Name _____ Class _____ Date _____

Chapter 6 Project: Let's Dance

Beginning the Chapter Project

Suppose you are the student council member that is responsible for planning a student dinner dance. Plans include hiring a band and buying and serving dinner. You want to keep the ticket price as low as possible to encourage student attendance.

As you work through the following activities, you will use systems of equations to analyze costs and make decisions. You will write a report detailing your choice of band, the cost of a catering service, and your ticket price recommendation.

List of Materials

- Calculator
- Graph paper

Activities

Activity 1: Graphing

Band A charges $600 to play for the evening. Band B charges $350 plus $1.25 for each ticket sold.

- Write a linear equation for the cost of each band.
- Graph each equation and find the number of tickets for which the cost of the two bands would be equal.

Activity 2: Calculating

A caterer charges a fixed cost for preparing a dinner plus an additional cost for each person served. You know that the cost for 100 students will be $750 and the cost for 150 students will be $1050. Find the caterer's fixed cost and the cost per student served.

Activity 3: Writing

Use your information from Activities 1 and 2. Assume that 200 students attend the dance.

- Write a report listing which band you would choose and the cost per ticket that you need to charge to cover expenses.
- Repeat the process assuming that 300 students attend.

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Activity 4: Graphing

In Activity 3, you found two ticket prices. Each price covers the cost of the dinner dance under certain conditions. Plan for between 200 and 300 people, that is $x > 200$ and $x < 300$.

- If your objective is to keep the ticket price as low as possible, even at the risk of not covering your costs, which ticket price would you select? Based on this choice, write a linear equation that gives the total amount collected for ticket sales. Change your equation to an inequality to indicate that this represents the least amount of money you expect to collect from ticket sales.
- If your objective is to be sure that you are able to cover the cost of the dinner dance, which ticket price would you select? Based on this choice, write a linear equation that gives the total amount collect for ticket sales. Change your equation to an inequality to indicate that this represents the greatest amount of money you expect to collect from ticket sales.
- The two inequalities you have written, along with $x > 200$ and $x < 300$, form a system of linear inequalities. Graph this system to show the total amount received from ticket sales.

Finishing the Project

The answer to the four activities should help you complete your project. Your report should include your analysis of the cost for dinner and each band, depending on how many people buy tickets. Include your recommended ticket price and note any conditions under which this ticket price leads to a loss for the event. Illustrate your reasoning with graphs of linear equations and inequalities.

Reflect and Revise

Present your analysis of this data to a small group of classmates. After you have heard their analyses and presented your own, check to see that your work is complete, clear, and convincing. If necessary, make changes to improve your presentation.

Extending the Project

Consider other expenses you could expect to have in planning and holding this dinner dance. Estimate the additional expenses and change your recommended ticket price as necessary.