Name "Teacher" d 1/2 Date February 21, 2018 Section 2S11

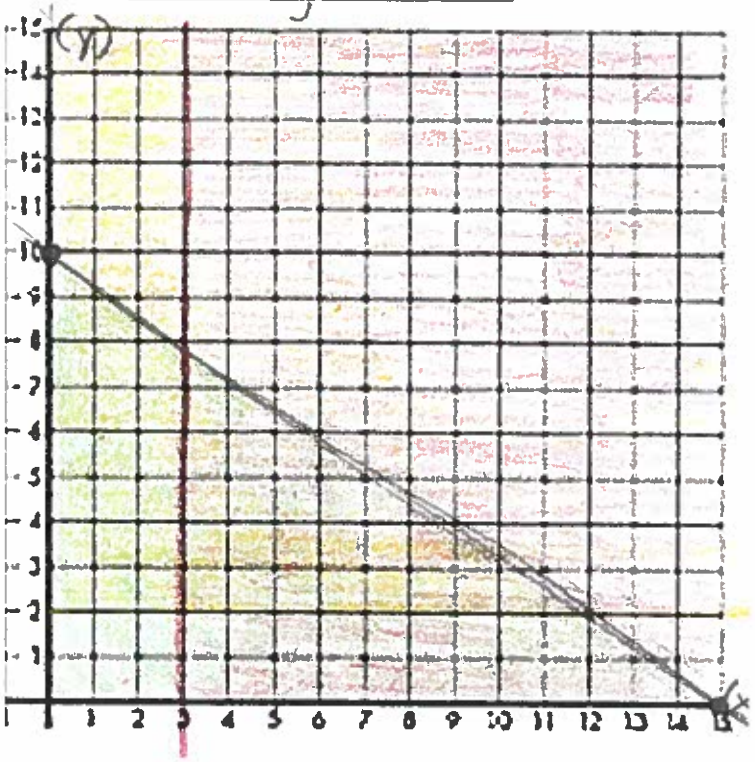
Systems of Linear Inequalities

(1) In order to prepare for a spring barbeque, you go to the supermarket to buy chicken and hamburgers. Hamburgers cost $2 per pound and chicken costs $3 per pound. You have no more than $30 to spend. Write and graph an inequality for the situation.

x Pounds of hamburgers
y Pounds of chickens

$2x + 3y \leq 30$
$2x + 3(0) \leq 30$
$\frac{2x}{2} \leq \frac{30}{2}$
$x \leq 15$

$2(0) + 3y \leq 30$
$\frac{3y}{3} \leq \frac{30}{3}$
$y \leq 10$



(2) You expect to buy at least 3 pounds of hamburgers. Write and graph an inequality (on the same graph) for the situation. VUX = Vertical

$x \geq$

(3) You plan to buy a minimum of 2 pounds of chicken. Write and graph an inequality (on the same graph) for the situation. Hoy = horizontal

$y \geq 2$

(4) What are two possible combinations of meat you could buy? How do you know?

(6, 4) and (5, 5) Those combinations are in the overlapping shaded region.

Multiple Choice Practice

Eighth graders are hosting a dance at the middle school. They would like to make at least $500 in profit from the event. They estimate that no more than 300 students will attend. They will earn $3 for every ticket purchased in advance and $4 for every ticket purchased at the door. Which system of inequalities represents the situation, if x is the number of advance tickets and y is the number of door tickets?

a. $x + y \geq 500$, $3x + 4y \leq 300$

b. $x + y \leq 500$, $3x + 4y \geq 300$

c. $x + y \geq 300$, $3x + 4y \leq 500$

d. $x + y \leq 300$, $3x + 4y \geq 500$

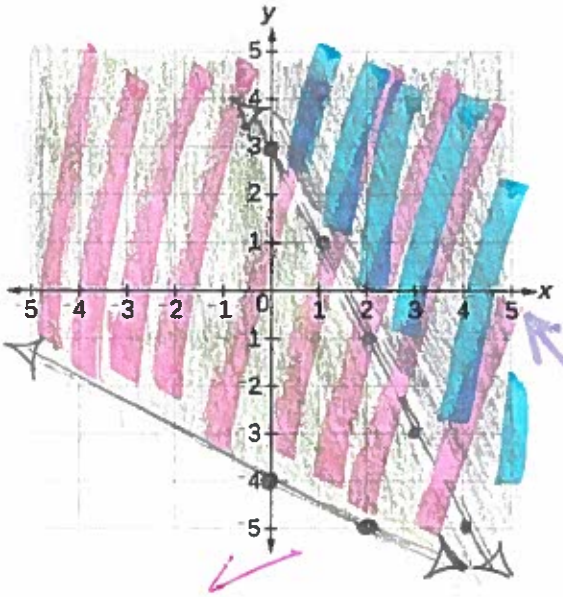
Solve the system of linear inequalities by graphing.

$y \geq -\frac{1}{2}x - 4$ $\quad -4x - 2y < -6$

$+4x \quad +4x$

$\frac{-2y}{-2} < \frac{4x - 6}{-2}$

$y > -2x + 3$



Is $(-2, -1)$ a solution to the system? Justify your answer graphically and algebraically.

(x, y)

not in overlap

$y \geq -\frac{1}{2}x - 4$

$(-1) \geq -\frac{1}{2}(-2) - 4$

$-1 \geq 1 - 4$

$-1 \geq -3$ ✓

$-4x - 2y < -6$

$-4(-2) - 2(-1) < -6$

$8 + 2 < -6$

$10 < -6$ ✗

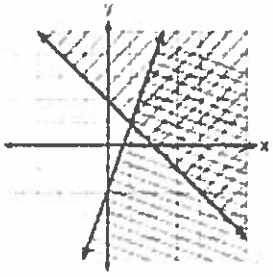
Key Ideas - *Don't forget!!*

Dotted lines:	Solid lines:	Shade above:	Shade below:
$<, >$	$\leq, \geq$	$>, \geq$	$<, \leq$

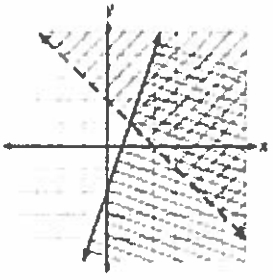
The solution set to a system of linear inequalities is the Overlapping Shaded region.

Every ordered pair in this region Makes both inequalities true statements.

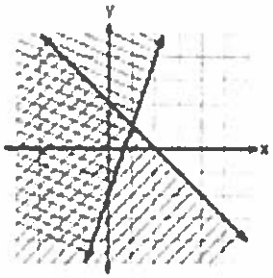
a.



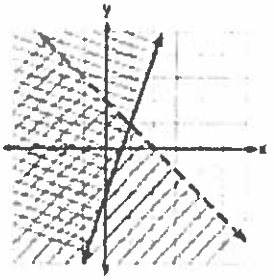
b.



c.



d.



Multiple Choice Practice

Which graph shows the solution set to the system of inequalities?

$y > -x + 2$

$y \leq 3x - 2$