1) Domain: $(-\infty, 1) \cup (1, \infty)$; range: $(-\infty, 3) \cup (3, \infty)$

2) Domain: $(-\infty, 2) \cup (2, \infty)$; range: $(-\infty, 1)$

3) Vertical: $x = 1$; horizontal: $y = 3$

4) Even; symmetry with respect to the y–axis

5) Shrink the graph of $y = \dfrac{1}{x}$ by a factor of $\dfrac{7}{10}$ and reflect it across the x–axis or the y–axis, and shift downward 7 units.

6) Shift the graph of $y = \dfrac{1}{x^2}$ to the right 8 units and upward 9 units.

7) Stretch the graph of $y = \dfrac{1}{x^2}$ vertically by a factor of 7, reflect across the x–axis, and shift to the left 8 units.

8) Stretch the graph of $y = \dfrac{1}{x^2}$ vertically by a factor of 7, reflect across the x–axis, and shift to the left 12 units.

9)

10)

11) $f(x) = -2 + \dfrac{1}{x + 2}$

12) $f(x) = 3 + \dfrac{1}{x - 2}$

12
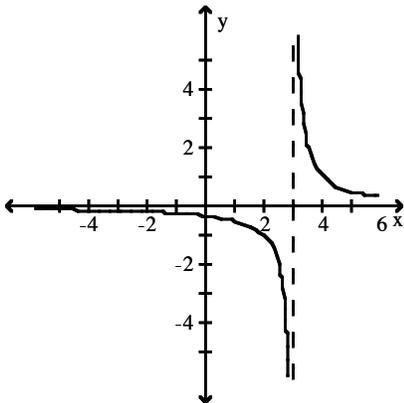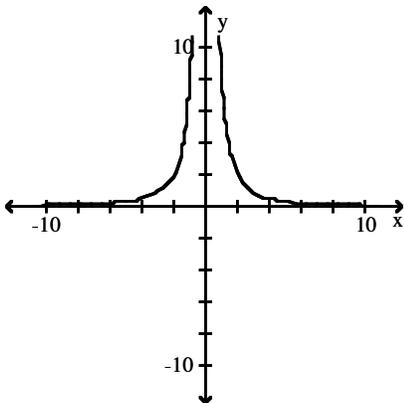
13)
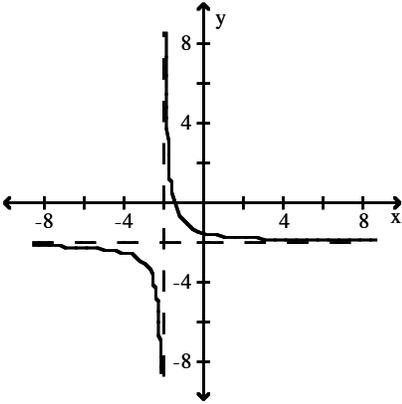
14)
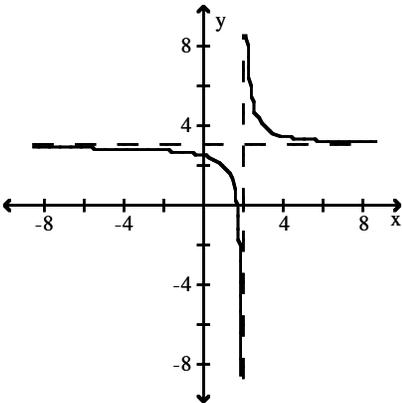
15) None
16) None
17) None
18)
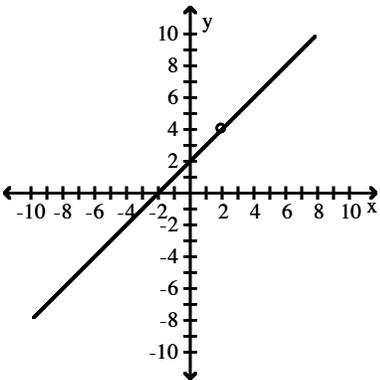
19)
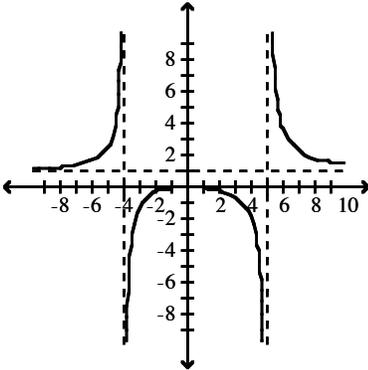
20)
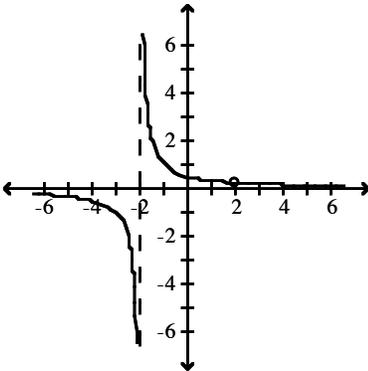
21) vertical asymptote: $x = 5$;
   horizontal asymptote: $y = 1$

22) B
23) C
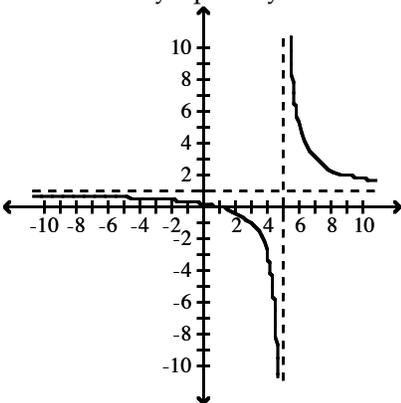
24) $y = x + 1$
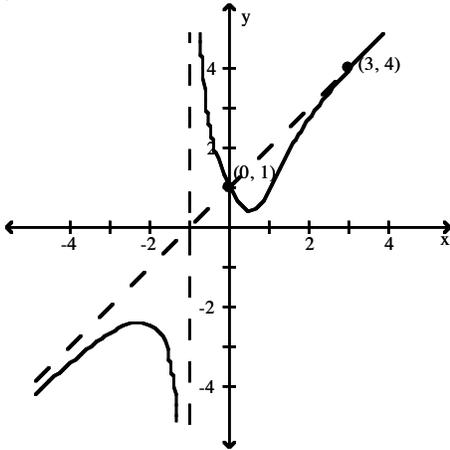
25) $\varnothing$

26) $\left\{-\dfrac{43}{8}\right\}$

27) $\left(-4, \dfrac{7}{2}\right]$

28) $[-4, -2) \cup [1, 2)$

29) $\left(-\dfrac{3}{7}, \infty\right)$

30) $(-\infty, \infty)$

31) $\{12\}$

32) $\left\{\dfrac{17 \pm \sqrt{33}}{2}\right\}$

33) $\{-1, -1\}$

34) $[0, 18]$

35) 4

36) 48

37) 24 in.

38) 1000

39) 100

40) $\dfrac{1}{z^{4/3}}$

41) $(y + 1)^{5/14}$

42) $\left(-\infty, \dfrac{7}{10}\right]$

43) $(-\infty, \infty)$

44) $\{2\}$

45) $\{-2\}$

46) Rewrite as $6\sqrt{x + 4}$. Shift the graph of $y = \sqrt{x}$ to the left 4 units and stretch vertically by a factor of 6.

47) Rewrite as $5\sqrt[3]{x + 2}$. Shift the graph of $y = \sqrt[3]{x}$ to the left 2 units and stretch vertically by a factor of 5.

48) The graph is a circle.

49) The graph is a horizontal parabola.

50) $[6, \infty)$

51)
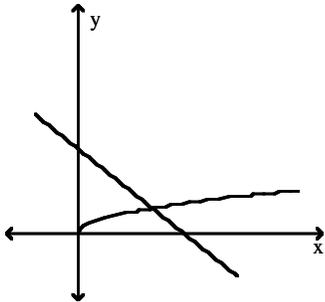
One real solution; $\left\{\dfrac{17 - \sqrt{33}}{2}\right\}$; $\dfrac{17 + \sqrt{33}}{2}$ is extraneous.

52)
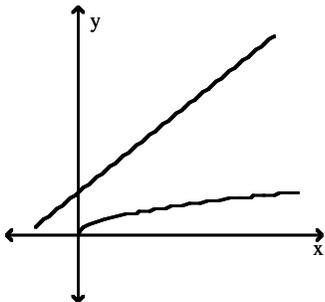
No real solutions; $\varnothing$; no extraneous values

53) {3}

54) {3, −1}

55) {−2}

56) $\left\{\dfrac{15}{4}\right\}$

57) {3, −1}

58) {4, 25}

59) $\left\{-\dfrac{5}{3}, 1\right\}$

60) $\left\{-\dfrac{1}{2}\right\}$

61) 5.1 miles from home

62) 58.3 miles