PART I QUESTIONS: Answer all questions in this part. **Make sure you show all of your work.**

1. Which of the following is equivalent to $4(\underline{6}x + 7)$

$4(6x)$ is $24x$

$4(7)$ is 28

$24x + 28$

Distribute which means multiply to both parts

2. Which of the following is the value of the expression $\dfrac{-3+x}{4}$ when $x = -9$

Substitute then distribute

$\dfrac{-3+(-9)}{4}$ is $\dfrac{-3-9}{4}$ is $\dfrac{-12}{4}$ is -3

3. If the expression $2+5x$ is equal to 42 for some value of x. Does $x = 8$?

$2 + 5(8)$

$2 + 40$

42 yes equals

4. Is binomial $-7+2x$ equivalent $2x-7$? Yes, by the Commutative Property

The order can change.

5. Fill in the blank $3x + x + \underline{\quad} = 9x$

$4x + \underline{\quad} = 9x$

$x + x + x + x$

$3x + x$

$4x$

This blank should be $5x$

$4x + 5x = 9x$ Yes

-3A-

6. The sum of $6-x$ and $4x-1$ is

$$6 - x + 4x - 1$$

$$-x + 4x + 6 - 1$$ Commutative property

$$3x + 5$$ Combine Like Terms (CLT)

7. Which of the following equations illustrates the distributive property and commutative property?

$$-2(x) = -2x$$ $$-2 + x = x - 2$$

Distributive   Commutative

( ) are gone   the order changed

8. Which of the following is $3(-6x)$

$$-18x$$ distribute

9. The expression $2(x) + 5x + 3$ is equivalent to each of the following

distribute

$$2x + 5x + 3$$

Combine Like terms

$$7x + 3$$

10. When written in simplest form the expression $4(-6x + 7) + 3(8 - x)$

$$-24x + 28 + 24 - 3x$$ Distribute

$$-24x - 3x + 28 + 24$$ Commutative

$$-27x + 52$$ Combine Like terms

- 38 -

Name: **Key Study Guide**

PART II QUESTIONS: Answer all questions in this part. Make sure you show all of your work.

11. Find the Sum of $-2x$ with $8x$ in simplest form.

$$8x - 2x$$

$$6x$$

12. If n represents a number, simplify the expression. $-4(n-5)$ — negative times negative

$$-4n + 20$$

13. Which of the following is equivalent to the expression $\dfrac{8+x}{2}$ when $x = -4$

$$\frac{8+(-4)}{2} \text{ is } \frac{8-4}{2} \text{ is } \frac{4}{2} \text{ is } 2$$

PART III QUESTIONS: Answer all questions in this part. Make sure you show all of your work.

14. Which of the following properties justifies the equivalence: Define the answer.

$$3 + n = n + 3 \qquad and \qquad 6(x) = 6 \cdot x$$

Commutative
order changed

Distributive
( ) are gone

15. If $4x - 7 = -5$ for some value of x, is it true when $x = -3$? Show substitution.

$$4(-3) - 7 = -5$$
$$-12 - 7 = -5$$
$$-19 = -5$$

No, x does Not equal -3

b/c the last equation is

-4A- Not true.

16. Of the following, which are equivalent?

$$7 - n = n - 7 \quad \text{or} \quad 3(x+4) = 3x + 12$$

By the distributive property

17. Combine like terms for the expression $-3x - 5x + 7$

Combine Like terms $-8x + 7$

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

18. What is following step to simplify the expression?

Expression $-3(4x - 1) + 7(5x - 2)$

Step #1 $-12x + 3 + 35x - 14$

The distributive property b/c the ( ) are gone.

$-12x + 35x + 3 - 14$

Commutative property changes the order

$23x - 11$

↑ simplified

19. Simplify the problem above.

Name: **Key Study Guide**

UNIT #2 Study Guide Algebra I

PART I QUESTIONS: Answer all questions in this part by writing the choice of the appropriate answer in the blank beside the problem. Please show all of your work.

1. Which of the following values of x is a solution to the equation $4(x-3) + 8 = 68$

   Distribute

   $4x - 12 + 8 = 68$

   CLT

   $4 \times \boxed{\begin{array}{c}-4\\+4\end{array}} = \begin{array}{c}68\\+4\end{array}$ Addition

   $4(s)$

   $4x = 72$ Division

   $\div 4 \quad \div 4$

   $\boxed{x = 18}$

2. Solve the two step equation $\dfrac{x}{-4} \boxed{\begin{array}{c}+5\\-5\end{array}} = \begin{array}{c}-7\\-5\end{array}$ subtract opposite of Add

   $\dfrac{x}{-4} = -12$

   $(-4) \qquad (-4)$ multiply opposite of divide

   $x = 48$

3. Write a true inequality when $x = -2$.

   $x < \underline{-1}$ $x \leq \underline{-2}$ OR $x \leq \underline{-1}$

   $x > \underline{-3}$ $x \geq \underline{-2}$ OR $x \geq \underline{-3}$

4. Two times the sum of a number, n, and 4 is at most 20. Which of the following inequalities properly models this statement? Write this statement.

   at most OR

   $2(n + 4) \leq 20$

   ↑   times   sum of n and 4

   $<$ means __less than__

   $>$ means greater than

   $\leq$ means less than or equal to

   $\geq$ means greater than or equal to

-7A-

Answers

5. Max correctly starts solving the linear equation $3(x+7) = -9$ writing $x+7 = -3$ Which of the following properties justifies what Max wrote?

$$\div 3 \qquad \div 3$$

$$x + 7 = -3 \qquad \text{Max did division}$$

6. Which of the following graphs shows the solution set to $3x - 7 > 8$

Graph the solution

addition $+7 \quad +7$

(open circle)

OR

Closed circle

$$3x > 15$$

division $\div 3 \qquad \div 3$

$$x > 5$$

why?
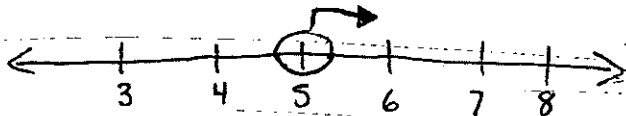
not equal to five

greater than OR less than

7. The value $x = 8$ is a solution to each of the following, except which?

$$x - 4 > 3x \qquad \text{OR} \qquad 2(x+3) = 4x - 10$$

$$(8) - 4 > 3(8) \qquad\qquad 2((8) +3) = 4(8) - 10$$

$$4 > 24 \qquad\qquad 2(11) = 32 - 10$$

No, False, Not a Solution

$$22 = 22$$

Yes, True, it is a solution

8. Plato was saving $\$10$ each week in order to have enough money for a phone that costs $\$150$. If his father started him off with $\$20$ which of the following is the minimum number of whole weeks Plato will need to save? Write an equation and solve.   Let $x =$ the minimum number of weeks

Plato needs to
Save for 13 weeks.

$$10x + 20 = 150$$
$$\quad - 20 \qquad -20 \qquad \text{subtraction}$$
$$10x = 130$$
$$\div 10 \qquad \div 10 \qquad \text{Division}$$
$$x = 13$$

-7B-

PART II QUESTIONS: Answer all questions in this part. Please show all of your work.   *Algebra*

9. The volume of a cone is given by the formula $V = \frac{1}{3}\pi r^2 h$ Solve this equation for the height, h, in terms of V and r.

$$(3)\quad(3)\qquad \text{multiplication}$$

$$3V = \pi r^2 h$$

$$\div \pi r^2 \quad \div \pi r^2 \quad \text{division}$$

$$\boxed{\frac{3V}{\pi r^2} = h} \leftarrow \text{ solved for } h. \ H \text{ is by itself.}$$

10. When a number, X is increased by _4_, and then the result is _multiplied by 6_   is equal to _18_.
    Write an equation and solve it to find the value of X.

$$6(x+4) = 18$$
$$6x + 24 = 18$$
$$\quad -24 \quad -24$$
$$6x = -6$$
$$\div 6 \quad \div 6$$
$$\boxed{x = -1}$$

equation $\longrightarrow$

$$6(x+4) = 18$$
$$\div 6 \qquad \div 6 \quad \text{division}$$
$$x + 4 = 3$$
$$-4 \quad -4 \quad \text{subtraction}$$
$$\boxed{x = -1}$$

11. Justify your response, is the value $x = -4$ a solution to the inequality $5x - 3 > 6x$

Substitution problem

$$5(-4) - 3 > 6(-4)$$
$$-20 - 3 > -24$$
$$-23 > -24$$

Yes, True, it is a Solution

12. Solve the following equation for x. Show the manipulations that lead to your final answer.

only + or − in front

$$7(x+2) - 3x + 4 = (x - 5) + (x - 3)$$

Distribute

$$7x + 14 - 3x + 4 = x - 5 + x - 3$$

CLT

$$4x + 18 = 2x - 8$$
$$-2x \qquad\qquad -2x$$

Subtraction

$$2x + 18 = -8$$

Subtraction

$$-18 \qquad -18$$

Division

$$2x = -26$$
$$\div 2 \quad \div 2$$

$$\boxed{x = -13}$$

-8A-

13. Algebraically solve the inequality. $5x - 146 \leq -9(3x + 2)$

Distribute Algebra

$$5x - 146 \leq -27x - 18$$
$$+27x \qquad\qquad +27x \qquad\qquad \text{addition}$$

$$32x - 146 \leq -18$$
$$+146 \qquad +146 \qquad\qquad \text{Addition}$$

$$32x \leq 128$$
$$\div 32 \qquad \div 32 \qquad\qquad \text{Division}$$

14. Graph the inequality from #13 on the number line. $\boxed{x \leq 4}$

closed b/c equal to
Left b/c Less
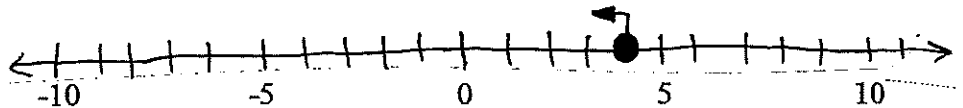
15. Give a property of real numbers or a property of equality to justify each step in the solution of the equation shown below.

Commutative (changed order) Step 1
Combine Like terms (CLT) Step 2
Addition Postulate Step 3
Division Postulate Step 4

$$4x - 8 + 2x + 1 = 37$$
$$4x + 2x - 8 + 1 = -37$$
$$6x - 7 = -37$$
$$6x = -30$$
$$x = -5$$

16. Solve the following multistep equation. $-3x - 4 = -22$

$$+4 \qquad +4 \qquad \text{Addition}$$

$$-3x = -18$$
$$\div -3 \qquad \div -3 \qquad \text{Division}$$

$$\boxed{x = 6}$$

-88-

Name: __Answer Key__

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 $f(-5)$?

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

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

$\boxed{g(-6) = -28}$ $\boxed{f(-5) = 21}$

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

$\{-4, -3, -2, -1\}$
range

use calculator

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

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

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

$y = \frac{1}{4}(4) - 2$
$y = 1 - 2$
$\boxed{y = -1}$

← 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 $4 \le t \le 10$ ← 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
4	150
10	468

+6 hours
+318 Miles

$\dfrac{468 - 150}{10 - 4}$ miles per (divide) hours

$\dfrac{+318}{+6}$ is $\boxed{53 \text{ mph}}$

4. For the function $h(x)$ shown graphed below, over which of the following intervals is $y \le 0$
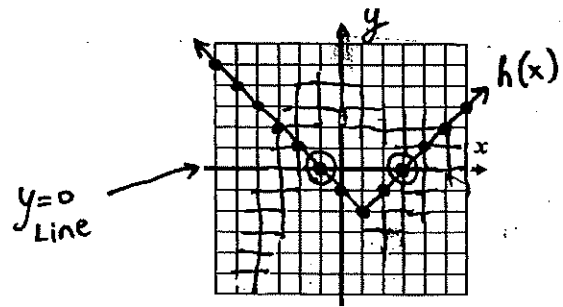
↑ Less than OR equal to

$-1 \le x \le 3$

$h(x)$

$y = 0$ Line

The part of the graph below the x-axis.

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

$-11A-$

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

less than (annotation pointing to $x<5$)
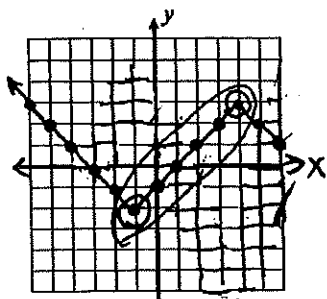
$f(6) = 3(6) - 1$

$f(6) = 18 - 1$

$f(6) = 17$

OR use the calculator

should you substitute into the top or bottom?

why? <u>bottom because $6 \ge 5$.</u>

↑ greater than OR equal to

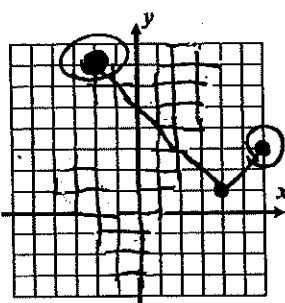6. For function $g(x)$ graphed below, over which of the following intervals is $g(x)$ increasing

$\dfrac{-1}{(-1,-2)} \le x \le \dfrac{4}{(4,3)}$

$\underset{x \; y}{(-1,-2)}$ $\underset{x \; y}{(4,3)}$

from Left to right the graph should go <u>up</u>

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

domain

$\dfrac{-2}{\underset{\text{Left}}{\text{far}}} \le x \le \dfrac{6}{\underset{\text{right}}{\text{far}}}$

define domain: <u>It explains how wide the function is on a graph.</u>

what is the difference between an open circle and a closed circle? <u>excluded, included</u> 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?

$\left(\dfrac{-2}{\quad}, \dfrac{Any\#}{\quad}\right)$ or $\left(\dfrac{-5}{\quad}, \dfrac{any\#}{\quad}\right)$

$\left(\dfrac{7}{\quad}, \dfrac{any\#}{\quad}\right)$

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

Define a non-function: <u>it has repeating <u>X</u> Values.</u>

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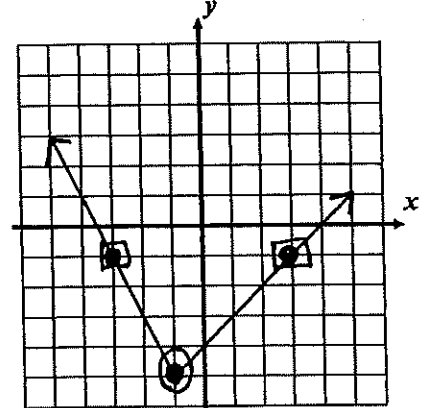
$h(-12) = 3(-12)$

$h(-12) = -36$

X	h(x)
-12	-36

$-118-$

Name: __Answer Key__ Date: __Study Guide Unit 3__
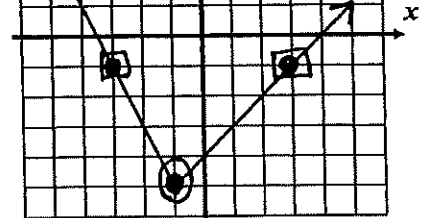__Algebra__

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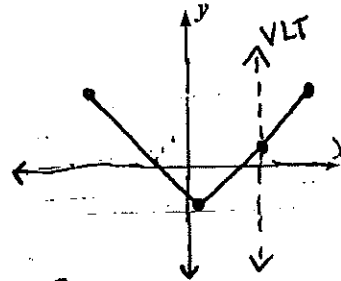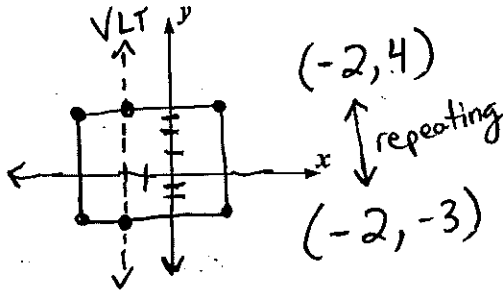
$$\left(\underline{-1} , \underline{-5} \right)$$

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 represents functions? Explain how you arrived at your choice.

VLT

(-2,4)
↑ repeating
(-2,-3)

draw a non-function

Explain: __repeating x values__

VLT

draw a function

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 $1 \le x \le 5$

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

x	g(x)
1	2
5	34

$4 < \overset{\longrightarrow}{} 32$

$\frac{32}{4}$

Average rate of change for g(x)

Average 8
Rate
of
change g(x)

-12A-
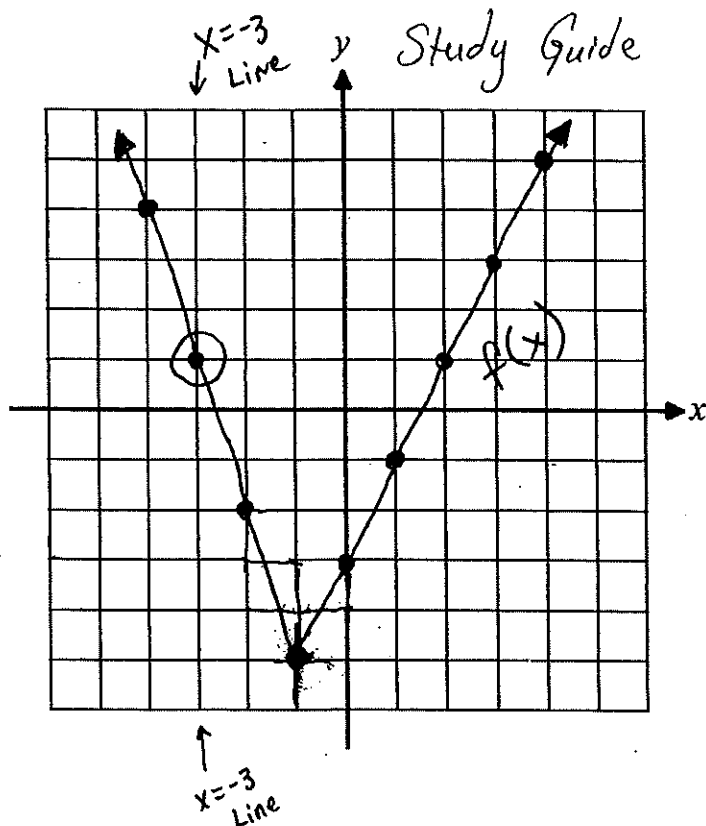
15. Graph the piecewise function shown below on the axes provided. Which point below is on the graph?

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

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 $f(-3)$?

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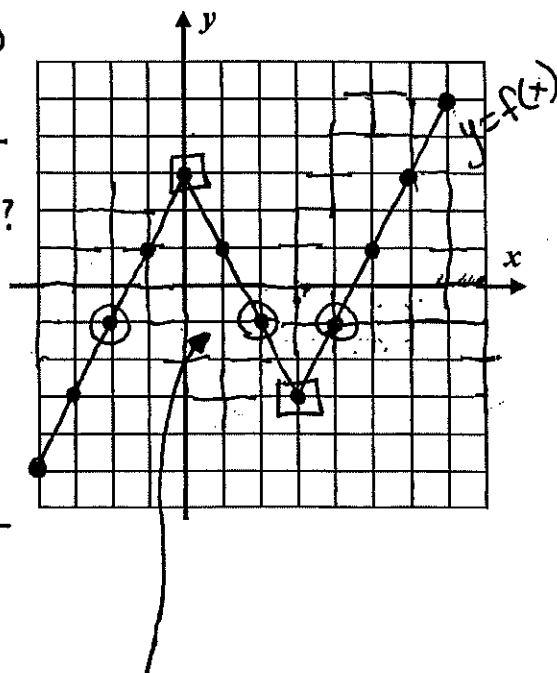

↑
$x=-3$ Line

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

$\underline{-4} \le x \le \underline{7}$ $\underline{-5} \le f(x) \le \underline{5}$

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 $f(x)=-1$

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

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.

$\underline{0} \le x \le \underline{3}$

decreasing interval

Look at the □ on the graph

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

$(0,3)$ $(3,-3)$
 x   x

from Left to right it is going __down__.

-128-

PART I QUESTIONS: Show all of your work.

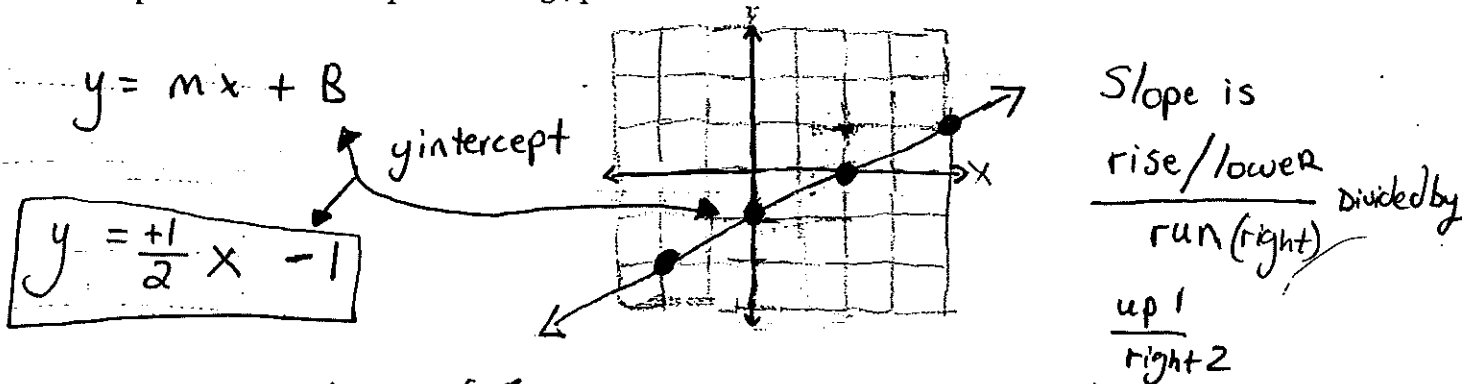1. Which of the following is the slope of the line that passes through the points $(-4, -6)$ and $(1, 9)$

$$m = \frac{y_1 - y_2}{x_1 - x_2} = \frac{(-6) - (9)}{(-4) - (1)} = \frac{-15}{-5} = \boxed{3} \leftarrow \text{slope}$$

$x_1 \; y_1 \qquad x_2 \; y_2$

$$\frac{x \;|\; y}{-4 \;|\; -6}$$
$$1 \;|\; 9$$

$$\frac{15}{5} = \boxed{3}$$

2. Which equation could correspond to the graph of the linear function shown below?

$$y = mx + B$$

y intercept

$$\boxed{y = \frac{+1}{2}x - 1}$$

Slope is

$$\frac{\text{rise}/\text{lower}}{\text{run (right)}} \text{ divided by}$$

$$\frac{\text{up } 1}{\text{right } 2}$$

3. A wheel with a specific circumference will move 540 inches when rolled 20 times. How far will the same wheel move, to the nearest inch, in 9 rolls?

$$y = Mx$$
$$y = (27)(9)$$
$$y = \underline{243}$$

$$\frac{x \;|\; y}{9 \;|\; 243}$$
$$20 \;|\; 540$$

$$M = \frac{540}{20} = 27 \text{ inches per roll}$$

243 inches after 9 rolls.

4. A line with a slope of -3 passes through the point $(4, -5)$. Which of the following is the equation of the line?

$x \quad y$

$$y = mx + b$$
$$y = -3x + b$$
$$(-5) = -3(4) + b$$
$$-5 = -12 + b$$
$$+12 \qquad +12$$
$$7 = b$$

$$y = mx + b$$
$$y = -3x + b$$
$$\boxed{y = -3x + 7}$$

-15A-

5. A rental car company charges a base fee of #25 plus $29¢$ per mile driven. Which of the following equations models the charge y for renting a car based on the number of miles, X, driven?
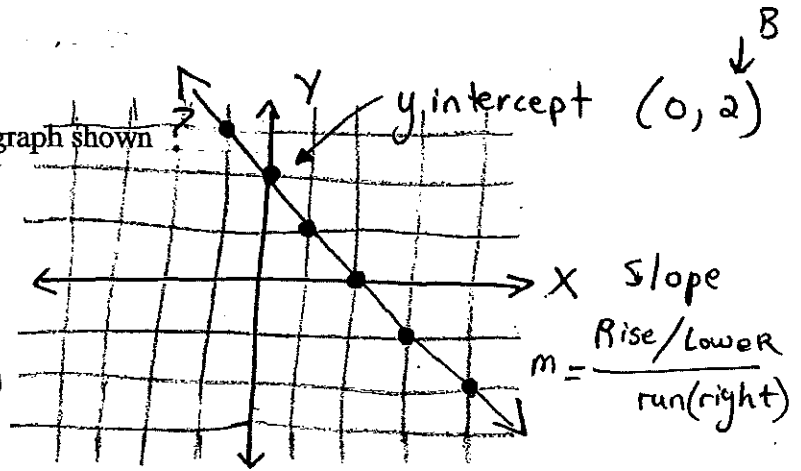
$$y = m \cdot x + B$$
$$y = 0.29x + 25$$

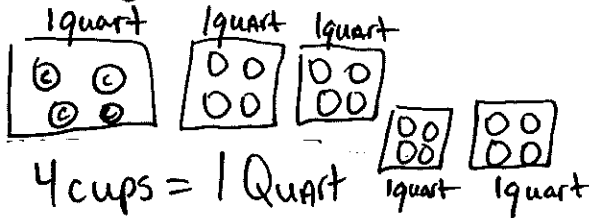6. Which of the following is the equation of the graph shown?

$$y = mx + B$$
$$y = -1x + 2$$

$$\frac{down\ -1}{right\ 1} = m$$

y intercept $(0, 2)$ $\quad \downarrow B$

X slope

$m = \dfrac{Rise/Lower}{run(right)}$

7. Charles is making a recipe that calls for 5 quarts of milk. Unfortunately, Charles only has a single cup measuring device. If there are two cups in a pint and two pints in a quart, then how many cups will Charles need for 5 quarts of milk?

1 quart   1 quart   1 quart

4 cups = 1 Quart   1 quart   1 quart

X	y
0	0
1	4
2	8
3	
4	16
5	20

5 quarts

cups
$4 + 4 + 4 + 4 + 4 = 20$

8. Which of the following equations describes all points on a vertical line that passes through the point $(-4, 8)$

↑ goes through x Axis

So, $x = \underline{-4}$

x, y

9. A sequence is defined by the rule. If $f(x) = 4x + 2$. If $f(1) = 6$ then what does $f(7) = \underline{\quad}$?

$f(1) = 4(1) + 2$
$f(1) = 4 + 2$
$f(1) = 6$

$f(7) = 4(7) + 2$
$f(7) = 28 + 2$
$\boxed{f(7) = 30}$

$-15B-$

Name: Answer Key
Date: Unit 4 Study Guide

PART II QUESTIONS: Show all of your work.

10. If graphed in the coordinate plane, would the line $y = 3x + 6$ pass through the point $(-5, -9)$ Explain how you arrived at your answer.

$$(-9) = 3(-5) + 6 \qquad x, y$$
$$-9 = -15 + 6$$
$$-9 = -9 \quad True,$$

$(-5, -9)$ is a solution and is on the line and table

11. An arithmetic sequence has a B term of 6 and a M term of 8 What is its 3rd term? Show how you arrived at your answer.

The 3rd number is 30.

$B = \underline{6} \quad M = \underline{8}$

$f(3) = \underline{30}$

X	f(x)
0	6
1	14
2	22
3	30

$+8$ $+8$ $+8$

PART III QUESTIONS: Show all of your work

12. As a large truck fills its gas tank, the volume of gas, in gallons, can be modeled with the linear function $y = 7.1x + 5$, where y is the volume of gas and x is the number of minutes it has been filling. Give a physical interpretation for both the 7.1 and 5 parameters in the linear model. Use appropriate units in your explanation.

The truck started with 5 gallons of gas.

7.1 gallons of gas are being pumped per minute.

13. Write the equation of the line that passes through the points $(5, 6)$ and $(3, 8)$ Express your answer in simplest $y = mx + b$ form.

$x_1, y_1 \quad x_2, y_2$

$$y = -1x + B$$
$$(\ ) = -1 (\ ) + B \qquad y = mx + B$$
$$(6) = -1(5) + B \qquad y = -1x + B$$
$$6 = (-5) + B \qquad \boxed{y = -1x + 11}$$
$$+5 \quad (+5)$$
$$11 = B$$

X	Y
5	6
3	8

$+2$
-2

$$m = \frac{change \ in \ y}{change \ in \ x} = \frac{2}{-2} = \boxed{-1}$$

$-16A-$

14. Graph the line $y - 4x = -3$ on the axes provided.

$$+4x \quad +4x$$
$$y = 4x - 3 \qquad (0, -3)$$

$$\frac{up\,4}{right\,1} \leftarrow slope \qquad \uparrow start \; y\text{-intercept}$$
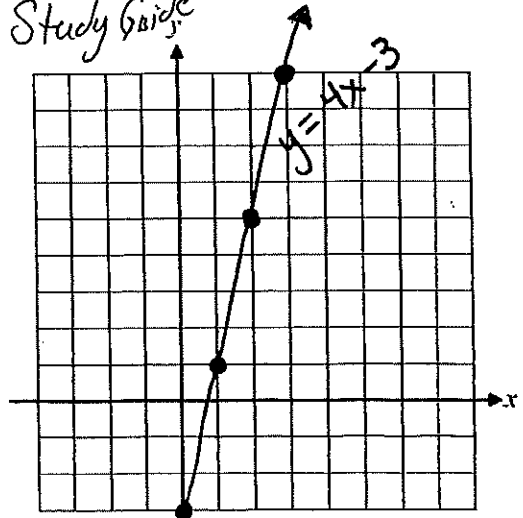
15. Use the graph from #14. At what value of y does the line have when $x = 2$? Show how you determined your answer.

$$y = 4x - 3$$
$$y = 4(\;) - 3$$
$$y = 4(2) - 3$$
$$y = 8 - 3$$
$$\boxed{y = 5}$$

PART IV QUESTION: Show all of your work.

16. A company produces boxes of DVD's at a rate of 80 boxes per hour. They begin to produce boxes when they first open for the day and after 4 hours have 573 boxes in stock. How many boxes were in stock when they opened?

$$y = mx + B$$
$$y = 80x + B$$
$$(\;) = 80(\;) + B$$
$$(573) = 80(4) + B$$

$(4, 573)$
$\quad x \quad y$

The store opened with 253 Boxes

$$573 = 80(4) + B$$
$$573 = \boxed{320} + B$$
$$-320 \qquad -320$$

$$\boxed{253 = B}$$

17. Use the same company from problem #16. Write a linear model for the amount of boxes, y as a function of the number of hours since they opened, x. Use your model to predict the number of boxes in stock at the end of 9 hours of work.

$$y = mx + B$$
$$y = 80x + 253$$
$$y = 80(\;) + 253$$
$$y = 80(9) + 253$$
$$y = 720 + 253$$
$$y = 973$$

973 boxes will be at the company at the end of this day.

$-16B-$

COMMON CORE ALGEBRA I: UNIT #5 Study Guide

PART I QUESTIONS: Show all of your work.

1. Which of the following is the X-coordinate of the solution to the system shown below?
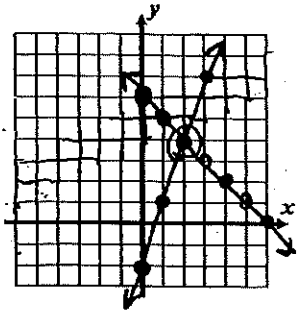
$X = \underline{5}$

$$2x + 3y = 18$$
$$4x - 3y = 12$$
$$6x \qquad = 30$$
$$\div 6 \qquad \div 6$$
$$x = 5$$

2. The line $y = 3x - 2$ Is graphed. **Graph the other line** $y = -x + 6$ Which of the following would be the y-coordinate of the solution when both lines are graphed?

$y = \underline{4}$

is the
Solution $(2, 4)$
$\quad x \quad y$

X	Y
0	6
1	5
2	4
3	3

3. Which of the following equations would have a solution that is the same as the solution to the system?

$5. x - 3y = -8$

$5(6) - 3(2) = -8$

$30 - 6 = -8$

$24 = -8$

Circle:
$True \; or \; \boxed{False}$

Solution
$(\underline{6}, \underline{2})$

(x, y)

Substitute
$4x + 7y = 38 \quad \boxed{x = 6}$

$4(6) + 7y = 38$

$24 + 7y = 38$
$-24 \qquad -24$

$7y = 14$
$\div 7 \qquad \div 7$
$\boxed{y = 2}$

4. Is $(4, 8)$ a solution to the system of equations?
$x \; y$

Both are True. So,
$(4, 8)$ is a Solution to
this system.

$y = 5x - 12 \qquad y = -3x + 20$

$(8) = 5(4) - 12 \qquad (8) = -3(4) + 20$

$8 = 20 - 12 \qquad 8 = -12 + 20$

$8 = 8 \qquad\qquad 8 = 8$
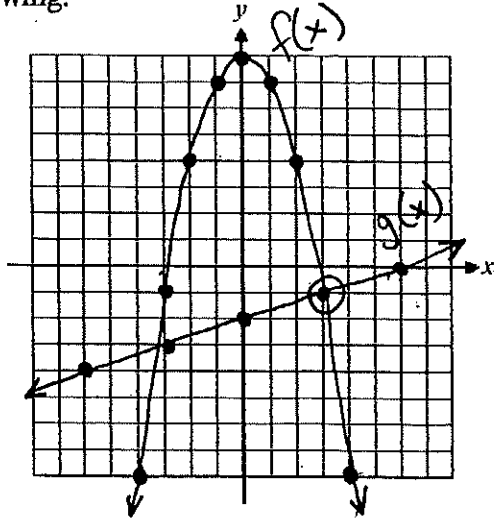
$True \qquad\qquad True$

-19A-

5. The quadratic functions $f(x) = -x^2 + 8$ and $g(x) = \frac{1}{3}x - 2$ are shown.

The positive solution to $f(x) = g(x)$ is which of the following.

Write a solution.

$\left(\underline{}_{3}, \underline{}_{-1}\right)$

↗ ↑
x value   y value

on both tables →

X	f(x)
-3	-1
-1	7
1	7
3	-1

X	g(x)
-3	-3
0	-2
3	-1
6	0

6. Which of the following points is a solution to the system of inequalities shown graphed below?

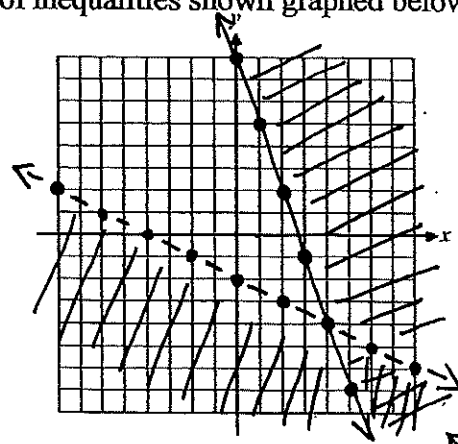↙ dotted and below Write a solution

$y < \frac{-1}{2}x - 2$

$y \geq -3x + 8$
↑
solid and above

$\left(\underline{}_{7}, \underline{}_{-7}\right)$

↑   ↗
Is this point in
the double shaded?

$\underline{\text{Yes}}$

← Many different
Answers

7. Which of the following is the value of y that solves the system of equations shown below?

$5x + 6y = 51 \qquad y = 2x$

$5x + 6(2x) = 51$

$5x + 12x = 51$

$17x = 51$

$\div 17 \qquad \div 17$

$\boxed{X = 3}$

$y = 2(3)$

$\boxed{y = 6}$

$\boxed{(3, 6)}$

8. At what point do the lines $y = 2x - 5$ and $y = -2x + 3$ intersect? Show Mr. V the calculator.

$2x - 5 = -2x + 3$

$+2x \qquad\quad +2x$

$4x - 5 = 3$

$+5 \qquad +5$

$4x = 8$

$\div 4 \quad \div 4$

$\boxed{X = 2}$

$y = 2x - 5$

$y = 2(2) - 5$

$y = 4 - 5$

$y = -1$

$\boxed{(2, -1)}$

- 19B -

PART II QUESTIONS: Show all of your work. *Key* *Unit 5 Study Guide*

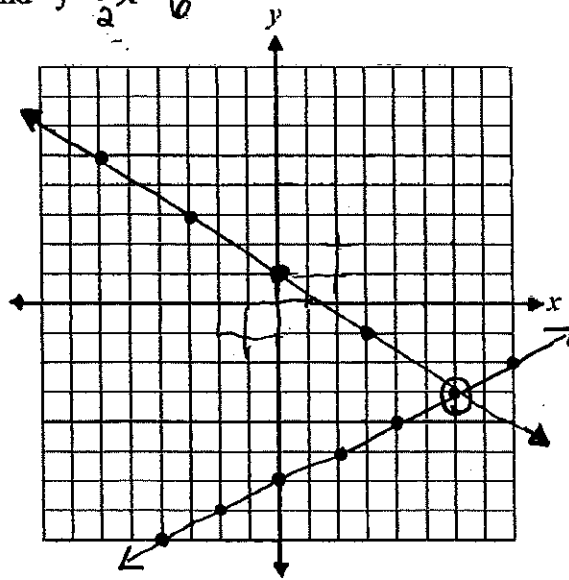9. Find the value of x that solves the system shown below. Show the work that leads to your answer.

$$(-6, -18)$$
$$\quad x \quad y$$

The point $(-6, -18)$ is the Solution.

$X = -6$ is the x-value of the Solution.

$y = 3x$ and $2x + y = -30$

$y = 3(-6)$

$y = -18$

$2x + (3x) = -30$

$5x = -30$

$\div 5 \quad \div 5$

$\boxed{x = -6}$

10. Graph the system of equations. $y = \frac{-2}{3}x + 1$ and $y = \frac{1}{2}x - 6$

11. What is the solution to #10?

intersection of the Lines $\left(\underline{6}, \underline{-3} \right)$

PART III QUESTIONS: Show all of your work.

12. Solve the following system of equations algebraically. foR the Solution.

$\left(\underline{6}, \underline{-5} \right)$

$5x + 2y = 20$

$5(6) + 2y = 20$

$30 + 2y = 20$

$-30 \qquad -30$

$2y = -10$

$\div 2 \qquad \div 2$

$\boxed{y = -5}$

$5x + 2y = 20$

$-2y - x = 4$

$4x = 24$

$\div 4 \qquad \div 4$

$\boxed{x = 6}$

-20A-

13. Sketch the graph to the system of inequalities shown below. Explain how to shade.

$y > 4x - 8$ and $y \leq \dfrac{-2}{3}x + 6$

(Dotted)
OR
Solid

X	Y
0	-8
2	0
4	8

Shade Above
OR
Below

Dotted
OR
(Solid)

X	Y
0	6
3	4
6	2

Shade Above
OR
(Below)
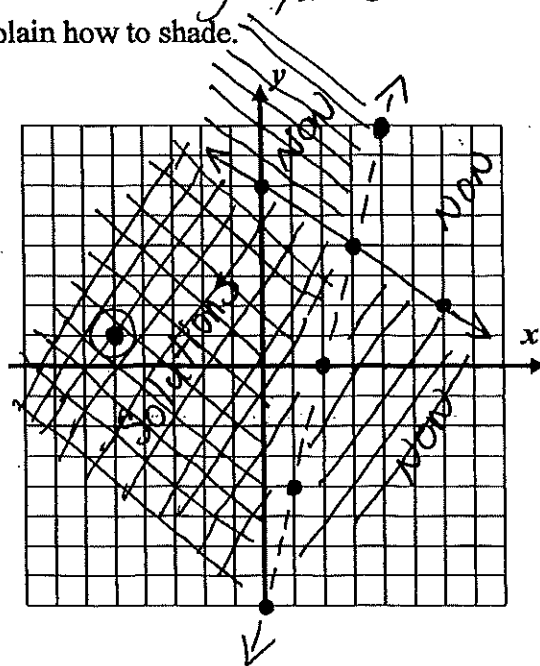
14. Graph the point $(-5, 1)$ Is it a solution to the system?   Circle   (Yes)   OR   No

Is it in the double shaded? ___yes___

15. The Poughkeepsie Drama Club is selling tickets to an upcoming play. They can sell 500 tickets. The adult tickets sell for $10 each and student tickets cost free_ They would like to raise $ 3,000 If x represents the number of adult tickets and y represents the number of student tickets, answer the following.
Write a system of equations that models this situation.

$$\underset{\substack{\text{number}\\\text{of}\\\text{adult}\\\text{tickets}}}{X} + \underset{\substack{\text{number}\\\text{of}\\\text{Student}\\\text{tickets}}}{Y} = \underset{\substack{\text{number}\\\text{of All}\\\text{tickets}}}{500}$$

$$\underset{\substack{\text{cost}\\\text{of}\\\text{1 Adult}\\\text{ticket}}}{10} \underset{\substack{\text{number}\\\text{of}\\\text{Adult}\\\text{tickets}}}{X} + \underset{\substack{\text{Cost}\\\text{of}\\\text{1 Student}\\\text{ticket}}}{0} \underset{\substack{\text{number}\\\text{of}\\\text{Student}\\\text{tickets}}}{y} = \underset{\substack{\text{Cost of}\\\text{All}\\\text{tickets}}}{3000}$$

16. A party is thrown where 20 tables are used. Each table either sits 8 people or 10 people. A total of 170 people can be sat at the tables. If E represent the number of 8 person tables and T represents the number of 10 person tables, write a system of equations that models this situation.

$$\underset{\substack{\text{Number of}\\\text{Eight person}\\\text{Tables}}}{E} + \underset{\substack{\text{Number of}\\\text{Ten person}\\\text{Tables}}}{T} = \underset{\substack{\text{Total number}\\\text{of}\\\text{tables}}}{20}$$

$$\underset{\substack{\text{number}\\\text{of}\\\text{Seats}\\\text{per}\\\text{one}\\\text{Eight}\\\text{person}\\\text{Table}}}{8} \underset{\substack{\text{number}\\\text{of}\\\text{Eight}\\\text{person}\\\text{Tables}}}{E} + \underset{\substack{\text{number}\\\text{of}\\\text{Seats}\\\text{per}\\\text{one}\\\text{Ten}\\\text{person}\\\text{Table}}}{10} \underset{\substack{\text{number}\\\text{of}\\\text{Ten}\\\text{person}\\\text{Tables}}}{T} = \underset{\substack{\text{Total seats}\\\text{in the}\\\text{room}}}{170}$$