

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## 1.7 Solve Linear-Quadratic Systems

**BLM 1-9**

1. Determine the coordinates of the points of intersection of each linear-quadratic system algebraically.
  - a)  $y = -4x + 5$  and  $y = 3x^2 + 5x - 25$
  - b)  $y = 3x - 4$  and  $y = -4x^2 - 21x + 24$
2. Determine if each given quadratic function will intersect the given linear function once, twice, or not at all.
  - a)  $y = 2x + 8$  and  $y = x^2 - 2x - 4$
  - b)  $y = 4x + 7$  and  $y = -3x^2 + 9x + 1$
3. Determine the value of the  $y$ -intercept for the line with a slope of 3 that intersects each quadratic function at just one point.
  - a)  $y = \frac{1}{2}x^2 + 5x - 5$
  - b)  $y = -3x^2 + 2$
4. **Use Technology** Explain how you can check your solutions to question 2 using a graphing calculator. Use this method to check each solution to question 3.
5. A company that is about to start operations expects that the cost,  $C$ , in thousands of dollars, to produce  $x$  items per day will be given by the function  $C(x) = 5x^2 + 800x$ . The company also expects that the revenue function for  $x$  items per day will be given by  $R(x) = 1000x + 200$ , where  $R$  is revenue, in thousands of dollars. After how many items produced per day can the company expect to break even? (Hint: The break-even point is where a company's cost and revenue are the same.)
6. For what value(s) of  $k$  in  $y = 3x + k$  will the curve  $y = -x^2 - 3x + 6$ 
  - a) intersect the line at two points
  - b) intersect the line at one point
  - c) not intersect the line
7. **Use Technology** Verify your solutions to question 6 using a graphing calculator.
8. What two characteristics must exist for a line to be considered a tangent to a quadratic function?

