Name Answer Key Date_____

Unit 3 Review HW#____

Solve the following system algebraically and check.

1. $y = 3x + 8$
$4x + 2y = 6$

$4x + 2(3x+8) = 6$
$4x + 6x + 16 = 6$
$10x + 16 = 6$
$-16 \quad -16$
$\frac{10x}{10} = \frac{-10}{10}$
$\boxed{x = -1}$

$y = 3(-1) + 8$
$y = -3 + 8$
$\boxed{y = 5}$
$(-1, 5)$

Ch
$5 = 3(-1) + 8$
$5 = -3 + 8$
$5 = 5$ ✓

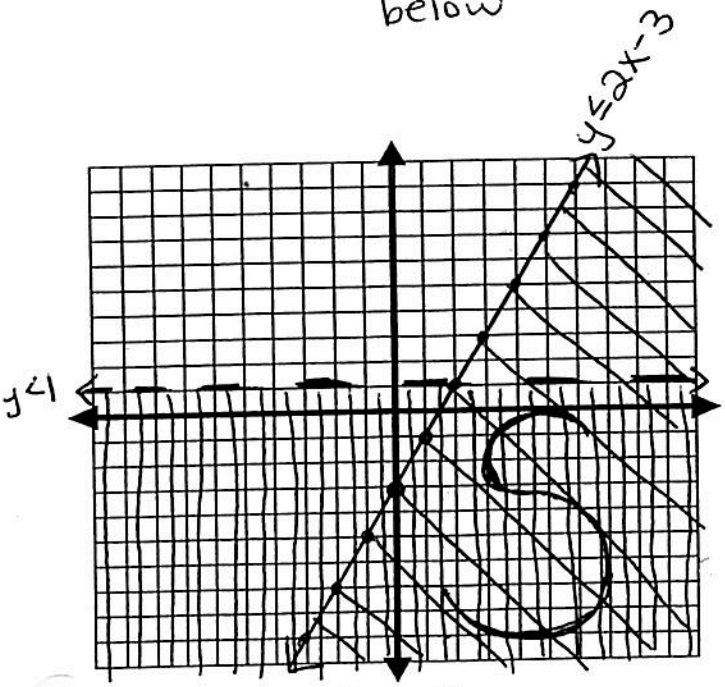
Ch
$4(-1) + 2(5) = 6$
$-4 + 10 = 6$
$6 = 6$ ✓

Solve the following systems of inequalities graphically and check.

2. $y < 1$ and $y \le 2x - 3$

horizontal dashed below

$m = \frac{2}{1}$
$b = -3$
solid below



$(4, 0)$

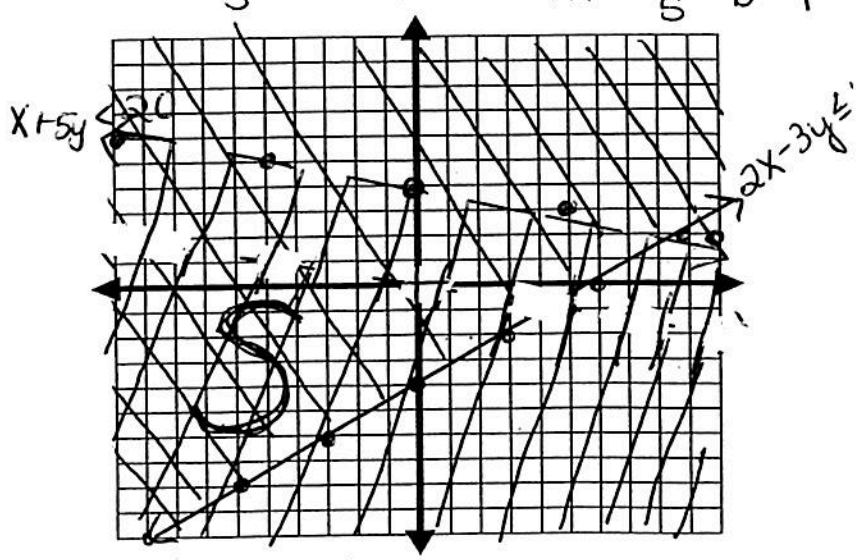
$y < 1$
$0 < 1$ ✓

$y \le 2x - 3$
$0 \le 2(4) - 3$
$0 < 8 - 3$

3. $2x - 3y \le 12$ and $x + 5y < 20$

$-2x \quad -2x$
$\frac{-3y}{-3} \le \frac{-2x}{-3} + \frac{12}{-3}$
$\boxed{y \ge \frac{2}{3}x - 4}$
$m = \frac{2}{3} \quad b = -4$

$-x \quad -x$
$\frac{5y}{5} < \frac{-x}{5} + \frac{20}{5}$
$\boxed{y < -\frac{1}{5}x + 4}$
$m = -\frac{1}{5} \quad b = 4$



$(-1, -2)$

$2(-1) - 3(-2) \le 12$
$-2 + 6 \le 12$
$4 \le 12$ ✓

$-1 + 5(-2) < 2$
$-1 - 10 < 20$
$-11 < 20$ ✓

Solve the following word problems algebraically. Be sure to include a legend, equations, and solution.

4. According to a recent report, John Paul Ofwono of Uganda is so tall he can pick mangoes without climbing a tree. John's height plus his father's height is 163 inches, while the difference in their heights is 33 inches. Assuming John is taller than his father, how tall is each man?

J = John's height
F = Father's height

$$J + F = 163$$
$$+\ J - F = 33$$
$$\frac{2J}{2} = \frac{196}{2}$$
$$\boxed{J = 98 \text{ in}}$$

$$98 + F = 163$$
$$-98 \quad -98$$
$$\boxed{F = 65 \text{ in}}$$

5. I have 30 coins of dimes and quarters that have a total value of $4.95. How many dimes and how many quarters do I have?

d = dimes
q = quarters

$$-10(d + q = 30)$$
$$10d + 25q = 4.95$$
$$10d + 25q = 495$$
$$-10d - 10q = -300$$
$$\frac{15q}{15} = \frac{195}{15}$$
$$\boxed{q = 13}$$

$$d + 13 = 30$$
$$-13 \quad -13$$
$$\boxed{d = 17}$$

6. At a local video rental store, Joe rents two movies and three games for a total of $15.50. At the same time, Meg rents three movies and one game for a total of $12.05. How much money is needed to rent <u>three games and one movie?</u>

m = movie
g = game

$$1(2m + 3g = 15.50)$$
$$-3(3m + 1g = 12.05)$$
$$-9m - 3g = -36.15$$
$$2m + 3g = 15.50$$
$$\frac{-7m}{-7} = \frac{-20.65}{-7}$$
$$\boxed{m = 2.95}$$

$$2(2.95) + 3g = 15.5$$
$$5.90 + 3g = 15.5$$
$$-5.90 \quad -5.9$$
$$\frac{3g}{3} = \frac{9.60}{3}$$
$$\boxed{g = 3.20}$$

* 3 games → 3(3.20) = 9.60
1 movie → + 2.95
$12.55

7. Currently, Tyrone has $60 and his sister has $135. Both get an allowance of $5 each week. Tyrone decides to save his entire allowance, but his sister spends all of hers each week.

Let x = # of weeks

a) Write one equation representing the spending of Tyrone.

$y = 5x + 60$

b) Write one equation representing the spending of his sister.

$y = -5x + 135$

8. The senior class is sponsoring a dance. The cost of a student disk jockey is $40 and tickets sell for $2 each.

Let x = # of tickets

a. Write a linear equation that represents the cost of a student disk jockey.

$y = 40$

b. Write a linear equation that represents the number of tickets sold.

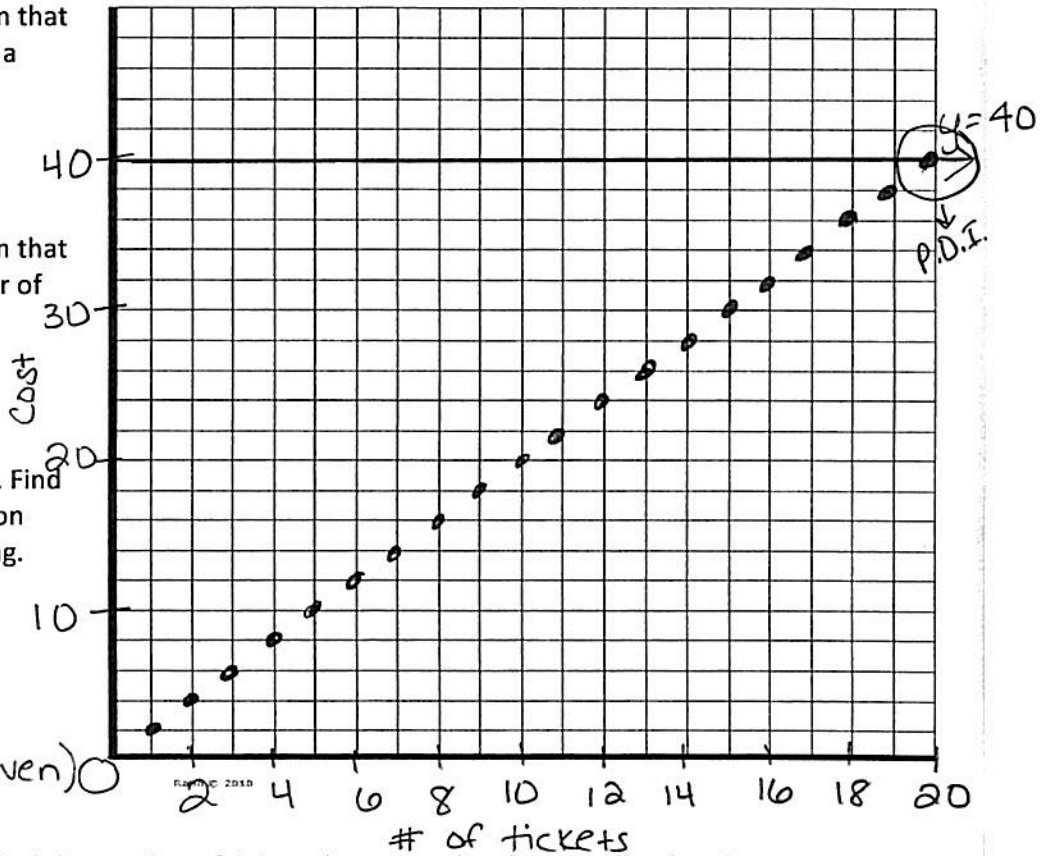
$y = 2x$

c. Graph both equations. Find the point of intersection and explain its meaning.

(20, 40)

If they sell 20 tickets, they will get $40.

(They will break even)



d. Solve algebraically to find the number of tickets the senior class has to sell to break even.

$y = 40$

$y = 2x$

↓

set them = to each other!

$\frac{2x}{2} = \frac{40}{2}$

$\boxed{x = 20 \text{ tickets}}$

e. A student claimed she sold $33 worth of tickets and her classmate exclaimed, "That's not possible!" Explain why.

No b/c there cannot be a "decimal" amount of tickets.

$\$\frac{33}{2} = 16.5$ tix

* $y = 2x$ has <u>finite</u> solutions. → do not connect line!

9. Which orders pair is *not* a solution of $4y < 3x + 5$? → plug in choices

a. (-3,-2)

b. (0,1)

c. $(\frac{1}{3}, \frac{3}{2})$

d. (1,1)

$4(\frac{3}{2}) < 3(\frac{1}{3}) + 5$

$6 < 1 + 5$

$6 < 6$ not true

10. Write an inequality for the following sentences.

a) Two less than five times a number is at least twelve. $5x - 2 \geq 12$

b) Four times a number is less than negative eight. $4x < -8$

c) The difference of 2 numbers is at most 40 $x - y \leq 40$

11. Using the substitution method, Ken solves the following system of equations algebraically.

$2x - y = 5$
$+y \quad +y$
$3x + 2y = -3$

→ $2x = 5 + y$
$-5 \quad -5$
$y = 2x - 5$

$3x + 2y = -3$

Which equivalent equation could Ken use?

a. $3x + 2(2x - 5) = -3$

b. $3x + 2(5 - 2x) = -3$

c. $3\left(y + \frac{5}{2}\right) + 2y = -3$

d. $3\left(\frac{5}{2} - y\right) + 2y = -3$

REMEMEBER TO CHECK YOUR ANSWERS WITH THE ANSWER KEY AND MAKE CORRECTIONS IN A DIFFERENT COLOR!!!