Answers for 8.2
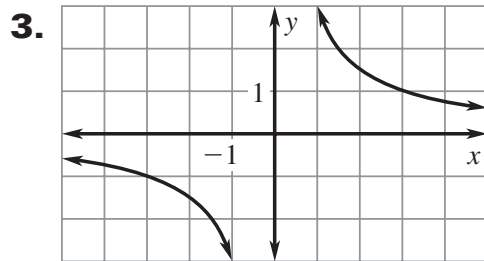
8.2 Skill Practice

1. range; domain

2. No; the denominator is an exponential function not a polynomial function.

3.

    The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$.

    Both graphs lie in the 1st and 3rd quadrants and have the same asymptotes, domain, and range.

4.

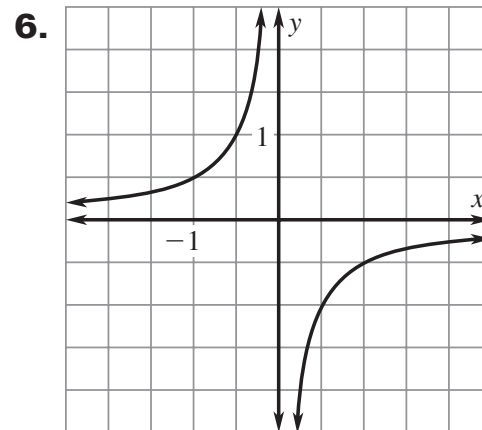   The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$.

    Both graphs lie in the 1st and 3rd quadrants and have the same asymptotes, domain, and range.
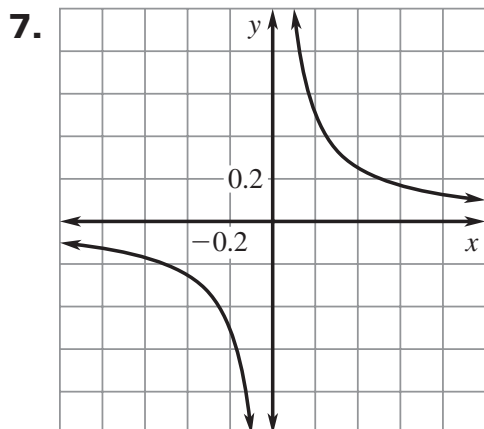
5.
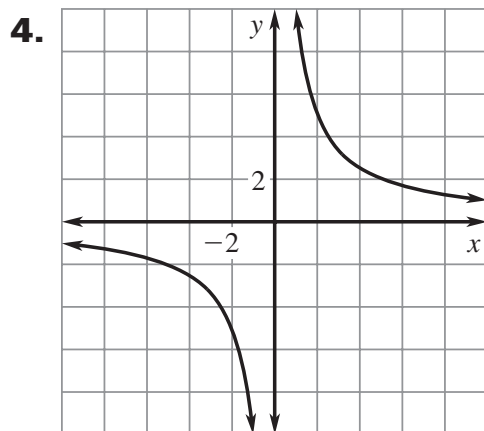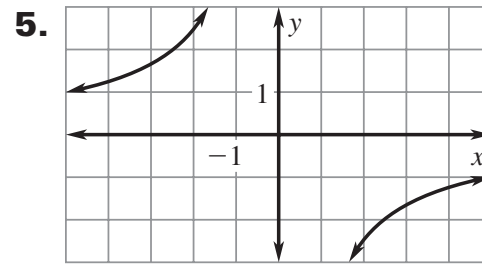
    The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$ and is located in quadrants 2 and 4. Both graphs have the same asymptotes, domain, and range.
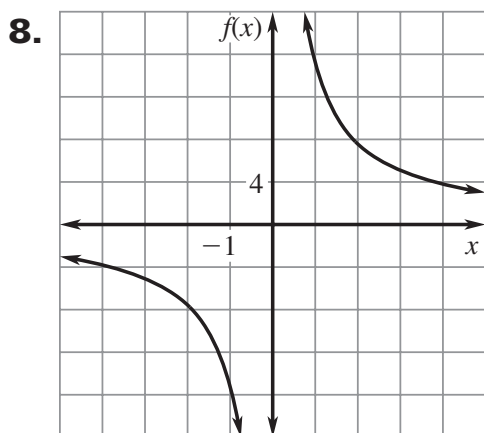
6.

    The graph lies closer to the axes than the graph of $y = \dfrac{1}{x}$.

    Both graphs lie in the 1st and 3rd quadrants and have the same asymptotes, domain, and range.

7.

The graph lies closer to the axes than the graph of $y = \dfrac{1}{x}$. Both graphs lie in the 1st and 3rd quadrants and have the same asymptotes, domain, and range.
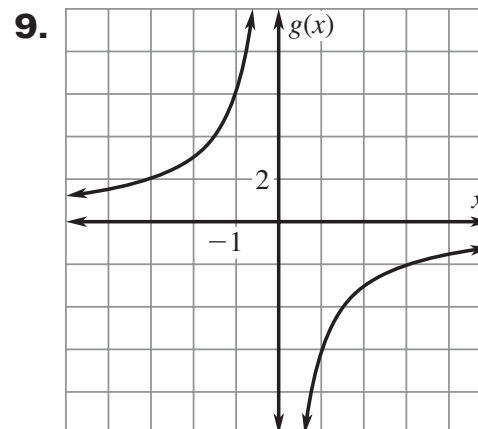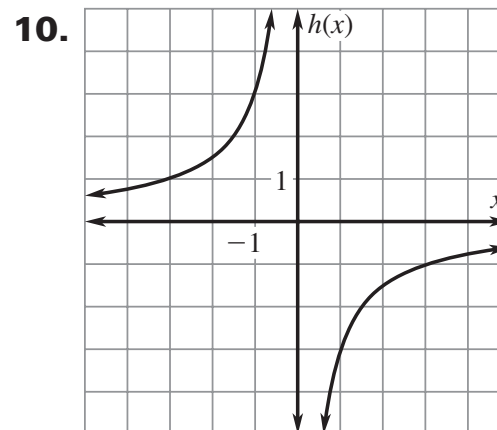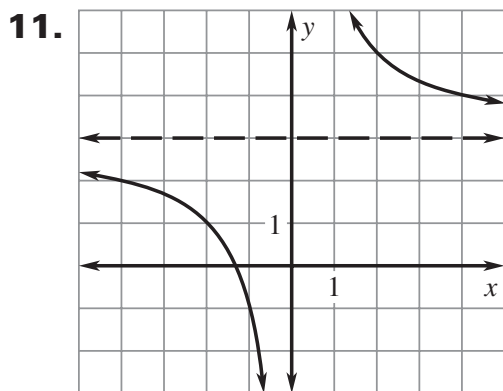
8.

The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$ and is located in quadrants 2 and 4. Both have the same asymptotes, domain, and range.

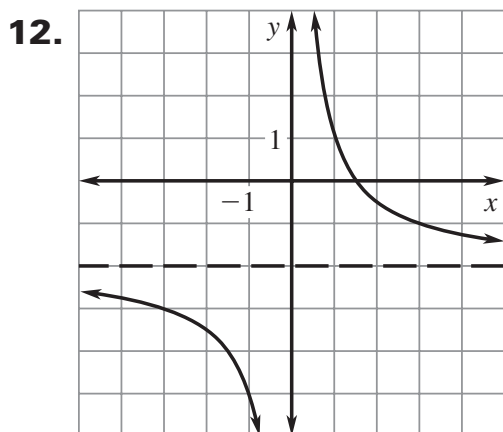**9.**

The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$ and is located in quadrants 2 and 4. Both have the same asymptotes, domain, and range.
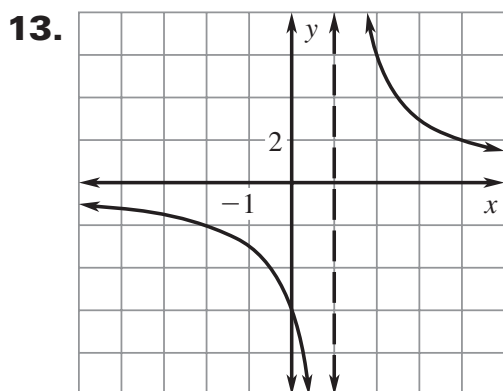
10.

The graph lies farther from the axes than the graph of $y = \dfrac{1}{x}$ and is located in quadrants 2 and 4. Both have the same asymptotes, domain, and range.
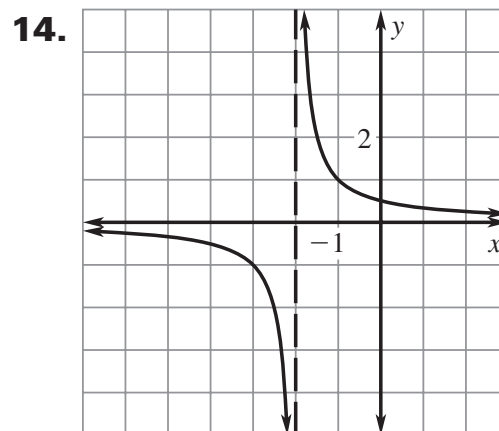
11.

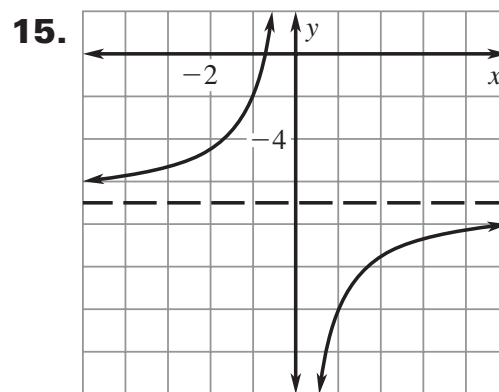domain: all real numbers except 0, range: all real numbers except 3

12.

domain: all real numbers except 0, range: all real numbers except −2

13.

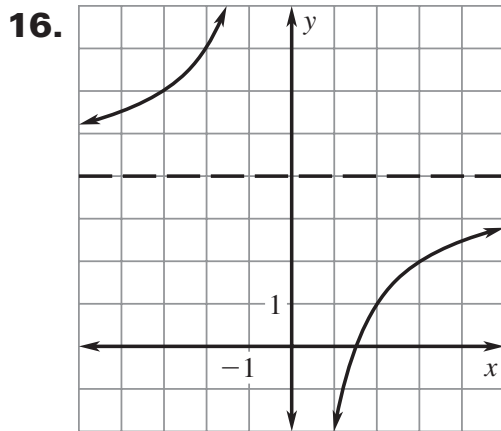domain: all real numbers except 1, range: all real numbers except 0

14.

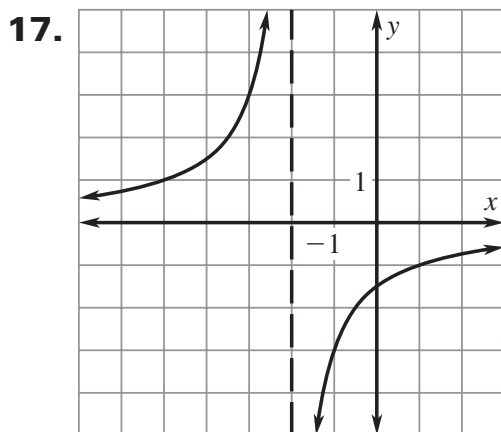domain: all real numbers except −2, range: all real numbers except 0

15.

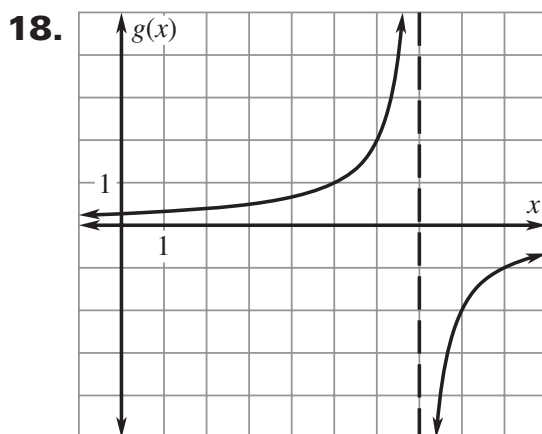domain: all real numbers except 0, range: all real numbers except −7
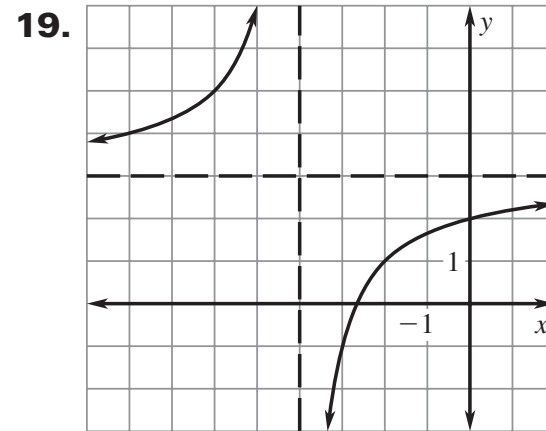
Answers for 8.2 *continued*

16.

domain: all real numbers
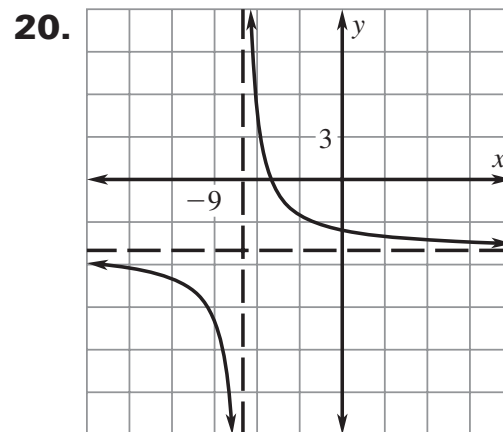except 0, range: all real numbers
except 4

17.

domain: all real numbers
except −2, range: all real
numbers except 0

18.

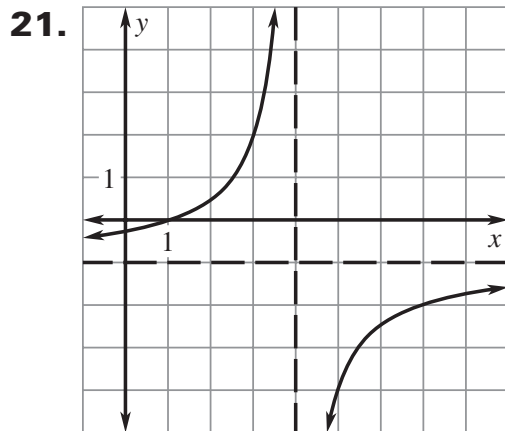domain: all real numbers
except 7, range: all real numbers
except 0

19.

domain: all real numbers
except −4, range: all real
numbers except 3
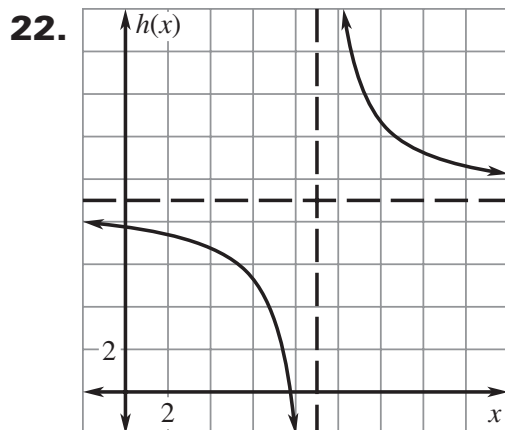
20.

domain: all real numbers
except −7, range: all real
numbers except −5

Answers for 8.2 *continued*

21.

domain: all real numbers except 4, range: all real numbers except -1
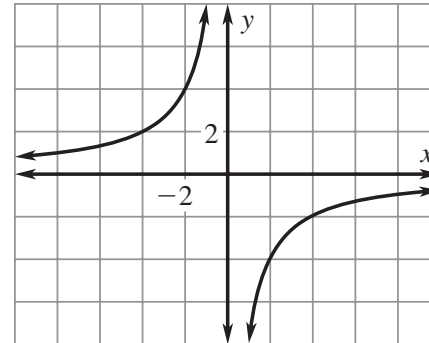
22.

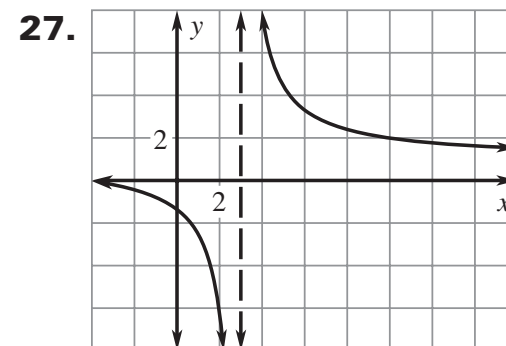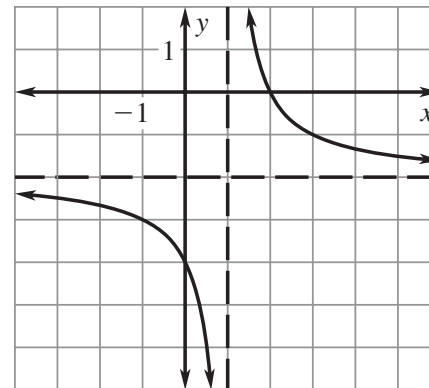domain: all real numbers except 9, range: all real numbers except 9

23. D

24. a. The graph will lie farther from the asymptotes and will be a reflection in either asymptote.

b. The vertical asymptote is shifted left 4 units.

c. The horizontal asymptote is shifted up 4 units.

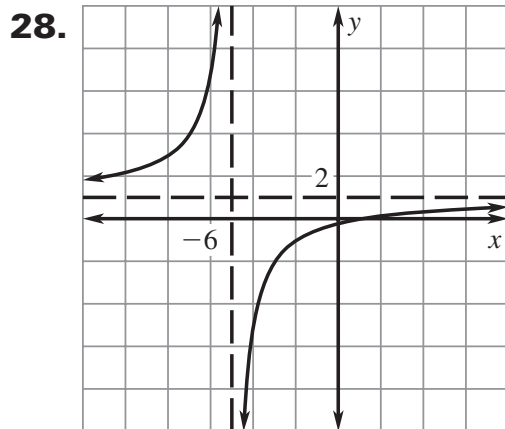**25.** The graph should be $y = \dfrac{-8}{x}$, not $y = \dfrac{8}{x}$.

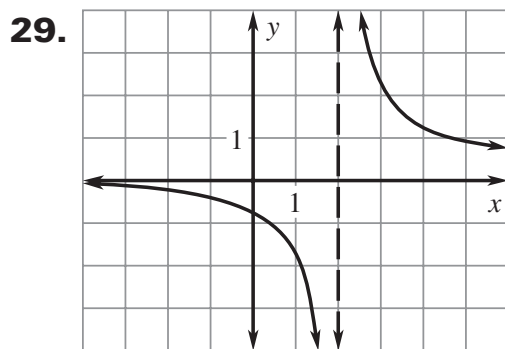**26.** The vertical asymptote should be $x = 1$, not $x = -1$.

27.

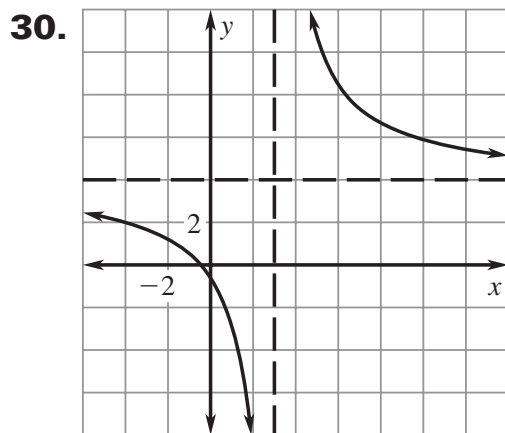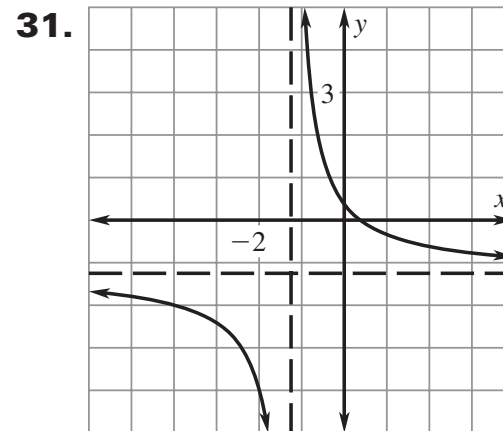domain: all real numbers except 3, range: all real numbers except 1

28.

domain: all real numbers except -5, range: all real numbers except 1
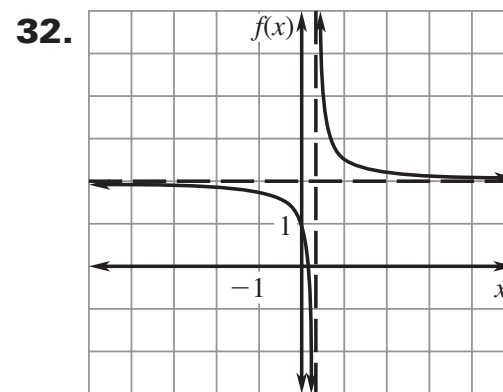
29.

domain: all real numbers except 2, range: all real numbers except $\frac{1}{4}$

30.

domain: all real numbers except 3, range: all real numbers except 4
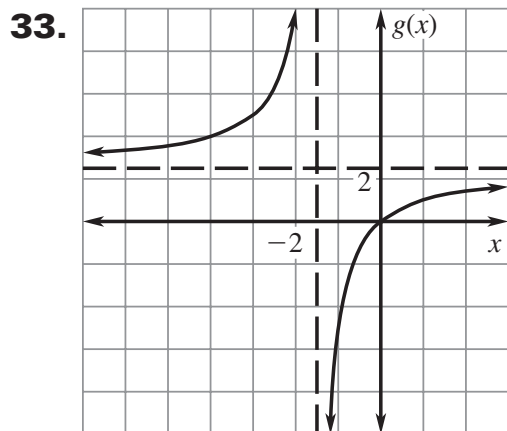
31.

domain: all real numbers except $-\frac{5}{4}$, range: all real numbers except $-\frac{5}{4}$
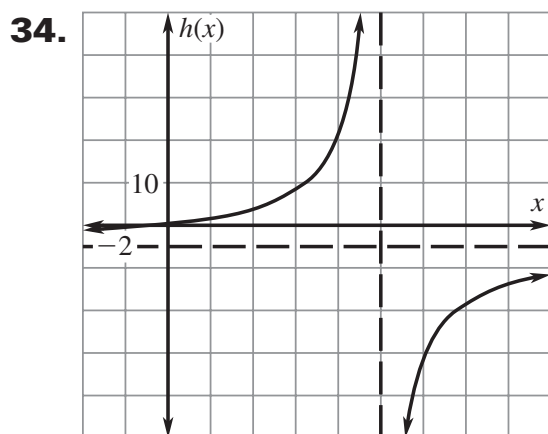
32.

domain: all real numbers except $\frac{1}{3}$, range: all real numbers except 2

33.

domain: all real numbers

except $-\dfrac{3}{2}$, range: all real

numbers except $\dfrac{5}{2}$

34.

domain: all real numbers
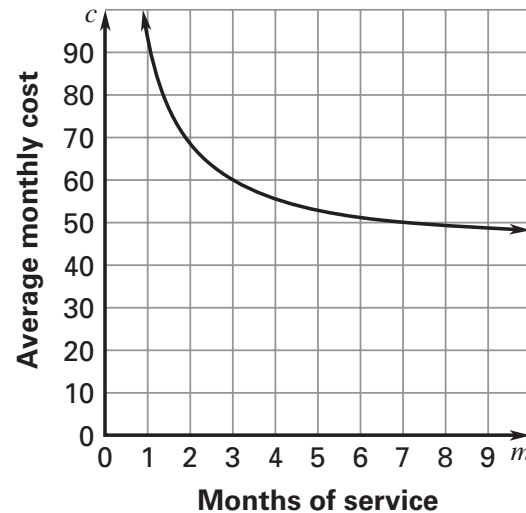
except 10, range: all real numbers
except -5

35. *Sample answer:* $y = \dfrac{3x + 1}{x + 8}$

36. $f(x) = \dfrac{a}{x - h} + \dfrac{k(x - h)}{(x - h)}$
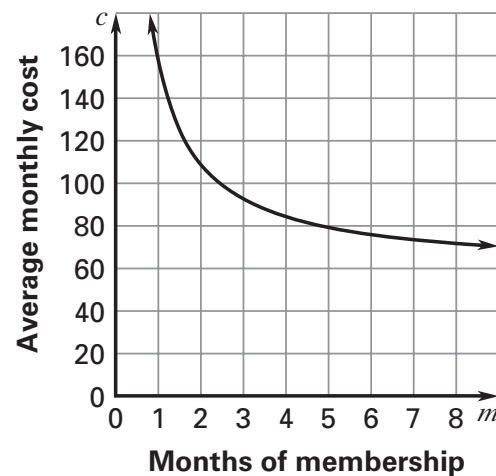
$= \dfrac{a + kx - kh}{x - h}$

8.2 Problem Solving

37. $c = \dfrac{43m + 50}{m}$

Months of service

5 months

38. $c = \dfrac{59m + 100}{m}$

Months of membership

10 months
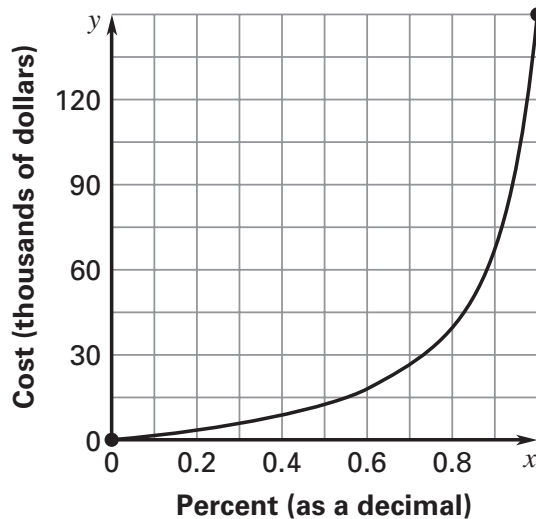
39. a. About 14.5 sec. *Sample answer:* Substitute 25 for T to find $t \approx 2.89$. Since you are 5 kilometers away, multiply t by 5 to get $5(2.89) \approx 14.5$ seconds.
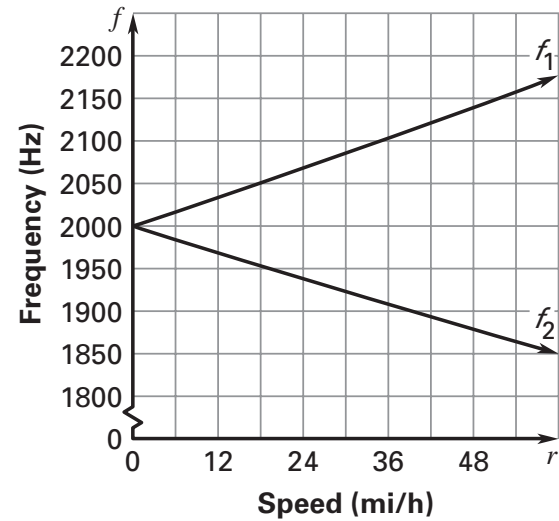
b.
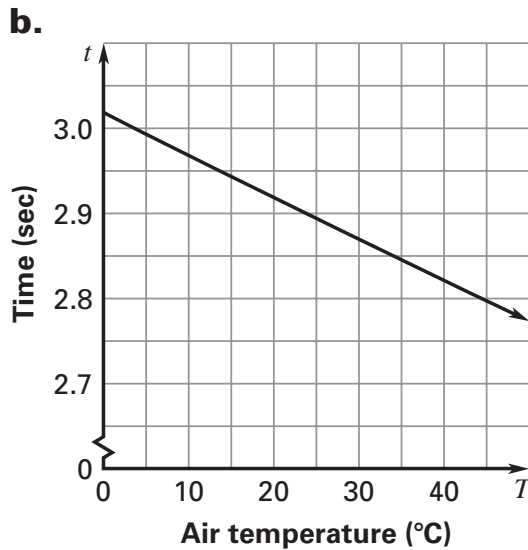
about 3.89°C

40. a.

domain: $0 \le x \le 100$,
range: $0 \le y \le 150{,}000$

b. $3333.33; $8571.43; $40,000; no. *Sample answer:* The values are not increasing at a constant rate.

41. a. approaching: $f_\ell = \dfrac{1{,}480{,}000}{740 - r}$,
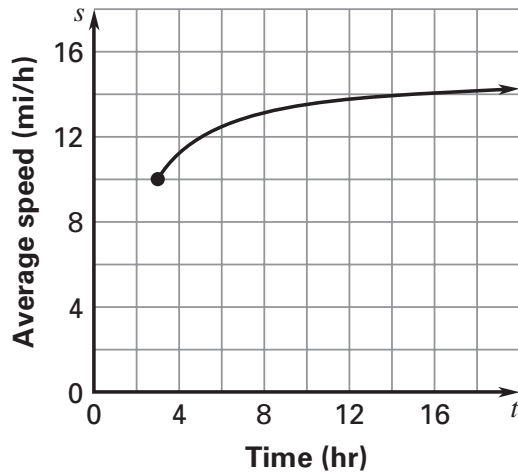
moving away: $f_\ell = \dfrac{1{,}480{,}000}{740 + r}$

b.

c. The frequency of a sound that is approaching is greater than that of a sound that is moving away.

Answers for 8.2 *continued*

42. $s = \dfrac{30 + 15(t - 3)}{t}$
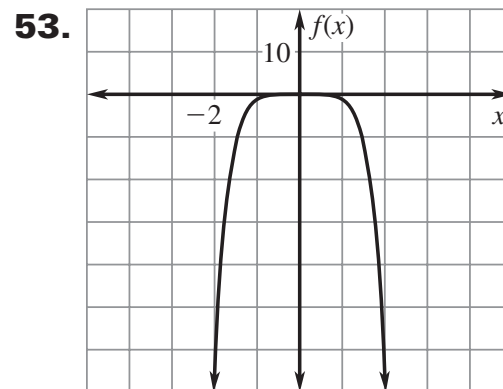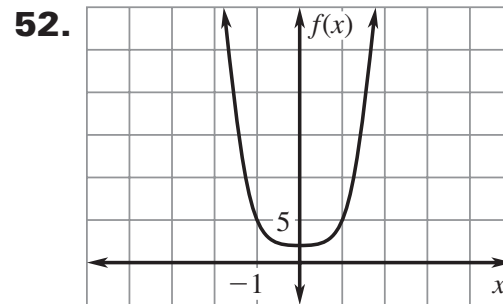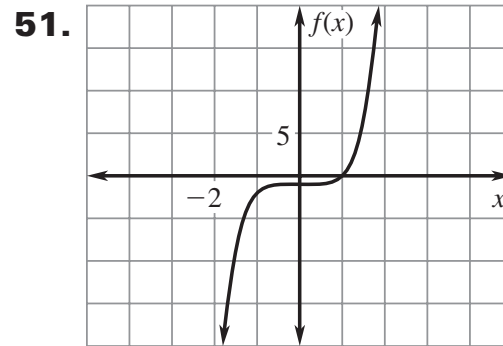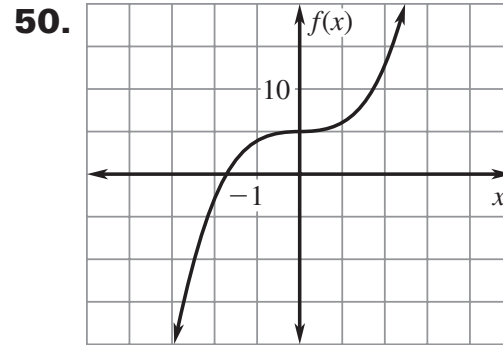

8.2 Mixed Review

43. $(m + 13)(m + 5)$

44. $(p + 8)(p + 7)$

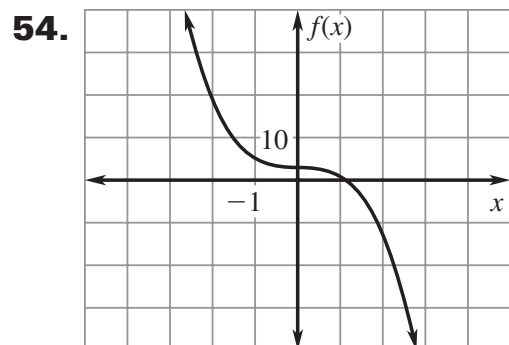**45.** $(q - 7)(q + 7)$

46. $(r - 10)^2$

47. $(x - 7)(x + 3)$

48. $(z - 4)(z - 5)$

49.

50.

51.

52.

53.

54.

55. e^{-4}

56. $3e^x + 6$

57. $e^{4x + 2}$