

Without graphing, tell whether each point is on the graph of the given equation.

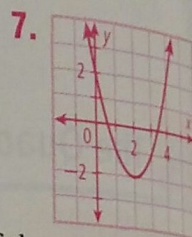
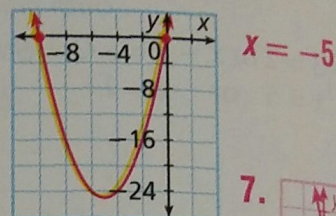
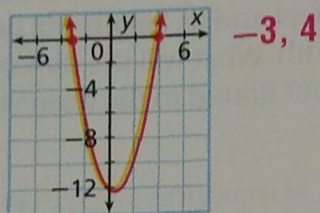
1.  $6 - 16x^2 = 2y$ ;  $(-1, -5)$  **yes**

2.  $3x^2 + y = 4 + 3x$ ;  $(2, 2)$  **no**

3. Tell whether the graph of  $y = -2x^2 + 7x - 5$  opens upward or downward and whether the parabola has a maximum or a minimum. **downward; maximum**

4. Find the zeros of the quadratic function from its graph.

5. Find the axis of symmetry of the parabola.



6. Find the vertex of the graph of  $y = x^2 + 6x + 8$ .  **$(-3, -1)$**

7. Graph  $y = x^2 - 4x + 2$ .

8. A rocket is launched with an initial velocity of 110 meters per second. The height  $h$  of the rocket in meters is approximated by the quadratic equation  $h = -5t^2 + 110t$ , where  $t$  is the time after launch in seconds. About how long after the launch does the rocket return to the ground? **about 22 s**

Solve each quadratic equation by factoring.

9.  $x^2 + 6x + 5 = 0$   **$-5, -1$**

10.  $x^2 - 12x = -36$  **6**

11.  $x^2 - 81 = 0$   **$\pm 9$**

Solve by using square roots.

12.  $-2x^2 = -72$   **$\pm 6$**

13.  $9x^2 - 49 = 0$   **$\pm \frac{7}{3}$**

14.  $3x^2 + 12 = 0$   **$\emptyset$**

Solve by completing the square.

15.  $x^2 + 10x = -21$   **$-7, -3$**

16.  $x^2 - 6x + 4 = 0$   **$3 \pm \sqrt{5}$**

17.  $2x^2 + 16x = 0$   **$-8, 0$**

18. A landscaper has enough cement to make a patio with an area of 150 square feet. The homeowner wants the length of the patio to be 6 feet longer than the width. What dimensions should be used for the patio? Round your answer to the nearest tenth of a foot. **9.6 ft by 15.6 ft**

Solve using the Quadratic Formula. Round to the nearest hundredth if necessary.

19.  $x^2 + 3x - 40 = 0$   **$-8, 5$**

20.  $2x^2 + 7x = -5$   **$-\frac{5}{2}, -1$**

21.  $8x^2 + 3x - 1 = 0$   
 **$\approx -0.59, \approx 0.21$**

Find the number of  $x$ -intercepts of each function by using the discriminant.

22.  $4x^2 - 4x + 1 = y$  **1**

23.  $y = 2x^2 + 5x - 25$  **2**

24.  $y = \frac{1}{2}x^2 + 8$   
**no  $x$ -intercepts**