Sections 4.3, 4.6: Applications of Systems and Systems of Inequalities

Applications of Systems of Equations:

(1) The sum of two numbers is 140 and their difference is 8. Find the numbers

(2) A roll of 32 bills contains a mixture of \$5 bills and \$10 bills. If the total value of the roll is \$220, how much of each bill are in the roll?

(3) On day 1 of a two-day conference, Professor MG purchased 10 coffees and 10 donuts for \$20. No one drank the coffee, but all the donuts were eaten, so on day 2, Professor MG purchased 2 coffees and 14 donuts for \$13. How much did each coffee and each donut cost?

(4) The length of a rectangular plot of land is 255 yards longer than the width. If the total perimeter is 1206 yards, what are the dimensions of the rectangle?

(5) A debate team washed cars to raise money for a trip. They charged \$8 for large cars and \$5 for small cars. If they washed 80 cars and raised \$550, how much of each type did they wash?

(6) Malia is a customer service representative where she receives a weekly salary plus a commission (a percentage of her sales). During week 1, when her total sales were \$3500, she made \$1305. During week 2, when her total sales were \$2500, soe made \$1125. Determine what her base salary is and her commission rate.

Graphing Linear Inequalities

(1) Find the boundary line by replacing the inequality symbol with an = and graphing it.

(2) If the original inequality is $\geq$ or $\leq$, make the line solid. If it is $>$ or $<$, make it dashed.

(3) Select any point not on the boundary and plug it in to determine if it is a solution. Use this to shade in the side of the line that contains the correct solution set.

Examples: Graph the following inequalities

(1) $y < \frac{2}{3}x - 3$

(2) $y \geq -2x$

(3) $3x - 2y < -6$

Solving Linear Systems of Inequalities

(1) Graph each inequality on the same axes

(2) Determine where they overlap to find the solution set.

Examples: Solve the following systems

(1) $y < -\frac{1}{2}x + 2$
$x - y \leq 4$

(2) $2x + 3y \leq 6$
$y > \frac{2}{3}x$

(3) $y > -1$
$x \leq 4$