Unit 2 Project

Complete parts a-c for each quadratic function.

a. Find the *y*-intercept, the equation of the axis of symmetry, and the *x*-coordinates of the vertex.

b. Make a table of values that includes the vertex.

c. Use the information to graph the function.

1. $f(x) = -3x^2 + 8x$
2. $f(x) = 2x^2 + 7x + 1$

Determine whether each function has a maximum or minimum value. State the maximum or minimum value of each function.

3. $f(x) = x^2 + 6x + 9$
4. $f(x) = -x^2 + 4x$

5. Write a quadratic equation with roots -3 and 4 in standard form.

Solve each quadratic equation using the method of your choice. Find exact solutions.

6. $-1.6x^2 - 3.2x + 18 = 0$
7. $10x^2 + 3x = 1$
8. $x^2 + 8x - 48 = 0$

Simplify the expression.

9. $(5 - 2i) - (8 - 11i)$
10. $(14 - 5i)^2$

Write each equation in vertex form. Then identify the vertex, axis of symmetry, and direction of opening.

11. $y = x^2 + 10x + 27$
12. $y = -9x^2 + 54x - 8$

Graph each inequality.

13. $(x - 5)(x + 7) < 0$
14. $-5x^2 + x + 2 < 0$

Find the exact solution to the system of equations. Check your answer algebraically.

15. $y = x^2 - 6x + 1$
    $y + 2x = 6$
16. $2x^2 - 4x = y + 1$
    $x + y = 1$