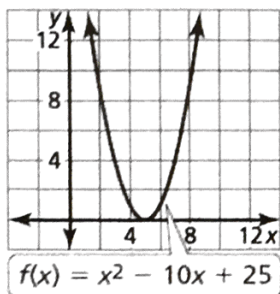


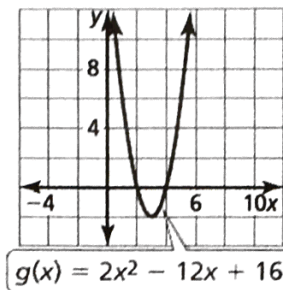
Solve the equation by using the graph. Check your solution(s). (Section 3.1)

1. $x^2 - 10x + 25 = 0$



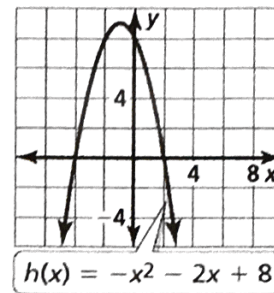
$x = 5$

2. $2x^2 + 16 = 12x$



$x = 2, 4$

3. $x^2 = -2x + 8$



$x = -4, 2$

Solve the equation using square roots or by factoring. (Section 3.1)

4. $2x^2 - 15 = 0$

$x = \pm \sqrt{\frac{15}{2}}$ or $\pm \frac{\sqrt{30}}{2}$

5. $3x^2 - x - 2 = 0$

$x = -\frac{2}{3}, 1$

6. $(x + 3)^2 = 8$

$x = -3 \pm 2\sqrt{2}$

Perform the operation. Write your answer in standard form. (Section 3.2)

7. $(2 + 5i) + (-4 + 3i)$

$-2 + 8i$

8. $(3 + 9i) - (1 - 7i)$

$2 + 16i$

9. $(2 + 4i)(-3 - 5i)$

$14 - 22i$

10. Find the zeros of the function $f(x) = 9x^2 + 2$. Does the graph of the function intersect the x-axis? Explain your reasoning. (Section 3.2)

$x = \pm \frac{i\sqrt{2}}{3}$; the graph of $f(x)$ does not intersect the x-axis because the zeros of $f(x)$ are imaginary.

Solve the equation by completing the square. (Section 3.3)

11. $x^2 - 6x + 10 = 0$

$x = 3 \pm i$

12. $x^2 + 12x + 4 = 0$

$x = -6 \pm 4\sqrt{2}$

13. Write $y = x^2 - 10x + 4$ in vertex form. Then identify the vertex. (Section 3.3)

$$y = (x-5)^2 - 21 ; \text{ vertex } : (5, -21)$$

14. A museum has a café with a rectangular patio. The museum wants to add 464 square feet to the area of the patio by expanding the existing patio as shown. (Section 3.1)

- a. Find the area of the existing patio.

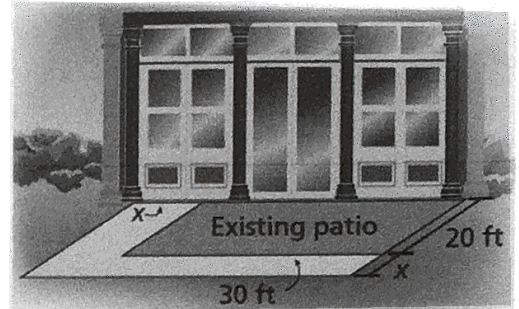
$$600 \text{ ft}^2$$

- b. Write an equation to model the area of the new patio.

$$(x+30)(x+20) = 600 + 464$$

- c. By what distance x should the length of the patio be expanded?

$$8 \text{ ft}$$



15. The height h (in feet) of a badminton birdie t seconds after it is hit can be modeled by the function $h = -16t^2 + 32t + 4$. (Section 3.3)

- a. Find the maximum height of the birdie.

$$20 \text{ ft.}$$

- b. How long is the birdie in the air?

$$2.12 \text{ seconds}$$