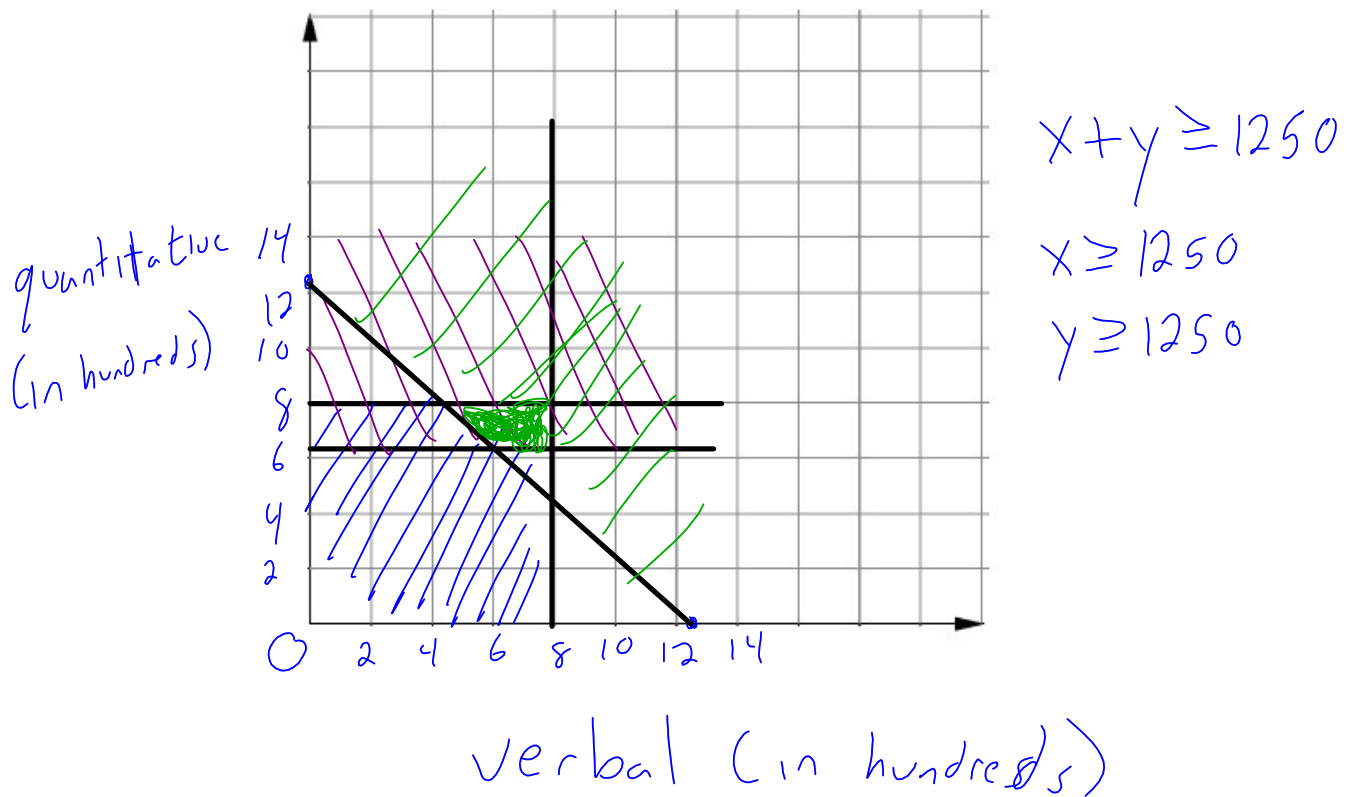


Section 2 – Topic 11
Systems of Linear Inequalities

The entrance exam to graduate college has two sections: a verbal reasoning section and a quantitative reasoning section. The exam has a maximum score of 1,600 for the entire test and maximums for each section of the test of 800. The school of your choice has set a minimum quantitative score of at least 625 and a total minimum score of 1250. Write a system of inequalities to model scores that meet the school's requirements and solve the system by graphing.

$$\begin{array}{ll} x = \text{verbal} & y = \text{quantitative} \\ x \leq 800 & y \leq 800 \\ x + y \geq 1250 & y \geq 625 \end{array}$$

Graph the region that represents the possible verbal and quantitative scores that will meet the school's requirements.



Let's Practice!

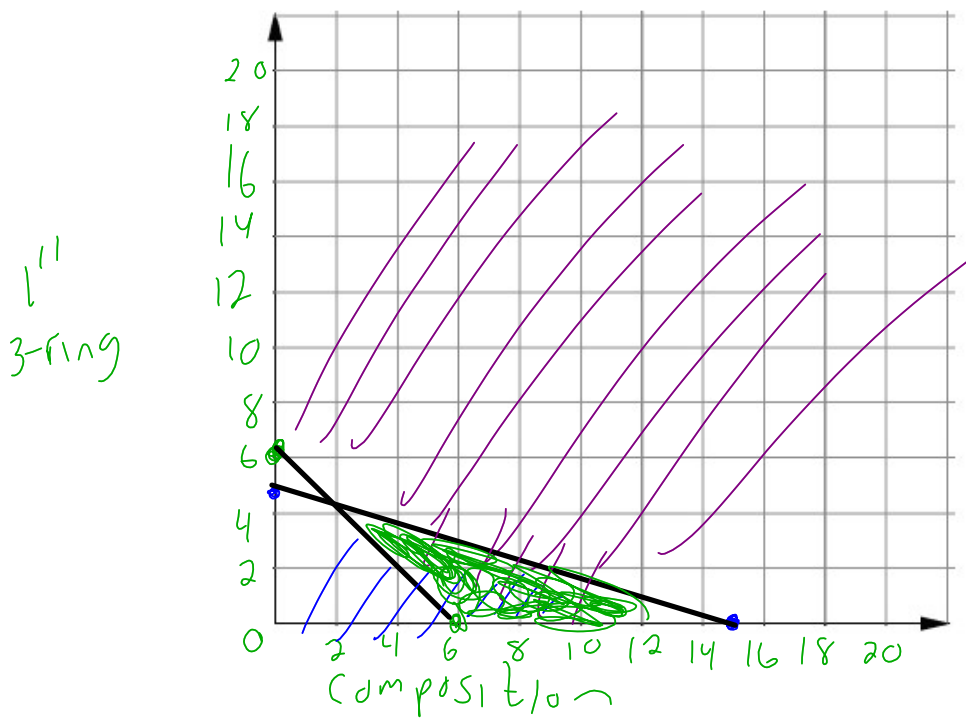
1. Suppose you are buying two kinds of notebooks for school. A composition book costs \$1, and a one-inch three-ring binder costs \$3. You must have at least 6 notebooks. The cost of the notebooks can be no more than \$15.

$x = \text{composition}$ $y = 1'' \text{ 3-ring}$

- a. Write a system of inequalities to model the situation.

$$\begin{aligned} x + y &\geq 6 & x + 3y &\leq 15 \\ x &\geq 6 & x &\leq 15 & 3y &\leq 15 \\ & & & & y &\leq 5 \end{aligned}$$

- b. Solve the system by graphing.



Try It!

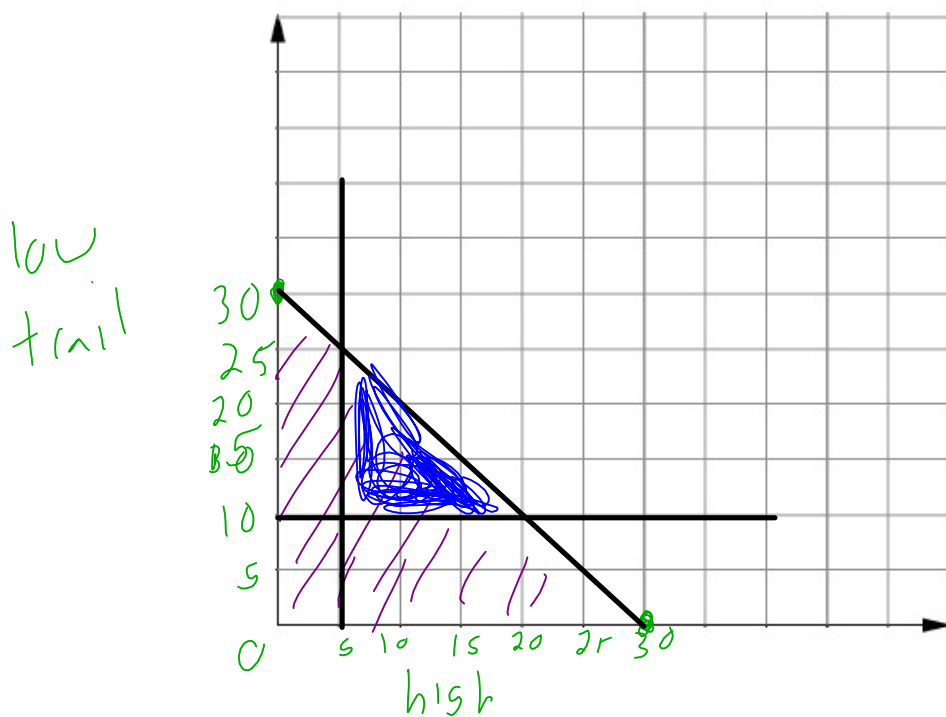
2. Chahua Camp Grounds provides mountain hikes. A camp counselor can take no more than 30 campers for hiking per day. Each day there is a low trail and high trail hike. The counselor must have a minimum of 10 campers on the low trail and a minimum of 5 campers on the high trail.

$x = \text{high}$ $y = \text{low}$

- a. Write a system of inequalities to model this situation.

$$\begin{aligned} x &\geq 5 & y &\geq 10 \\ x + y &\leq 30 \end{aligned}$$

- b. Solve the system by graphing.



BEAT THE TEST!

- Martha's Bakery is baking loaves of banana bread and poppy-seed almond bread. The recipe for one loaf of banana bread calls for two cups of flour and one teaspoon of baking soda. One loaf of poppy-seed almond bread requires $1\frac{1}{2}$ cups of flour and $2\frac{1}{2}$ teaspoons of baking soda. The bakery has 24 cups of flour and 26 teaspoons of baking soda in stock.

Part A: Write a system of linear inequalities to model how many loaves of bread can be baked.

$x = \text{banana}$ $y = \text{poppy seed}$
 flour $2x + 1.5y \leq 24$ $x + 2.5y \leq 26$

Part B: Graph the inequalities that represent how many loaves of each type of bread the bakers can make.

$2x \leq 24$
 $x \leq 12$
 $1.5y \leq 24$
 $y \leq 16$

baking soda
 $x \leq 26$
 $2.5y \leq 26$
 $y \leq 10.4$

poppy seed



Part C: Which of the following combinations can they make based on their current supply of flour and baking soda? Check all that apply.

- 1 banana bread and 5 poppy-seed almond breads
- 3 banana breads and 11 poppy-seed almond breads
- 6 banana breads and 8 poppy-seed almond breads
- 7 banana breads and 9 poppy-seed almond breads
- 9 banana breads and 5 poppy-seed almond breads

Part D: Do any of the combinations above use all the flour and baking soda? If so, write the combination below.

banana bread(s) and poppy-seed almond bread(s).