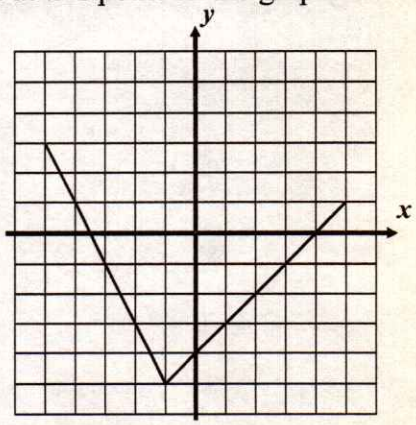
PART II QUESTIONS: Answer all questions in this part. Show all of your work.

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

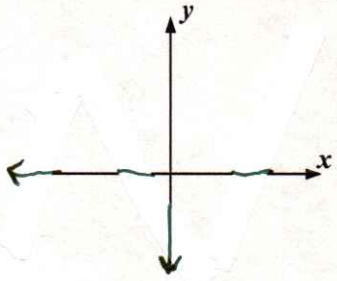


(-1 , —)

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

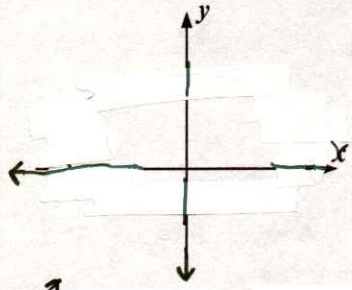
(— , -1) and (— , -1)

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



draw a non-function

Explain: does not pass the Vertical Line Test
x values repeat



draw a function

Explain: passes the Vertical Line Test
No repeating x-values

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

14. Two functions, $f(x)$ 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 ...

$f(x) = x^3 + 4x$ $f(x) = x^3 + 4x$

change ?

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

change ?

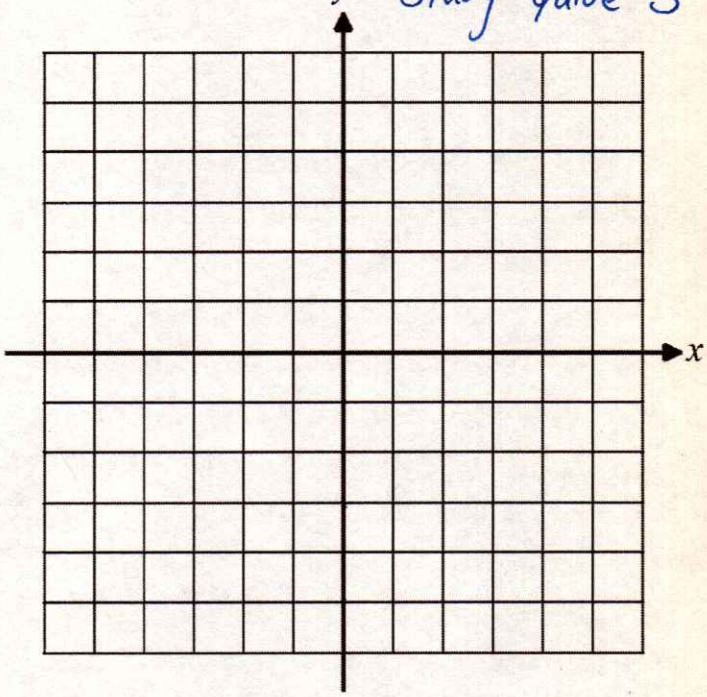
$\frac{\square}{\square} = \_\_\_$

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?

(___, ___)

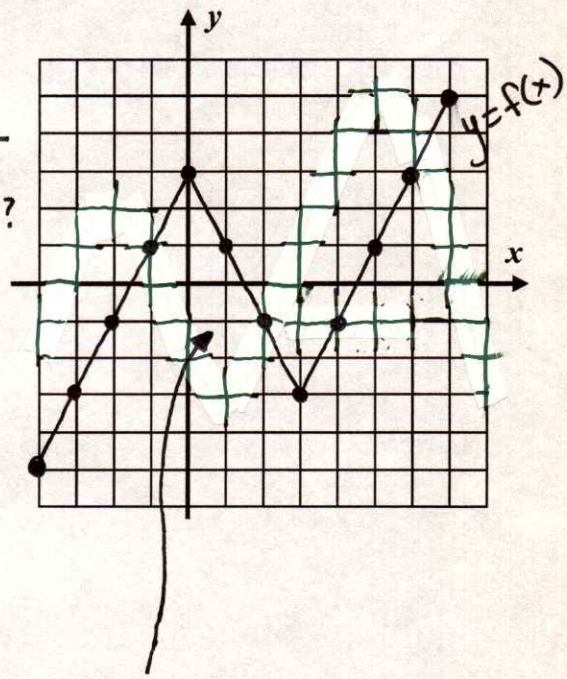
PART IV QUESTION: Answer the question in this part. Show all of your work.

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 $f(x)=-1$

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

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

___ $\le x \le$ ___

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

Decreasing interval

from Left to right it is going ___.