Name _____

5-9B Lesson Master
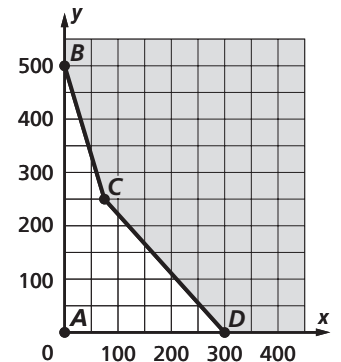
PROPERTIES   Objective E

1. **Multiple Choice** List all of the following shaded regions that could be the feasible region of a linear-programming problem. Explain your answer.

A   B   C   D
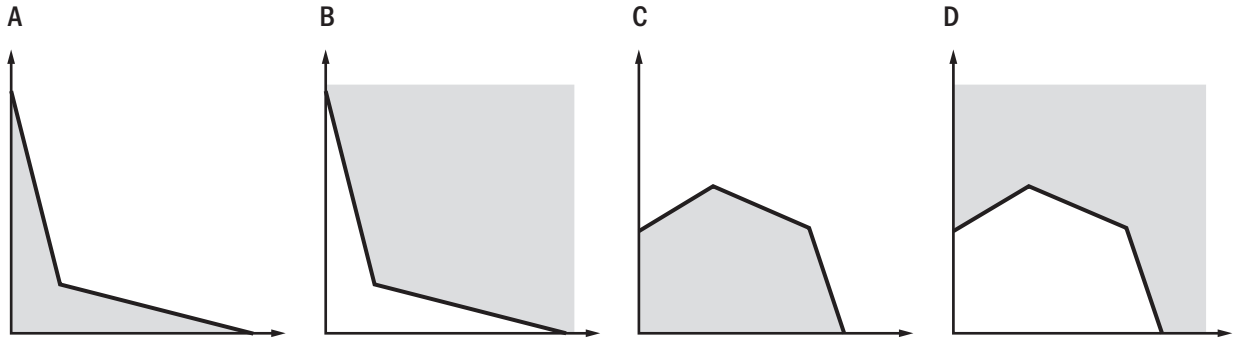
2. Use the graph at the right. It shows the feasible region of a linear-programming problem. Name the points which could be solutions to the problem.

   _____

USES Objective G

In 3–7, refer to the following situation: Justine makes jewelry to sell at a flea market. She can currently make a pair of earrings with 20 beads in 30 minutes and a necklace with 30 beads in 30 minutes. She plans to use no more than 600 beads, work a maximum of 12 hours (720 minutes), and make at least 5 pairs of earrings and 5 necklaces. Let e be the number of pairs of earrings and n be the number of necklaces she can make. The system of inequalities for this situation is shown below.

$$\begin{cases} 20e + 30n \le 600 \\ 30e + 30n \le 720 \\ \qquad\quad e \ge 5 \\ \qquad\quad n \ge 5 \end{cases}$$

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3. **Matching** Determine which inequality represents the given situation.

   A $20e + 30n \leq 600$ **B** $30e + 30n \leq 720$

   C $e \geq 5$ **D** $n \geq 5$

   a. the number of pairs of earrings _____

   b. the number of necklaces _____

   c. the total number of beads used _____

   d. the total number of minutes worked _____

4. At the right, graph the system of inequalities and determine the feasible region. Let e be the independent variable.

5. Give three possible combinations of earrings and necklaces Justine could make each week.

   _____

   _____

   _____

6. List the vertices of the feasible region.

   _____
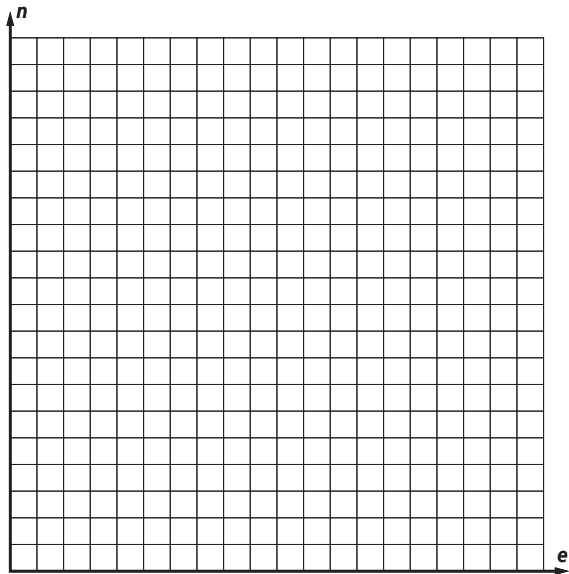
7. Justine makes $3.25 profit on each pair of earrings and $5 profit on each necklace. Assume she sells every piece of jewelry she makes.

   a. Write an expression for Justine's total profit in terms of e and n. _____

   b. Calculate the profits for your answers in Question 6.

   _____

   c. How many pairs of earrings and how many necklaces should Justine make to maximize the profit?

   Earrings _____   Necklaces _____

   d. What is the maximum amount of profit she can make? _____