WARM UP:

You are making chocolate chip cookies. The recipe calls for flour and brown sugar.

- You need at least 4 cups of flour.
- You need less than 2 cups of brown sugar.

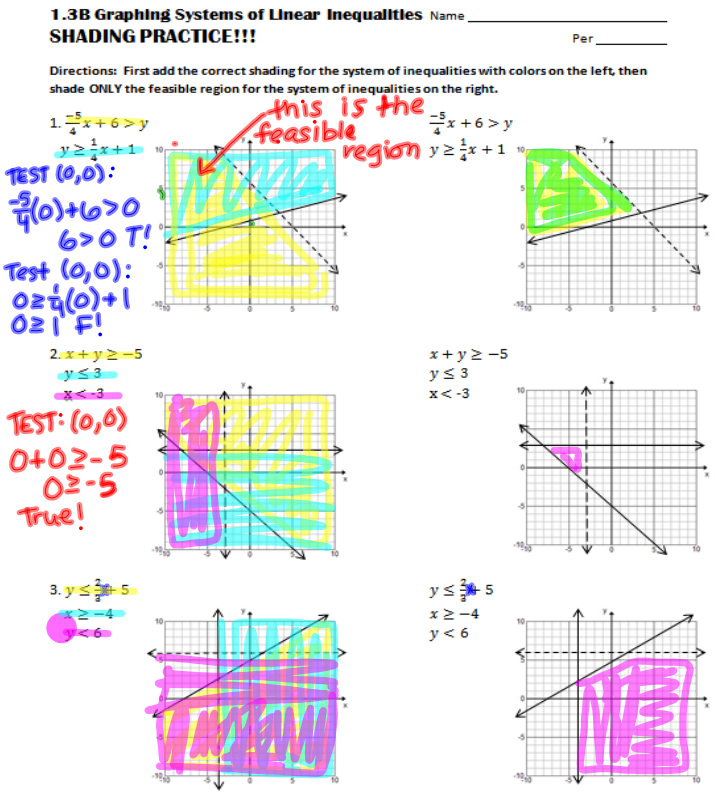
a.) Define the variables.

f: # of cups of flour
b: # of cups of brown sugar

b.) Write a system of inequalities to represent the constraints (restrictions) of the situation.

$f \geq 4$ $b < 2$

Shading Practice!!! Graphing Systems of Linear Inequalities



1.3B Graphing Systems of Linear Inequalities Name _____
SHADING PRACTICE!!! Per _____

Directions: First add the correct shading for the system of inequalities with colors on the left, then shade ONLY the feasible region for the system of inequalities on the right.

1. $\frac{-5}{4}x + 6 > y$
$y \geq \frac{1}{4}x + 1$

this is the feasible region

TEST (0,0):
$\frac{-5}{4}(0)+6>0$
$6>0$ T!
Test (0,0):
$0 \geq \frac{1}{4}(0)+1$
$0 \geq 1$ F!

$\frac{-5}{4}x + 6 > y$
$y \geq \frac{1}{4}x + 1$

2. $x + y \geq -5$
$y \leq 3$
$x < -3$

TEST: (0,0)
$0+0 \geq -5$
$0 \geq -5$
True!

$x + y \geq -5$
$y \leq 3$
$x < -3$

3. $y \leq \frac{2}{3}x + 5$
$x \geq -4$
$y < 6$

$y \leq \frac{2}{3}x + 5$
$x \geq -4$
$y < 6$

Learning Target: I can model real-world situations with equations and inequalities.

1.3C Linear Programming - Finding Vertices Graphically

Section 1.3C

Often, systems of linear inequalities deal with problems for which you are trying to find the best possible (**optimal**) situation given a set of constraints. Most of these applications fall in a category called **linear programming** problems.

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1) Cam is planning her spring planting and wants to find the number of acres of corn and wheat to plant to produce the most profit. Cam has the following constraints:

She wants to sell the combined corn and wheat crops for at least $9600. Farm reports predict revenue of $960 for each acre of corn and $800 for each acre of wheat.

Cam knows it takes at least 4 hours to plant each acre of corn and 2 hours to plant each acre of wheat. She has scheduled a minimum of 32 hours for planting the fields.

revenue: $ made

a) Write an inequality to represent the **revenue** constraint. Use *c* for the number of acres of corn and *w* for the number of acres of wheat.

$960c + $800w ≥ $9600

b) Write an inequality to represent the **number of hours to plant** constraint.

4c + 2w ≥ 32

c) Write two inequalities to represent that the number of acres of corn and the number of acres of wheat must be **non-negative**.

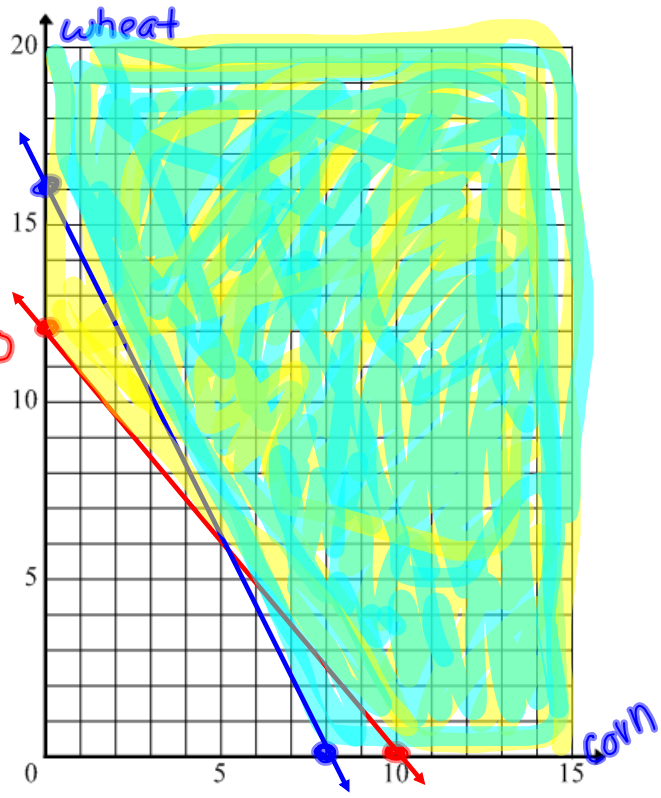
$c \geq 0,\ w \geq 0$

d) Label the axes of the graph.

e) Graph **the two inequalities** on the same grid and shade their solution areas. How do you determine which variable to put on the x-axis and which to put on the y-axis?

$\$960c + \$800w \geq \$9600$

$4c + 2w \geq 32$



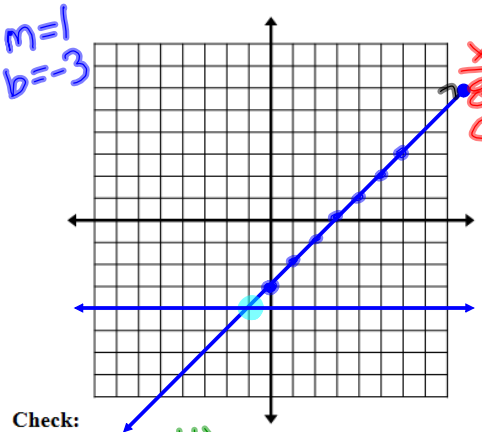
f) Describe the feasible region (the common solution area) for this system of inequalities. Be sure to reference key values from the graph.

meets constraints!

#2 – 3: Solve the systems of equations by graphing. Check your solution by showing that it works in each equation.

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

$m = 1$
$b = -3$



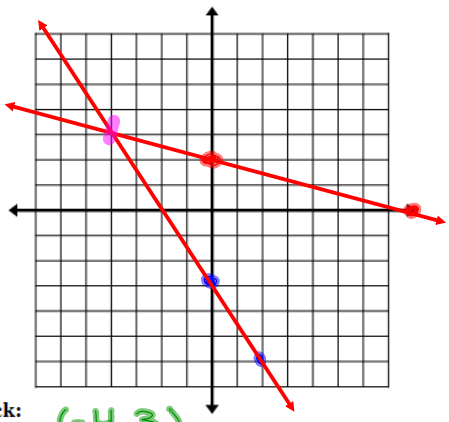
Check: $(-1, -4)$

$y = x - 3$
$-4 = -1 - 3$
$-4 = -4$ ✓

$y = -4$
$-4 = -4$ ✓

3) $\begin{cases} x + 4y = 8 \\ y = -\frac{3}{2}x - 3 \end{cases}$ solution: $(-4, 3)$

x	y
8	0
0	2



Check: $(-4, 3)$

$x + 4y = 8$
$-4 + 4(3) = 8$
$-4 + 12 = 8$
$8 = 8$ ✓

$y = -\frac{3}{2}x - 3$
$3 = -\frac{3}{2}(4) - 3$
$3 = 6 - 3$
$3 = 3$ ✓