

Complete parts a–c for each quadratic function.

- Find the y -intercept, the equation of the axis of symmetry, and the x -coordinate of the vertex.
- Make a table of values that includes the vertex.
- Use this information to graph the function.

- $f(x) = x^2 - 2x + 5$
- $f(x) = -3x^2 + 8x$
- $f(x) = -2x^2 - 7x - 1$

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

- $f(x) = x^2 + 6x + 9$
- $f(x) = 3x^2 - 12x - 24$
- $f(x) = -x^2 + 4x$

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

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

- $x^2 + x - 42 = 0$
- $-1.6x^2 - 3.2x + 18 = 0$
- $15x^2 + 16x - 7 = 0$
- $x^2 + 8x - 48 = 0$
- $x^2 + 12x + 11 = 0$
- $x^2 - 9x - \frac{19}{4} = 0$
- $3x^2 + 7x - 31 = 0$
- $10x^2 + 3x = 1$
- $-11x^2 - 174x + 221 = 0$

- BALLOONING** At a hot-air balloon festival, you throw a weighted marker straight down from an altitude of 250 feet toward a bull's-eye below. The initial velocity of the marker when it leaves your hand is 28 feet per second. Find out how long it will take the marker to hit the target by solving the equation $-16t^2 - 28t + 250 = 0$.

Simplify.

- $(5 - 2i) - (8 - 11i)$
- $(14 - 5i)^2$

Write each equation in vertex form, if not already in that form. Then identify the vertex, axis of symmetry, and direction of opening.

- $y = (x + 2)^2 - 3$
- $y = x^2 + 10x + 27$
- $y = -9x^2 + 54x - 8$

Graph each inequality.

- $y \leq x^2 + 6x - 7$
- $y > -2x^2 + 9$
- $y \geq -\frac{1}{2}x^2 - 3x + 1$

Solve each inequality using a graph, a table, or algebraically.

- $(x - 5)(x + 7) < 0$
- $3x^2 \geq 16$
- $-5x^2 + x + 2 < 0$

- PETS** A rectangular turtle pen is 6 feet long by 4 feet wide. The pen is enlarged by increasing the length and width by an equal amount in order to double its area. What are the dimensions of the new pen?

- MULTIPLE CHOICE** Which of the following is the sum of both solutions of the equation $x^2 + 8x - 48 = 0$?

- -16
- -8
- -4
- 12