

Practice C

For use with pages 163–169

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

1. **Objective function:**

$C = 2x - 3y$

Constraints:

$x \geq 0$

$y \geq 0$

$x + y \leq 4$

2. **Objective function:**

$C = x + 3y$

Constraints:

$x + 2y \leq 8$

$x - y \geq 0$

$y \geq 1$

3. **Objective function:**

$C = 3x + 2y$

Constraints:

$x \geq 0$

$y \geq 0$

$x + y \leq 4$

$x - y \geq -3$

4. **Objective function:**

$C = 5x - 2y$

Constraints:

$x \geq 0$

$y \geq 0$

$2x + y \leq 8$

$x + 3y \leq 9$

5. **Objective function:**

$C = 2x + y$

Constraints:

$x \geq 0$

$x \leq 3$

$\frac{3}{2}x - y \geq 0$

$3x + 2y \leq 12$

6. **Objective function:**

$C = 2x + 3y$

Constraints:

$x \leq 6$

$y \leq 5$

$-2x + 3y \leq 6$

$x + 3y \leq 6$

7. **Objective function:**

$C = 3x - y$

Constraints:

$y \leq 4$

$x + y \geq 2$

$2x - y \leq 4$

$-x + y \leq 2$

8. **Objective function:**

$x \geq -3$

Constraints:

$C = 6x + 3y$

$x + y \geq 0$

$-2x + y \leq 11$

$x + y \leq 11$

$-2x + y \geq 2$

9. **Objective function:**

$C = x - 5y$

Constraints:

$x \geq -3$

$y \geq -3$

$y \leq 6$

$-x + y \leq 6$

$3x - y \leq 6$

$x + y \geq -3$

10. **Gift Basket** You want to make a gift basket for your mother who is an avid reader. You decide to include hard cover books and paperbacks in the basket. You have \$80 to spend on books. Each hard cover costs \$24 and each paperback costs \$8. The basket will hold at most 3 hardcover books or 7 paperbacks. Find the maximum number of books you can include in the basket.
11. **Nutrition** You are planning to have roast pork and twice baked potatoes for dinner. You want to consume at least 250 grams of carbohydrates, but no more than 60 grams of fat per day. So far today you have consumed 170 grams of carbohydrates and 30 grams of fat. The table below shows the number of grams of carbohydrates, fat, and protein in a serving of roast pork and twice baked potatoes. How many servings of each can you eat to fulfill your daily requirements for carbohydrates and fat while maximizing the amount of protein you consume?

	<i>Pork</i>	<i>Potatoes</i>
carbohydrates	8 g	20 g
fat	6 g	7 g
protein	23 g	5 g