

Name: _____

Answer Key

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 $f(-5)$?

$g(-6) = 5(-6) + 2$ $f(-5) = (-5)^2 - 4$

$g(-6) = -30 + 2$ $f(-5) = 25 - 4$

$g(-6) = -28$

$f(-5) = 21$

OR use
the calculator
Enter what is after
the equal sign.

Substitute into g
Substitute into f

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 •

x	y
-8	-4
-4	-3
0	-2
4	-1

$\left\{ \frac{-4}{-}, \frac{-3}{-}, \frac{-2}{-}, \frac{-1}{-} \right\}$
Range

use calculator

$y = \frac{1}{4}(-8) - 2$ $y = \frac{1}{4}(-4) - 2$ $y = \frac{1}{4}(0) - 2$ $y = \frac{1}{4}(4) - 2$
 $y = -2 - 2$ $y = -1 - 2$ $y = 0 - 2$ $y = 1 - 2$
 $y = -4$ $y = -3$ $y = -2$ $y = -1$

all of these points are on the line.

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 $4 \leq t \leq 10$ ← use these numbers

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

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

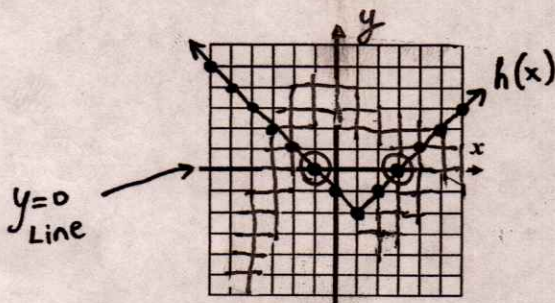
d	t
150	4
468	10

+ 318 Miles

$\frac{468 - 150}{10 - 4}$
miles +6 per (Divide) +318
hours +6

is 53 mph

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



$y \leq 0$
↑ Less than OR equal to

$-1 \leq x \leq 3$

The part of the graph below the x-axis.

$(-1, 0)$ $(3, 0)$

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 $f(6)$? less than

$$f(6) = 3(6) - 1$$

$$f(6) = 18 - 1$$

$$f(6) = 17$$

OR use the calculator

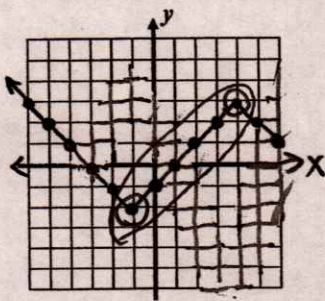
Should you substitute into the top or bottom?
Why? bottom because $6 \geq 5$.

↑ greater than OR equal to

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

$$\frac{-1}{x} \leq x \leq \frac{4}{y}$$

\uparrow $(-1, -2)$ \uparrow $(4, 3)$
 x y x y

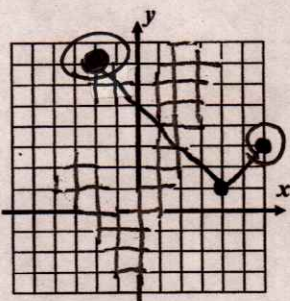


↑
from left to right
the graph should
go up

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

$$\frac{-2}{\text{far left}} \leq x \leq \frac{6}{\text{far right}}$$

domain



define domain: It explains how wide the function is on a graph.

what is the difference between an open circle and a closed circle? excluded, included in the domain

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?

$$\left(\frac{-2}{\text{any \#}}, \frac{\text{any \#}}{\text{any \#}}\right) \text{ OR } \left(\frac{-5}{\text{any \#}}, \frac{\text{any \#}}{\text{any \#}}\right)$$

Explain why? I made the x values repeat. So, it is not a function.

Define a non-function: it has repeating x values.

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

$$h(-12) = 3(-12)$$

$$h(-12) = -36$$

x	$h(x)$
-12	-36

Name: Answer Key

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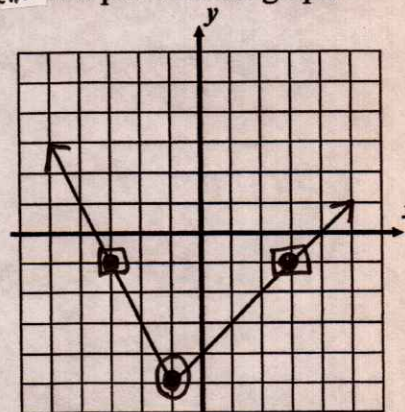
Algebra

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? Circle this point on the graph.

$$\left(\underline{-1}, \underline{-5} \right)$$

x	f(x)
-1	-5

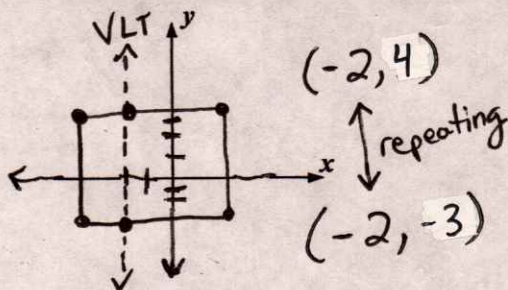


11. What point(s) does the value of $f(x) = -1$ represent? Box the point(s).

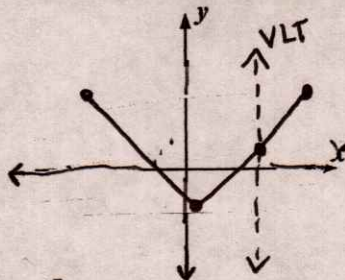
$$\left(\underline{-3}, \underline{-1} \right) \text{ and } \left(\underline{+3}, \underline{-1} \right)$$

x	f(x)
-3	-1
3	-1

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



draw a non-function



draw a function

Explain: repeating x values

Explain: VLT has only one point.
x values do not repeat.

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 ...

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

x	g(x)
1	2
5	34

$$4 \left\langle \frac{1}{5} \left| \frac{2}{34} \right. \right\rangle 32 \cdot \frac{32}{4}$$

Average Rate of change: $g(x)$

Average rate of change for $g(x)$

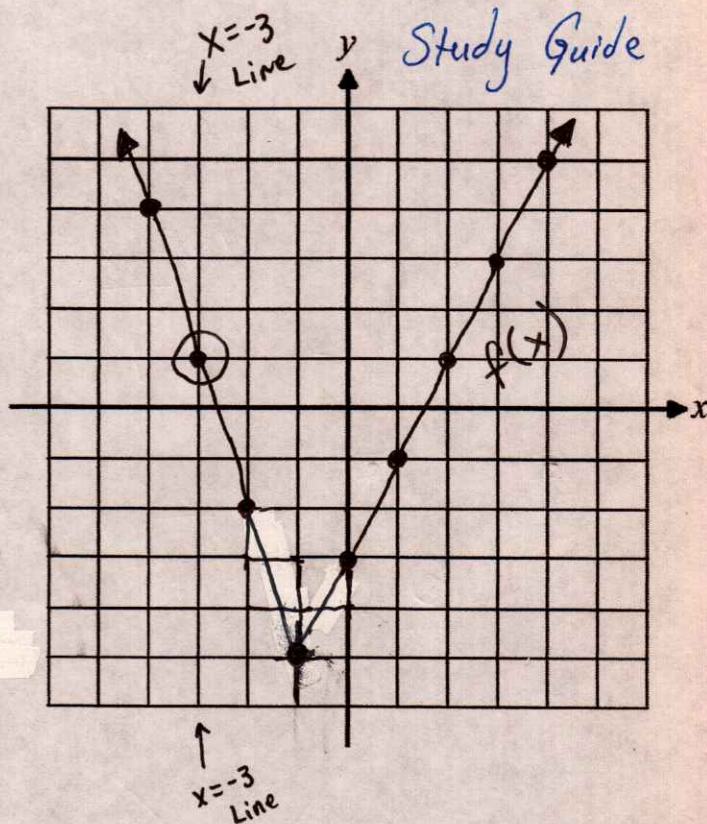
Algebra Unit 3

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

$$f(x) = \begin{cases} -3x - 8 & -4 \leq x < -1 \\ 2x - 3 & -1 \leq x \leq 3 \end{cases}$$

x	f(x)
-4	4
-3	1
-2	-2
-1	-5

x	f(x)
-1	-5
0	-3
1	-1
2	1



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

Which point is $f(-3)$?

$$\left(\frac{-3}{x}, \frac{1}{y} \right) \quad \begin{array}{c|c} x & y \\ \hline -3 & 1 \end{array}$$

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

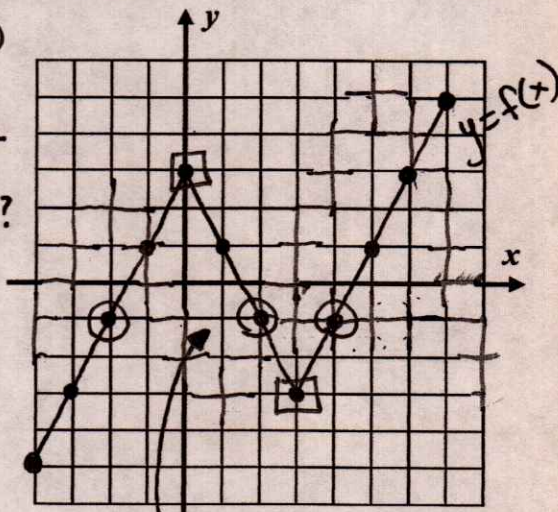
17. For the function $f(x)$ shown graphed below answer the following questions.

State the domain and range $(-4, -5)$ $(7, 5)$

$(-4, -5)$ $(7, 5)$

$-4 \leq x \leq 7$ $-5 \leq f(x) \leq 5$

how far left? domain how far right? range how low? 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 $f(x) = -1$

$$x = \left\{ -2, 2, 4 \right\}$$

x	y
-2	-1
2	-1
4	-1

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

$0 \leq x \leq 3$

decreasing interval

from left to right it is going down.

Look at the \square on the graph

Left (Top of the hill) $(0, 3)$

Right (Bottom of the hill) $(3, -3)$