Assignment

Write

You have used three methods to solve systems: graphing, substitution, and linear combinations. Describe the characteristics you would look for when determining which method to use.

Remember

The solution set to a system of inequalities with more than two constraints can be described as the region where all the graphs overlap.

Practice

1. Antonio wants to subscribe to a service that will allow him to rent DVDs and stream movies online. Movie Madness offers a subscription for $14.25 a month. With this subscription, Antonio can check out as many DVDs as he wants each month and must pay $1.40 for each movie he streams online. The Show Must Go On! offers a subscription for $8.50 a month. With this subscription, Antonio can checkout as many DVDs as he wants each month and must pay $3.25 for each movie he streams online.
   a. Write a system of linear equations to represent this problem situation.
   b. Analyze the two subscription plans and determine which one is the better deal. Use any or all of the methods you have learned to determine your answer.
   c. Write a short paragraph recommending which subscription Antonio should choose.
   d. Which method do you think provides the quickest way to analyze a system of equations to determine which one is the better deal? Explain your reasoning.
2. The Brunstown Ballet Company needs to rent a venue for their production of the Nutcracker. There are a number of arenas they are considering. The arenas have seating capacities that range from 800 to 1876 seats. The management of the company knows the ticket sales may not be good this year but their goal is to sell between 65% and 90% of the available seats. Whichever arena they choose, one hundred seats must be set aside for the company's donors.
   a. Write a system of inequalities that represents the problem situation. Define your variables.
   b. Graph each inequality on a coordinate plane.
   c. One of the arenas they are considering has 1200 available seats. Determine the minimum and maximum number of seats they would need to sell in order for management to reach their goal.
   d. If the company sold 900 seats, what is the range of seating capacities for the arenas they may have rented?
   e. If they rented an arena that had a 1300-seat capacity and sold 800 tickets, would management reach their goal? Explain your reasoning.

Stretch

Isla sells baked good from her home kitchen. She offers decorated cookies for $15 per dozen and cupcakes for $13 per dozen. It takes her an hour to decorate a dozen cookies, but only 20 minutes to decorate a dozen cupcakes. She would like to make at least $300 per week and not put in more than 20 hours of work per week.

1. Create a system of linear inequalities that fits the situation and graph them.
2. Isla just discovered that she is running out of cake mix for the cupcakes and royal icing for the cookies. She can make a maximum of 40 dozen cupcakes and 12 dozen cookies. What are the new inequalities you need to add to your problem? Add them to your graph.
3. What is the maximum amount of baked goods that she could make? How much will she earn? How long will it take her?
4. What is the least amount of time she could work and still earn $300? What baked goods would she make?

Review

1. Consider the equation $6x - 2y = -12$.
   a. What is the slope of the equation?
   b. What are the intercepts of the equation?
2. The equation to calculate the area of a trapezoid is $A = \frac{1}{2}(a+b)h$. Rewrite the equation to solve for a.
3. Graph each system of inequalities. Then identify two points that are solutions of the system.
   a. $\begin{cases} y \geq 5x - 3 \\ y < -3x + 5 \end{cases}$
   b. $\begin{cases} y \geq x + 4 \\ x - y \geq 2 \end{cases}$
4. What is the equation for the line that has a slope of 0 and passes through the point (3, 7)?
5. What is the equation for the line that has a slope of $\frac{1}{5}$ and passes through the point $\left(-\frac{2}{3}, \frac{1}{2}\right)$?