

3.1

Practice A

In Exercises 1–6, solve the equation by graphing.

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

2. $x^2 - 6x + 9 = 0$
 $x = 3$

3. $x^2 - 25 = 0$
 $x = 5, x = -5$

4. $x^2 - 4x - 12 = 0$
 $x = -2, x = 6$

5. $12 = x^2 - 4$
 $0 = x^2 - 16$
 $x = \pm 4$

6. $2x^2 - 3 = 5x$
 $x = 3, x = -\frac{1}{2}$

In Exercises 7–9, solve the equation using square roots.

7. $t^2 = 100$
 $t = \pm 10$

8. $g^2 = 64$
 $g = \pm 8$

9. $(y + 2)^2 = 16$
 $y + 2 = \pm 4$
 $y = 2, y = -6$

7. $(k - 3)^2 = 121$
 $k - 3 = \pm 11$
 $k = 14$
 $k = -8$

8. $3(x + 1)^2 - 4 = 5$
 $3(x + 1)^2 = 9$
 $(x + 1)^2 = 3$
 $x + 1 = \pm \sqrt{3}$
 $x = -1 \pm \sqrt{3}$

9. $\frac{4}{3}x^2 = \frac{2}{3}x^2 + 6$
 $\frac{2}{3}x^2 = 6$
 $x^2 = 9$
 $x = \pm 3$

10. Write an equation of the form $(x - a)^2 + b = d$ that has (a) two integer solutions, (b) two irrational solutions, and (c) no real solutions.

a) $(x - 4)^2 + 2 = 11$
 b) $(x - 4)^2 + 2 = 10$
 c) $(x - 4)^2 + 10 = 2$

11. Describe and correct the error in solving the equation.

$(x - 2)^2 = 9$
 $(x - 2) = \pm 3$
 $x = 5, x = -1$

X $(x - 2)^2 + 16 = 25$
 $x - 2 + 4 = \pm 5$
 $x + 2 = \pm 5$
 $x = -2 \pm 5$
 $x = 3$ and $x = -7$

In Exercises 12–18, solve the equation by factoring.

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

$$0 = (x-2)^2$$

$$x = 2$$

13. $x^2 + x = 6$

$$x^2 + x - 6 = 0$$

$$(x+3)(x-2) = 0$$

$$x = -3 \quad x = 2$$

14. $m^2 + 4m = 0$

$$m(m+4) = 0$$

$$m = 0 \quad m = -4$$

15. $0 = x^2 - 121$

$$0 = (x+11)(x-11)$$

$$x = \pm 11$$

16. $3k^2 + 2k = 2k^2 + 11k$

$$k^2 - 9k = 0$$

$$k(k-9) = 0$$

$$k = 0 \quad k = 9$$

17. $-w^2 - 3w - 7 = -2w^2 + 3$

$$w^2 - 3w - 10 = 0$$

$$(w+2)(w-5) = 0$$

$$w = 5 \quad w = -2$$

18. $2y^2 = 6y$

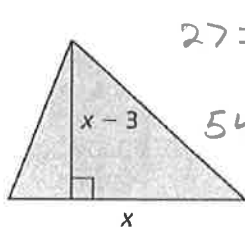
$$2y^2 - 6y = 0$$

$$2y(y-3) = 0$$

$$y = 0 \quad y = 3$$

In Exercises 19 and 20, find the value of x .

19. Area of triangle = 27



$$27 = \frac{x(x-3)}{2}$$

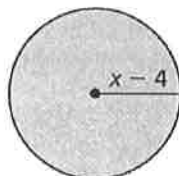
$$54 = x^2 - 3x$$

$$0 = x^2 - 3x - 54$$

$$0 = (x-9)(x+6)$$

$$x = 9 \quad x = -6$$

20. Area of circle = 9π



$$A = \pi r^2$$

$$9\pi = \pi(x-4)^2$$

$$9 = (x-4)^2$$

$$\pm 3 = x - 4$$

$$x = 7 \quad x = 1$$

In Exercises 21–24, solve the equation using any method. Explain your reasoning.

21. $\frac{c^2}{8} - 3 = 2$

$$\frac{c^2}{8} = 5$$

$$c^2 = 40$$

$$c = \pm 2\sqrt{10}$$

22. $7v = v^2$

$$0 = v^2 - 7v$$

$$0 = v(v-7)$$

$$v = 0 \quad v = 7$$

23. $-3(p+2)^2 = 12$

24. $x^2 - 5x - 24 = 0$

$$(x-8)(x+3) = 0$$

$$x = 8 \quad x = -3$$

25. Write a quadratic function in the form $f(x) = x^2 + bx + c$ that has zeros 2 and -12.

$$(x-2)(x+12)$$

$$f(x) = x^2 + 10x - 24$$

In Exercises 26-29, find the zero(s) of the function.

26. $h(x) = x^2 + 7x - 18$

$$0 = (x+9)(x-2)$$

$$x = -9 \quad x = 2$$

27. $j(x) = x^2 - 16$

$$0 = x^2 - 16$$

$$x = \pm 4$$

28. $g(x) = x^2 - 13x$

$$0 = x(x-13)$$

$$x = 0 \quad x = 13$$

29. $f(x) = 9x^2 - 24x + 16$

$$(3x-4)(3x-4)$$

$$x = 4/3$$

30. A local kayak rental shop rents 28 kayaks per week when it charges \$25 per day. For each \$5 increase in price, the shop loses four kayak rentals per week. How much should the kayak rental shop charge to maximize weekly revenue? What is the maximum weekly revenue?

\$300/rent
\$720

number of kayaks price

x = # of price increase

$$R(x) = (28 - 4x)(25 + 5x)$$

$$R(x) = 700 + 140x - 100x - 20x^2$$

$$R(x) = -20x^2 + 40x + 700$$

$$\frac{-40}{2(-20)} = 1$$

31. You drop a coin into a fountain from a height of 15 feet. Write an equation that models the height h (in feet) of the coin above the fountain t seconds after it has been dropped. How long is the coin in the air?

$$-20 + 40 + 700 = 720$$

$$h(t) = -16t^2 + 15$$

$$0 = -16t^2 + 15$$

$$t \approx 0.968 \text{ sec}$$

