

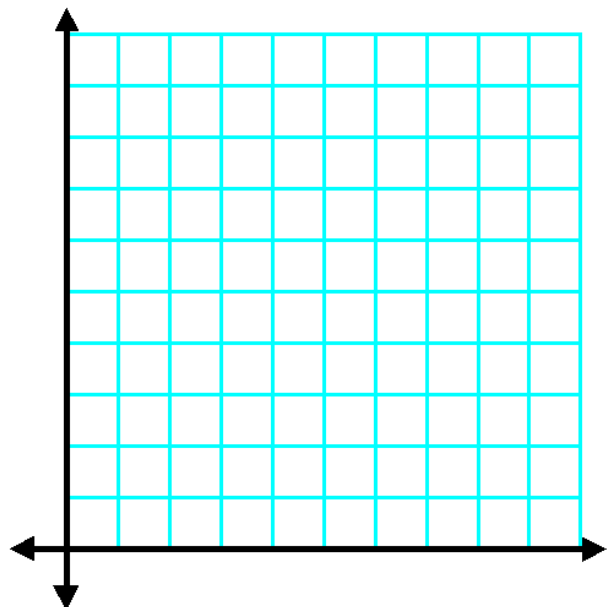
OBJECTIVE: You will be able to construct and solve a system of linear inequalities in the context of a problem-based situation.

1. You are the producer of a popular talk show that runs for thirty minutes. You are negotiating for appearances by the reggae group Steel Beat and by opera singer Lynn Peto. There are several conditions for their appearances. Both must appear on the show.

- As producer, you have a maximum of \$9000 to spend on entertainment for Monday's show. Steel Beat charges \$600 for each minute they play. Peto's performance fee is \$300 for each minute she sings.
- Eight minutes is reserved for the show's opening, closing and commercial segments. The remainder of the time is available for featured guests.
- Steel Beat will not appear on the show unless they are allowed to perform at least one number lasting at least three minutes.
- Lynn Peto will not appear unless she is allowed to perform at least as long as Steel Beat.

How long should you plan for each performance if you want to maximize performance time *and* minimize costs?

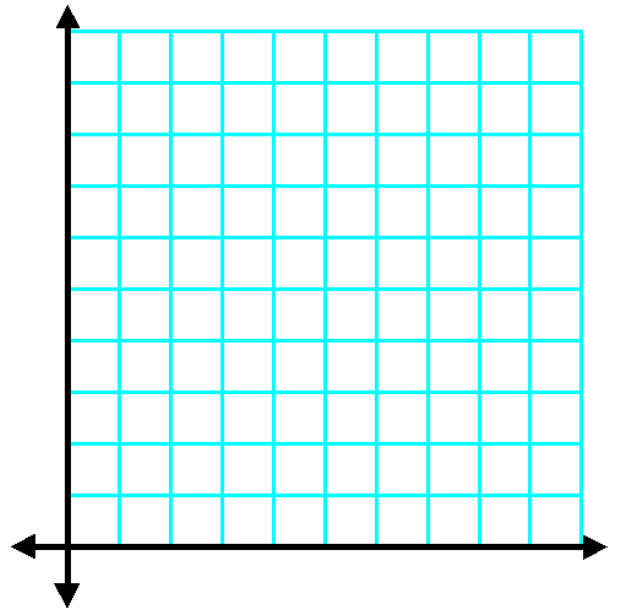
Remember to define your variables, list your constraints, graph the constraints, identify the vertices of the feasible region, state the objective function.



2. A store sells two kinds of bicycles, model A and model B. The store buys them unassembled from a wholesaler. Two employees are responsible for assembling the bicycles. Card Board can work no more than 12 hours per week. Bill Der is permitted to work no more than 21 hours per week. Working together to assemble model A, the employees work $\frac{3}{4}$ hour each. Model B requires $\frac{1}{2}$ hour's work by Card Board as well as 1 hour's work by Bill Der. There is a \$55 profit on each model A sold and \$48 on each model B. Because of the popularity of the sport, the store is able to sell as many bicycles as they decide to assemble. How many bicycles of each model should they assemble in order to get the maximum profit?

Remember to define your variables, list your constraints, graph the constraints, identify the vertices of the feasible region, state the objective function, and use the vertices to find the maximum profit.

Hint: There should be one constraint for each employee.



3. You have just been hired as manager of Peto's Pizza Company, which sells frozen pizzas to local markets. Peto's makes 12" pizzas for a profit of \$2 a box, and 16" pizzas for a profit of \$4 a box. Preparation and packaging take 0.14 hours for each box of 12" pizzas and 0.25 hours for each box of 16" pizzas. The staff at Peto's can put at most 140 hours into preparation and packaging per week, and must meet the company's weekly quota of producing at least 700 boxes of pizzas. The company also limits the number of 12" pizzas to no more than 600 each week. How many boxes of each type of pizza should you instruct the staff to make to maximize the profit?

Remember to define your variables, list your constraints, graph the constraints, identify the vertices of the feasible region, state the objective function, and use the vertices to find the maximum profit.

