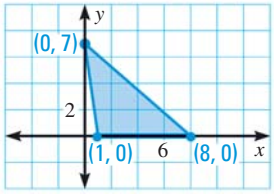
PRACTICE

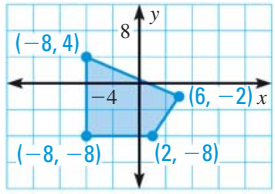
EXAMPLES 1 and 2 on p. 175 for Exs. 1–9

CHECKING VERTICES **Find the minimum and maximum values of the objective function for the given feasible region.**

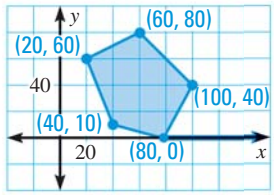
1. $C = x + 2y$



2. $C = 4x - 2y$



3. $C = 3x + 5y$



FINDING VALUES **Find the minimum and maximum values of the objective function subject to the given constraints.**

4. **Objective function:**
$C = 3x + 4y$

Constraints:
$x \geq 0$
$y \geq 0$
$x + y \leq 5$

5. **Objective function:**
$C = 2x + 5y$

Constraints:
$x \leq 5$
$y \geq 3$
$-3x + 5y \leq 30$

6. **Objective function:**
$C = 3x + y$

Constraints:
$x \geq 0$
$y \geq -2$
$y \geq -x$
$x - 4y \geq -16$

7. **CRAFT FAIR** Piñatas are made to sell at a craft fair. It takes 2 hours to make a mini piñata and 3 hours to make a regular-sized piñata. The owner of the craft booth will make a profit of $12 for each mini piñata sold and $24 for each regular-sized piñata sold. If the craft booth owner has no more than 30 hours available to make piñatas and wants to have at least 12 piñatas to sell, how many of each size piñata should be made to maximize profit?

8. **MANUFACTURING** A company manufactures two types of printers, an inkjet printer and a laser printer. The company can make a total of 60 printers per day, and it has 120 labor-hours per day available. It takes 1 labor-hour to make an inkjet printer and 3 labor-hours to make a laser printer. The profit is $40 per inkjet printer and $60 per laser printer. How many of each type of printer should the company make to maximize its daily profit?

9. **FARM STAND SALES** You have 180 tomatoes and 15 onions left over from your garden. You want to use these to make jars of tomato sauce and jars of salsa to sell at a farm stand. A jar of tomato sauce requires 10 tomatoes and 1 onion, and a jar of salsa requires 5 tomatoes and $\frac{1}{4}$ onion. You will make a profit of $2 on every jar of tomato sauce sold and a profit of $1.50 on every jar of salsa sold. The owner of the farm stand wants at least three times as many jars of tomato sauce as jars of salsa. How many jars of each should you make to maximize profit?

10. **CHALLENGE** Consider the objective function $C = 2x + 3y$. Draw a feasible region that satisfies the given condition.

a. C has a maximum value but no minimum value on the region.

b. C has a minimum value but no maximum value on the region.