Answers for 6.3

For use with pages 432–436

6.3 Skill Practice

1. composition

2. Sometimes. *Sample answer:* $3x^2 + 2x^2 = 5x^2$ is a power function, but $2x^3 + (-2x^3) = 0$ is not a power function.

3. $2x^{1/3} + 8x^{1/2}$, all positive real numbers

4. $2x^{1/3} + 8x^{1/2}$, all positive real numbers

5. $-6x^{1/3} + 8x^{1/2}$, all positive real numbers

6. $10x^{1/3} + 8x^{1/2}$, all positive real numbers

7. $-8x^{1/3}$, all real numbers

8. $8x^{1/3}$, all real numbers

9. 0, all real numbers

10. 0, all real numbers

11. B

12. $20x^{7/6}$, nonnegative real numbers

13. $20x^{7/6}$, nonnegative real numbers

14. $16x^{4/3}$, all real numbers

15. $25x$, all real numbers

16. $\frac{4}{5}x^{1/6}$, nonnegative real numbers

17. $\frac{5}{4x^{1/6}}$, positive real numbers

18. 1, all real numbers

19. 1, nonnegative real numbers

20. -25 **21.** -64 **22.** $-\frac{27}{5}$

23. $-\frac{36}{25}$ **24.** $-\frac{27}{5}$ **25.** 71

26. $-\frac{16}{25}$ **27.** -625

28. $\frac{3}{2x - 7}$, all real numbers except $x = 3.5$

29. $\frac{6}{x} - 7$, all real numbers except $x = 0$

30. $\frac{1}{x} + \frac{4}{3}$, all real numbers except $x = 0$

31. $\frac{2x - 13}{3}$, all real numbers

32. $\frac{2x - 3}{3}$, all real numbers

33. x, all real numbers

34. $\frac{x + 16}{9}$, all real numbers

35. $4x - 21$, all real numbers

36. $4x$ should have been substituted for x in the equation instead of multiplying by it; $= (4x)^2 - 3$, $= 16x^2 - 3$.

37. 4 should be distributed to each term, not just the first term; $= 4x^2 - 12$.

38. A

39. *Sample answer:* $f(x) = 3x$, $g(x) = 2x$

40. $f(x) = \sqrt[3]{x}$, $g(x) = x + 2$

41. $f(x) = x + 7$, $g(x) = 3x^2$

42. $f(x) = |x + 9|$, $g(x) = 2x$

6.3 Problem Solving

43. about 134 breaths per minute, about 48.3 breaths per minute, about 11.3 breaths per minute

44. $C(x(t)) = 3000t + 750$; 15,750, in 5 hours 250 sneakers were produced at a cost of $15,750.

45. a. $63

b. $61.50

c. Apply the 10% discount before the $15 discount; you pay $61.50 using this method and $63 using the other method.

46. a.

$$r(x) = \frac{20 - x}{6.4}; \; s(x) = \frac{\sqrt{144 + x^2}}{0.9}$$

b. $t(x) = \dfrac{20 - x}{6.4} + \dfrac{\sqrt{144 + x^2}}{0.9}$

c. 1.7; to minimize the time spent fetching the ball, Elvis should run for $20 - 1.7 = 18.3$ meters before he swims to the ball.

47. a. 1.5, about 1.4166667, about 1.4142157, about 1.4142136

b. 3 times; 4 times

6.3 Mixed Review

48. $y = 2x + 12$

49. $y = \frac{3}{2}x - 5$

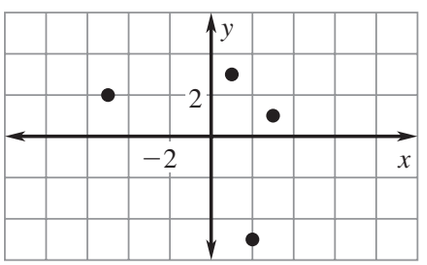
50. $y = -\frac{1}{3}x + 3$

51. $y = \frac{3}{4}x - \frac{7}{4}$

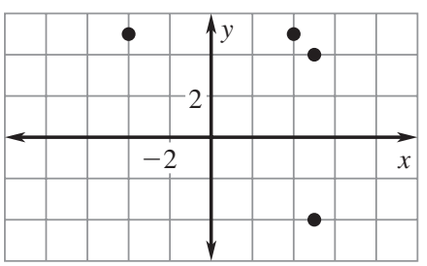
52. $y = x - 12$

53. $y = -\frac{a}{b}x + \frac{c}{d}$

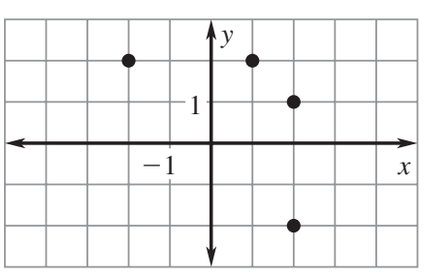
54.



55.



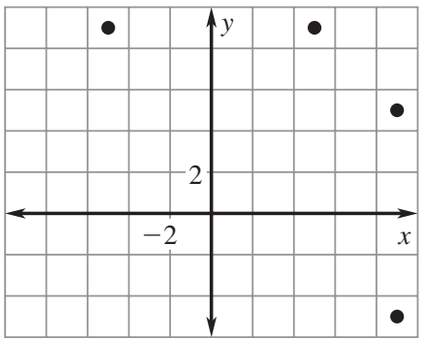
56.



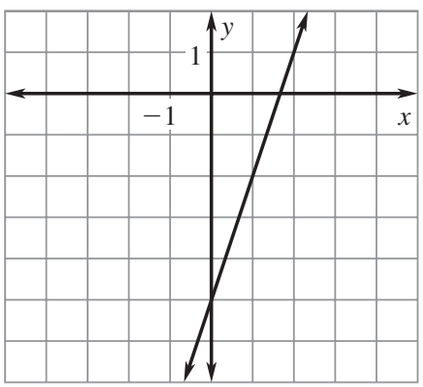
Answers for 6.3 *continued*

For use with pages 432–436

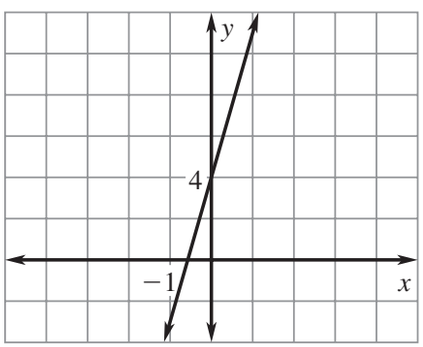
57.



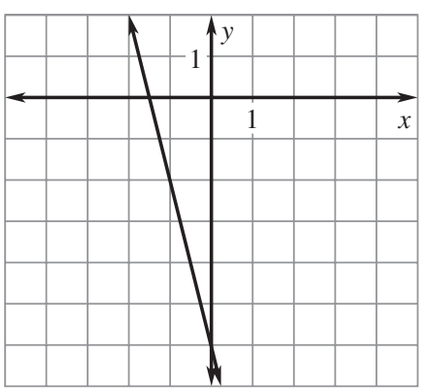
58.



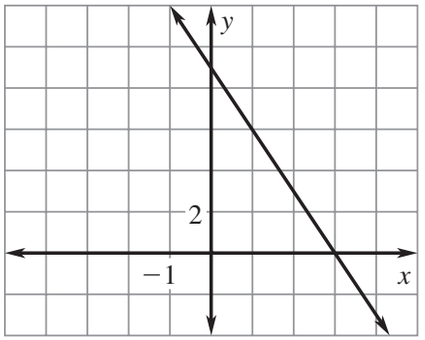
59.



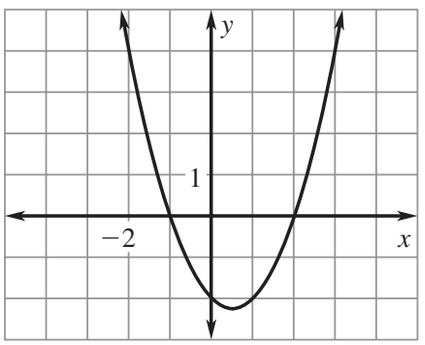
60.



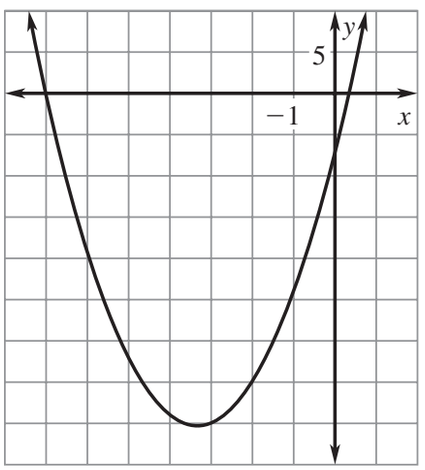
61.



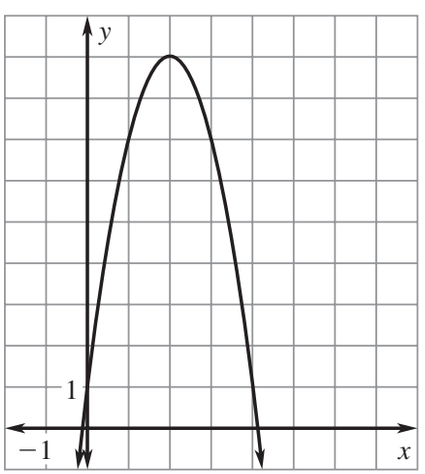
62.



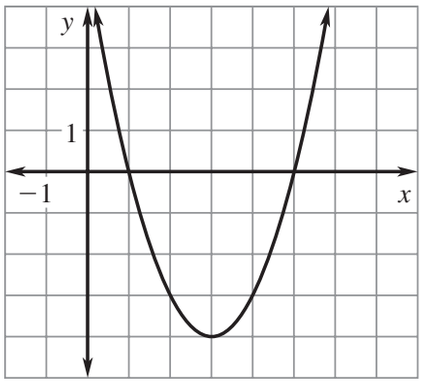
63.



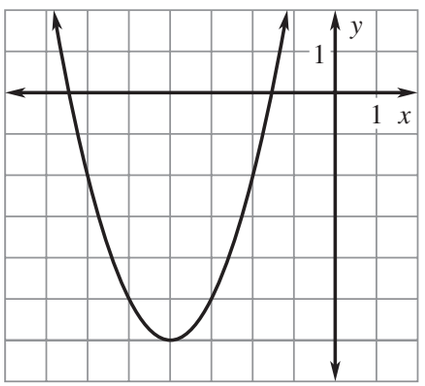
64.



65.



66.



6.1–6.3 Mixed Review of Problem Solving

1. a. $s(x) = x^2$

b. $c(x) = \pi\left(\frac{x}{2}\right)^2$

c. $r(x) = x^2 - \frac{\pi x^2}{4}$

2. a. $\frac{2}{3}S\sqrt{\pi S}$

b. about 830 in.^{3}

c. about 4176 in.^{3}

d. *Sample answer:* The 10-pin bowling ball has a surface area about 3 times the surface area of the candlepin bowling ball and a volume about 5 times that of the candlepin bowling ball.

3. $g(f(x))$; the bonus is on sales over \$100,000, so you must take 3% of the amount over 100,000, which is $x - 100{,}000$.

4. a. $15.7x^2$

b. $2252.8 = 15.7x^2$

c. about 12 ft

d. about 16.6 h

5. *Sample answer:* $f(x) = x^2$, $f(x) = \sqrt{x}$

6. *Sample answer:* The $\frac{1}{2}$ power means square root and since the numerator and denominator are both perfect squares, I would take the square root of each of them first to get $\frac{4}{2}$. This is equal to 2 and then I would take it to the 5th power to get 32; yes; since 16 and 4 are each to the same power, you can divide them to get 4 to the $\frac{1}{2}$ power, which is 2. Then take 2 to the 5th power to get 32.

7. 6.0 in.;