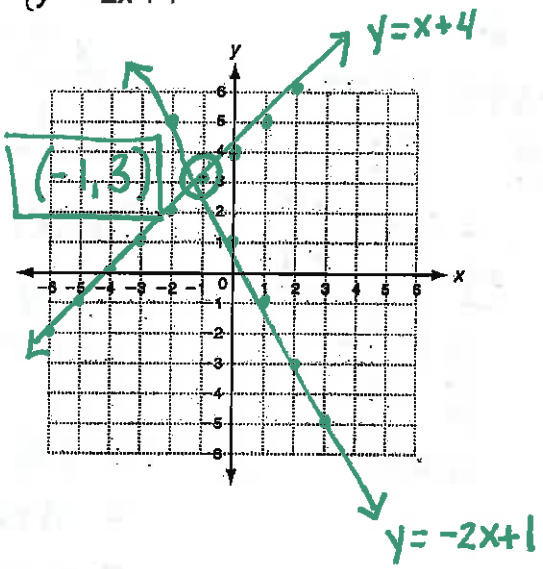
Name Teacher Key Date _____ Class _____

Final Exam Review: Chapter 5

Section 1 – Solving Systems by Graphing

Solve each system by graphing. Check your answer.

1. $\begin{cases} y = x + 4 \\ y = -2x + 1 \end{cases}$ Solution: (-1, 3)



$y = x + 4$

m = slope = $\frac{\text{rise}}{\text{run}}$ → assume 1

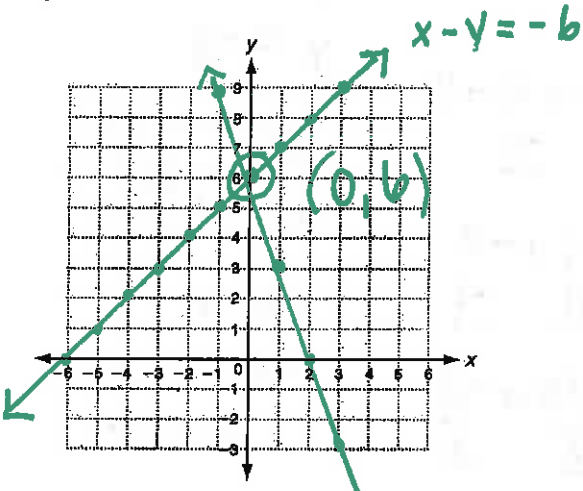
b (start on y-axis)

$y = -2x + 1$

$m = \frac{-2 \text{ rise (fall)}}{1 \text{ run}}$

b (start on y-axis)

2. $\begin{cases} x - y = -6 \\ 3x + y = 6 \end{cases}$ Solution: (0, 6)



$x - y = -6$

$-x \quad -x$

$\frac{-y}{-1} = \frac{-x}{-1} - \frac{6}{-1}$

$y = x + 6$

$m = 1$

$b = 6$

$3x + y = 6$

$-3x \quad -3x$

$y = -3x + 6$

$m = -3$

$b = 6$

Name _____ Date _____ Class _____

Section 2 – Solving Systems by Substitution

Solve each system by substitution. Check your answer.

3. $\begin{cases} y = x - 2 \\ y = 4x + 1 \end{cases}$

$y = x - 2$

$4x + 1 = x - 2$

$-x \quad -x$

$3x + 1 = -2$

$-1 \quad -1$

$\frac{3x}{3} = \frac{-3}{3}$

$x = -1$

$y = x - 2$

$y = -1 - 2$

$y = -3$

$(-1, -3)$

Check:

$-3 = -1 - 2$

$= -3$ ✓

$-3 = 4(-1) + 1$

$= -4 + 1$

$= -3$ ✓

4. $\begin{cases} y = x - 4 \\ y = -x + 2 \end{cases}$

$y = x - 4$

$-x + 2 = x - 4$

$+x \quad +x$

$2 = 2x - 4$

$+4 \quad +4$

$\frac{6}{2} = \frac{2x}{2}$

$x = 3$

$y = x - 4$

$y = 3 - 4$

$y = -1$

$(3, -1)$

Check:

$-1 = 3 - 4$

$= -1$ ✓

$-1 = -(3) + 2$

$= -3 + 2$

$= -1$ ✓

5. $\begin{cases} y = 3x + 1 \\ y = 5x - 3 \end{cases}$

$y = 3x + 1$

$5x - 3 = 3x + 1$

$-3x \quad -3x$

$2x - 3 = 1$

$+3 \quad +3$

$\frac{2x}{2} = \frac{4}{2}$

$x = 2$

$y = 3x + 1$

$y = 3(2) + 1$

$y = 6 + 1$

$y = 7$

$(2, 7)$

Check:

$7 = 3(2) + 1$

$= 6 + 1$

$= 7$ ✓

$7 = 5(2) - 3$

$= 10 - 3$

$= 7$ ✓

6. $\begin{cases} 2x + y = 8 \\ y = x - 7 \end{cases}$

$2x + (x - 7) = 8$

$3x - 7 = 8$

$+7 \quad +7$

$\frac{3x}{3} = \frac{15}{3}$

$x = 5$

$y = x - 7$

$y = 5 - 7$

$y = -2$

$(5, -2)$

Check:

$2(5) + (-2) = 8$

$10 + -2 =$

$✓8 =$

$(-2) = (5) - 7$

$= -2$ ✓

Name _____ Date _____ Class _____

Section 3 – Solving Systems by Elimination

Solve each system by elimination. Check your answer.

7. $\begin{cases} x + 3y = -7 \\ -x + 2y = -8 \end{cases}$

$+$

$5y = -15$

$\frac{5y}{5} = \frac{-15}{5}$

$y = -3$

$x + 3y = -7$

$x + 3(-3) = -7$

$x + -9 = -7$

$+9 \quad +9$

$x = 2$

$(2, -3)$

Check:

$(2) + 3(-3) = -7$

$2 + -9 =$

$\checkmark -7 =$

$-(2) + 2(-3) = -8$

$-2 + -6 =$

$\checkmark -8 =$

8. $\begin{cases} 3x + y = -26 \\ 2x - y = -19 \end{cases}$

$+$

$5x = -45$

$\frac{5x}{5} = \frac{-45}{5}$

$x = -9$

$3x + y = -26$

$3(-9) + y = -26$

$-27 + y = -26$

$+27 \quad +27$

$y = 1$

$(-9, 1)$

Check:

$3(-9) + (1) =$

$-27 + 1 =$

-26 ✓

$2(-9) - (1)$

$-18 - 1 =$

$\checkmark -19 =$

9. $\begin{cases} x + 3y = -14 \\ 2x - 4y = 32 \end{cases}$ $\times -2$

$-2x - 6y = 28$

$+ \quad 2x - 4y = 32$

$-10y = 60$

$\frac{-10y}{-10} = \frac{60}{-10}$

$y = -6$

$x + 3y = -14$

$x + 3(-6) = -14$

$x + -18 = -14$

$+18 \quad +18$

$x = 4$

$(4, 6)$

Check:

$(4) + 3(-6) = -14$

$4 + -18 =$

$\checkmark -14 =$

$2(4) - 4(-6) = 32$

$8 + 24 =$

$\checkmark 32 =$

10. $\begin{cases} -10x + y = 0 \\ 5x + 3y = -7 \end{cases}$ $\times -3$

$+30x - 3y = 0$

$+ \quad 5x + 3y = -7$

$\frac{35x}{35} = \frac{-7}{35}$

$x = -\frac{1}{5}$

$-10x + y = 0$

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

$-10x + y = 0$

$10x + 6y = -14$

$7y = -14$

$\frac{7y}{7} = \frac{-14}{7}$

$y = -2$

$5x + 3y = -7$

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

$5x - 6 = -7$

$+6 \quad +6$

$\frac{5x}{5} = \frac{-1}{5}$

$\left(-\frac{1}{5}, -2\right)$

Name _____ Date _____ Class _____

Section 4 - Solving Special Systems

Solve each system of linear equations.

1. $\begin{cases} y = 2x - 3 \\ y - 2x = -3 \end{cases}$

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

$-3 = -3$ ✓

Infinite Solutions

2. $\begin{cases} 3x + y = 4 \\ -3x = y - 7 \end{cases}$

$y = y - 3$

$-y \quad -y$

$0 = -3$

No Solution

3. $\begin{cases} y = -4x + 1 \\ 4x = -y - 6 \end{cases}$

$4x + y = -4x - y - 5$

$+4x \quad +y \quad +4x \quad +y$

$8x + 2y = -5$

$4x = -(-4x + 1) - 6$

$4x = 4x - 1 - 6$

$4x = 4x - 7$

$-4x \quad -4x$

$0 = -7$

No Solution

4. $\begin{cases} y - x + 3 = 0 \\ x = y + 3 \end{cases}$

$-y \quad -y$

$y - x + 3 = 0$

$-3 \quad -3$

$y - x = -3$

$x - y = 3$

$0 = 0$

Infinite Solutions

Section 5 - Solving Linear Inequalities

Tell whether the ordered pair is a solution of the given inequality.

Name x y _____ Date _____ Class _____

1. (1, 6); $y < x + 6$

$6 < 1 + 6$

$6 < 7$ ✓

Solution

2. (–3, –12); $y \geq 2x - 5$ (x y)

$-12 \geq 2(-3) - 5$

$-6 - 5$

$-12 \geq -11$ x

Not a Solution

3. (5, –3); $y \leq -x + 2$

$-3 \leq -(5) + 2$

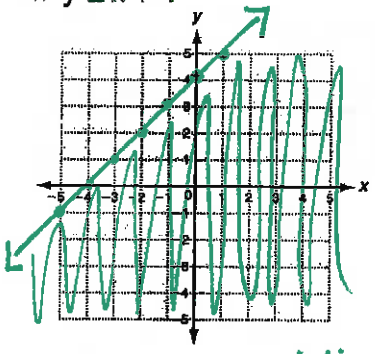
$-3 \leq -5 + 2$

$-3 \leq -3$ ✓

Solution

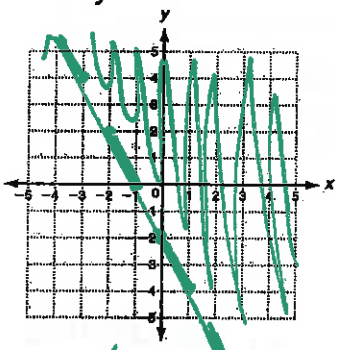
Graph the solutions of each linear inequality

4. $y \leq x + 4$



≤ : solid line
shade below

5. $2x + y > -2$



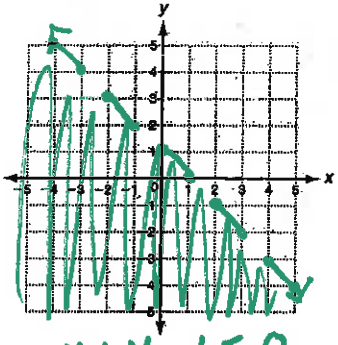
$2x + y > -2$

$-2x \quad -2x$

$y > -2x - 2$

> : dashed line
shade above

6. $x + y - 1 < 0$



$x + y - 1 < 0$

$-x \quad -x$

$y - 1 < -x$

$+1 \quad +1$

$y < -x + 1$

< : dashed line

7. Clark is having a party at his house. His father has allowed him to spend at most $20 on snack food. He'd like to buy chips that cost $4 per bag, and pretzels that cost $2 per bag. Shade below

a. Write an inequality to describe the situation.

$4x + 2y \leq 20$

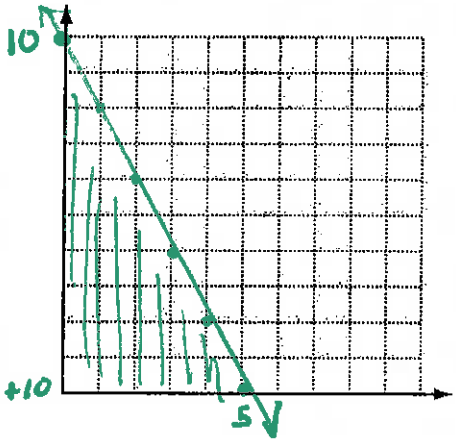
b. Graph the solutions.

$4x + 2y \leq 20$

$-4x \quad -4x$

$\frac{2y}{2} \leq \frac{-4x}{2} + \frac{20}{2}$

$y \leq -2x + 10$



c. Give two possible combinations of bags of chips and pretzels that Clark can buy.

(chip, pretzels)

(5, 0)

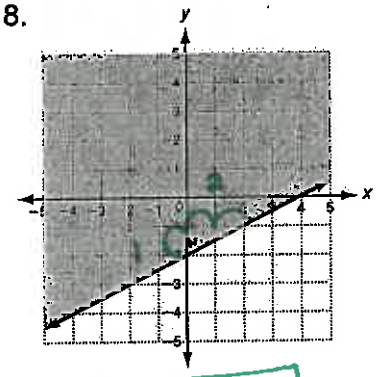
(0, 10)

(chips, pretzels)

Name _____ Date _____ Class _____

Write an inequality to represent each graph.

8.



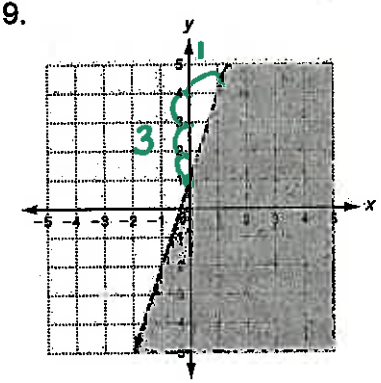
$y \geq \frac{1}{2}x - 2$

$m = \frac{1}{2}$ rise / run

$b = -2$ y-int.

$\geq$: solid line, shade above

9.



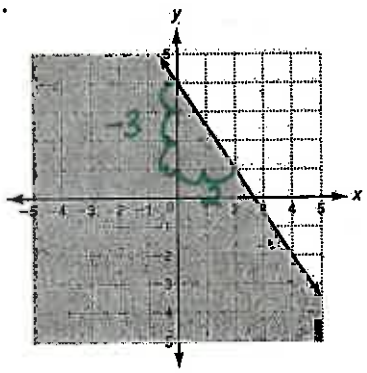
$y < 3x + 1$

$m = 3$

$b = 1$

$<$: dashed line, shade below

10.



$y \leq \frac{-3}{2}x + 4$

$m = \frac{-3}{2}$ fall / run

$b = 4$

$\leq$: solid line, shade below

Section 6 - Solving Systems of Linear Inequalities

Tell whether the ordered pair is a solution of the given system.

1. $(2, -2)$; $\begin{cases} y < x - 3 \\ y > -x + 1 \end{cases}$

x y

$-2 < 2 - 3$

$-2 < -1$ ✓

$-2 > -(2) + 1$

$-2 > -2 + 1$

$-2 > -1$ x

Not a Solution

2. $(2, 5)$; $\begin{cases} y > 2x \\ y \geq x + 2 \end{cases}$

$5 > 2(2)$

$5 > 4$ ✓

$5 \geq 2 + 2$

$5 \geq 4$ ✓

Solution

3. $(1, 3)$; $\begin{cases} y \leq x + 2 \\ y > 4x - 1 \end{cases}$

$3 \leq 1 + 2$

$3 \leq 3$ ✓

$3 > 4(1) - 1$

$3 > 4 - 1$

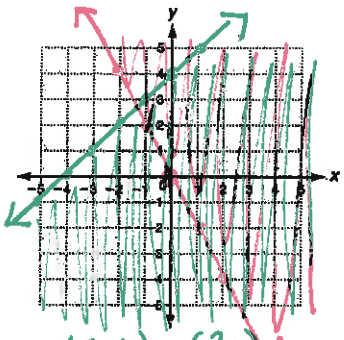
$3 > 3$ x

Not a Solution

Name _____ Date _____ Class _____

Graph the system of linear inequalities. a. Give two ordered pairs that are solutions. b. Give two ordered pairs that are not solutions.

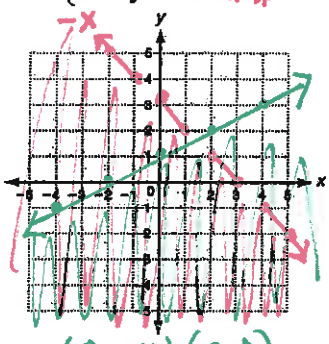
4. $\begin{cases} y \le x + 4 \\ y \ge -2x \end{cases}$



a. (2,0), (3,1)

b. (-1,0), (-2,5)

5. $\begin{cases} y \le \frac{1}{2}x + 1 \\ x + y < 3 \end{cases}$



a. (0,-4) (2,0)

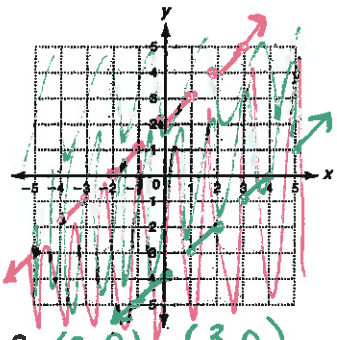
b. (0,3) (2,4)

$x + y < 3$

$-x \quad -x$

$y < -x + 3$

6. $\begin{cases} y > x - 4 \\ y < x + 2 \end{cases}$



a. (0,0) (3,0)

b. (3,-5) (-4,1)

7. Charlene makes $10 per hour babysitting and $5 per hour gardening. She wants to make at least $80 a week, but can work no more than 12 hours a week.

a. Write a system of linear equations.

$10x + 5y \ge 80$

$x + y \le 12$

$-x \quad -x$

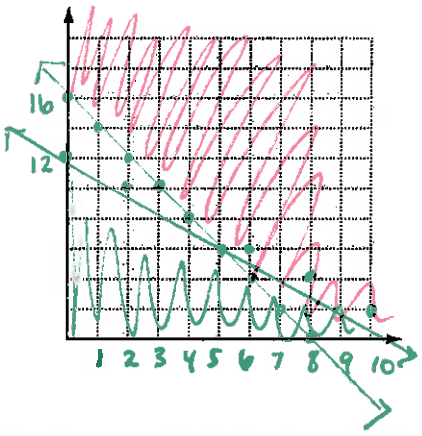
$y \le -x + 12$

$10x + 5y \ge 80$

$10x \quad -10x$

$\frac{5y}{5} \ge \frac{-10x + 80}{5}$

$y \ge -2x + 16$



b. Graph the solutions of the system.

c. Describe all the possible combinations of hours that Charlene could work at each job.

both overlap

d. List two possible combinations.

(8,0) (9,1)

Name _____ Date _____ Class _____