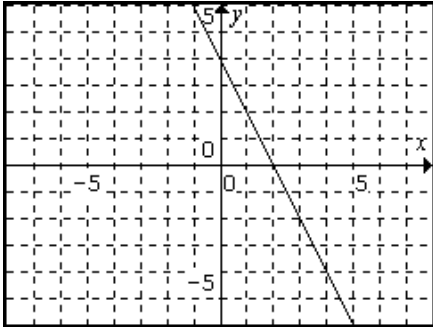
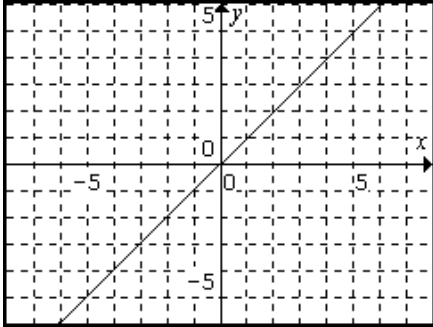


Section 9.1

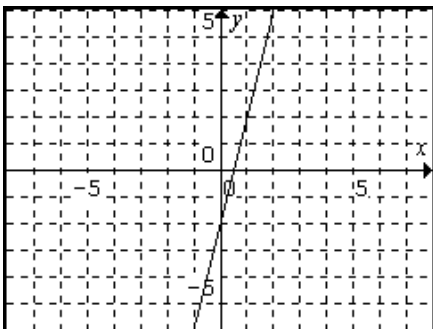
1. x-intercept = $(2,0)$, y-intercept = $(0,4)$



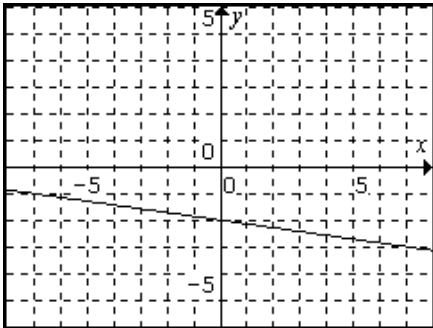
3. x-intercept = $(0,0)$, y-intercept = $(0,0)$



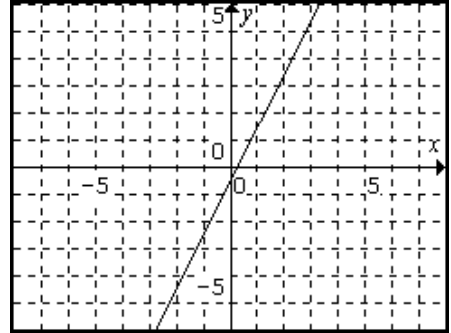
5. x-intercept = $(\frac{1}{2}, 0)$, y-intercept = $(0, -2)$



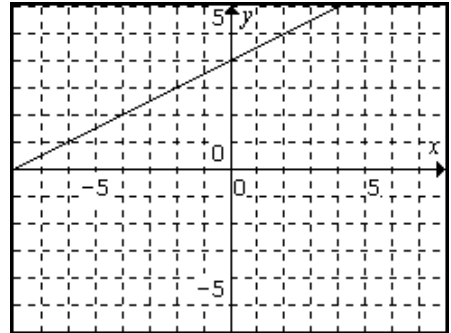
7. x-intercept = $(-14, 0)$, y-intercept = $(0, -2)$



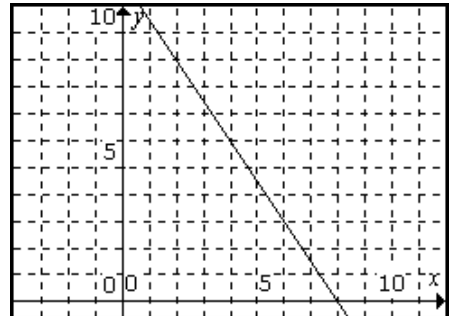
9. x-intercept = $(\frac{1}{4}, 0)$, y-intercept = $(0, -\frac{1}{2})$



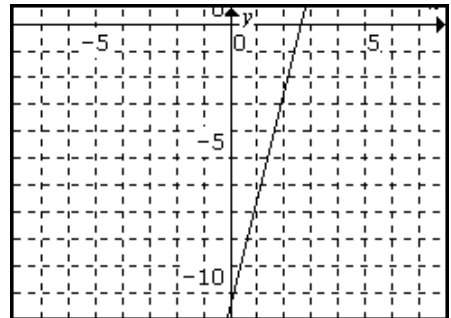
11. x-intercept = $(-8, 0)$, y-intercept = $(0, 4)$



13. x-intercept = $(8, 0)$, y-intercept = $(0, 12)$



15. x-intercept = $(\frac{21}{8}, 0)$, y-intercept = $(0, -\frac{21}{2})$



17. $m = 2$

19. $m = 1$

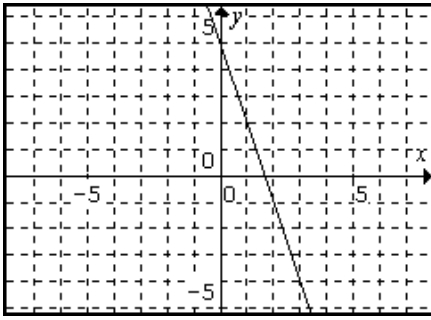
21. $m = -\frac{1}{5}$

23. $m = \text{undefined}$

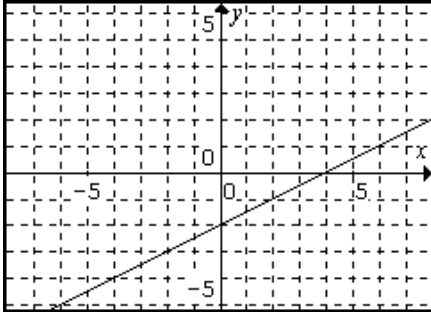
25. $m = \frac{1}{4}$

27. $m = \frac{49}{78}$

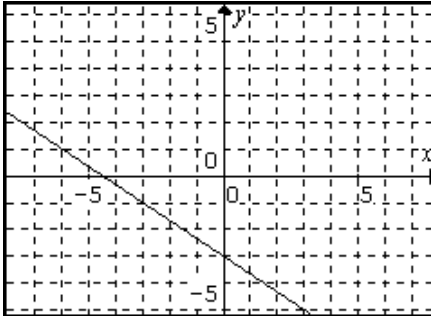
29. $m = -3$



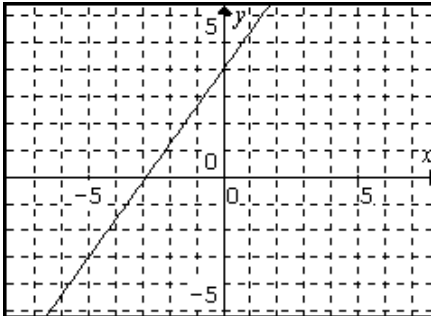
31. $m = \frac{1}{2}$



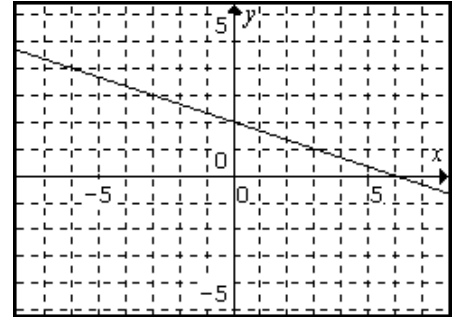
33. $m = -\frac{2}{3}$



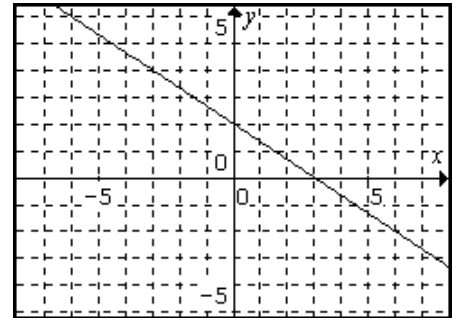
35. $m = \frac{7}{5}$



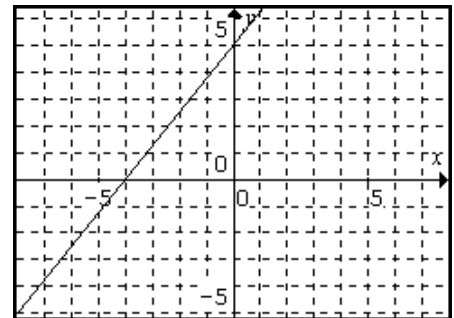
37. $m = -\frac{1}{3}$



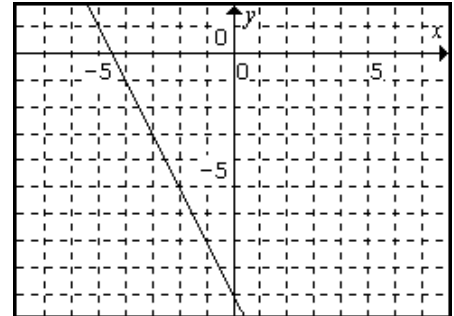
39. $m = -\frac{2}{3}$



41. $m = \frac{5}{4}$



43. $m = -2$



45. $y = -2x + 5$

47. $y = \frac{2}{3}x - \frac{7}{3}$

49. $y = -\frac{3}{5}x - \frac{16}{5}$

51. $y = 7x - 23$

53. $y = -\frac{19}{9}x + \frac{13}{9}$

55. $y = -\frac{2}{3}x - \frac{1}{3}$

57. $5x - y = 22$

59. $x + 3y = -29$

61. $x + 3y = -21$

63. $6x + 7y = 9$

65. $9x - 2y = -78$

67. $2x + 3y = -1$

69. $y = \frac{1}{4}x - 1, x - 4y = 4$

71. $y = -\frac{1}{2}x + \frac{3}{2}, x + 2y = 3$

73. $y = -\frac{1}{3}x + 2, x + 3y = 6$

75. $y = -3x, 3x + y = 0$

77. $y = -\frac{5}{2}x + 10, 5x + 2y = 20$

Section 9.2

- | | | | | |
|----|--|--|---|---|
| 1. | a. Function
$D: \{2,0,6,3,4\}$
$R: \{1,0,5,2,-1\}$ | b. Not a Function
$D: \{1,2,-3\}$
$R: \{1,0,7\}$ | c. Function
$D: \{a, e, i, o, u\}$
$R: \{A, E, I, O, U\}$ | d. Function
$D: \{x_1, x_2, x_3, x_4\}$
$R: \{y_1, y_2\}$ |
|----|--|--|---|---|

3. a. Yes b. Yes c. No d. Yes

5. Yes 7. Yes 9. Yes 11. Yes 13. Yes

15. a. -1 b. 2 c. -4 d. -7 17. a. 0 b. 10 c. 0 d. 1

19. a. 3 b. 3 c. 5 d. $|2a - 3|$ 21. a. -1 b. $\frac{1}{2}$ c. 1 d. $\frac{2t-1}{t+1}$

23. a. 1 b. 2 c. $\sqrt{4n+1}$ d. $\sqrt{4a+4b+1}$ 25. a. 1 b. -3 c. $2t - |t|$ d. $2t - 4 - |t - 2|$

27. a. 0 b. $\sqrt{2(\text{apple})} - 1$ c. $\sqrt{2a+1}$ 29. a. 5 b. $2 - 3u$ c. $-3x - 1$ d. -3

31. a. $3t^2 - t$ b. $3t^2 + 5t + 2$ c. $3t^4 + 12t^3 + 11t^2 - 2t$ d. $6x + 3k - 1$

33. a. $2x^2 + 3x + 1$ b. $8x^2 - 14x + 6$ c. $2x + 5 - 3\sqrt{x+2}$ d. $4x + 2h - 3$

35. a. $a\Delta^2 + b\Delta + c$

b. $a\Delta^2 + 2a\Delta + a + b\Delta + b + c$

c. $4a\Delta^2 + 4a\Delta\Theta + a\Theta^2 + 2b\Delta + b\Theta + c$

d. $2ax + ah + b$

37. a. x^2 b. $\frac{1}{n^2 - 2nm + m^2}$ c. $\frac{1}{t^4 - 2t^3 + t^2}$ d. $\frac{-2x - h}{x^2(x+h)^2}$

39. a. $\frac{x^2}{x^2 + 1}$ b. $\frac{n-1}{n}$ c. x d. $\frac{1}{(x+h+1)(x+1)}$

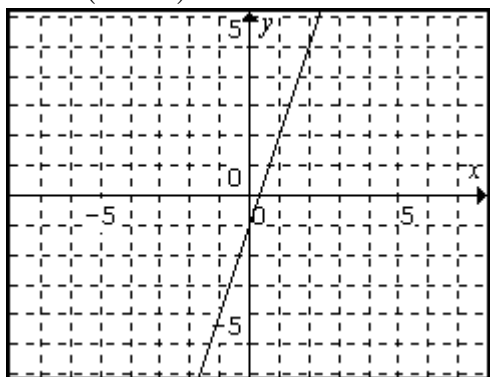
41. a. x b. $(x+k)^3 = x^3 + 3xk^2 + 3x^2k + k^3$ c. $3x^2 + 3xk + k^2$

43. a. 0 b. $x^3 + 3x^2h + 3xh^2 + h^3 - 2x^2 - 4xh - 2h^2 - 2x - 2h + 1$ c. $3x^2 + 3xh + h^2 - 4x - 2h - 2$

Section 9.3

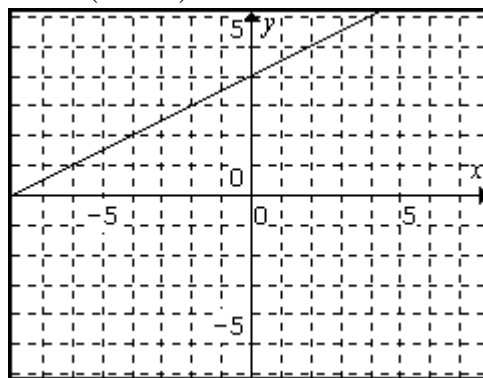
1. $D: (-\infty, \infty)$

$R: (-\infty, \infty)$



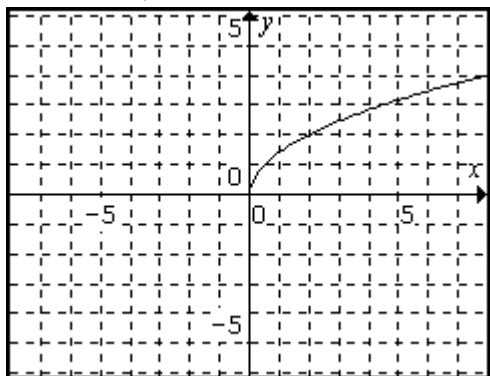
3. $D: (-\infty, \infty)$

$R: (-\infty, \infty)$



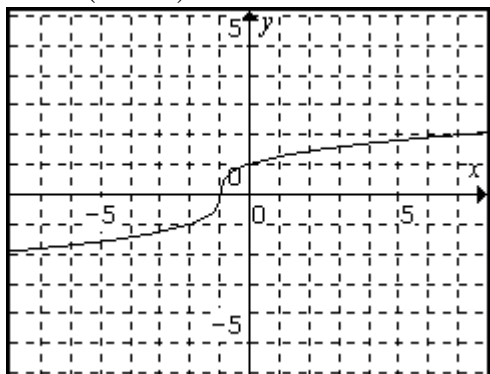
5. $D: [0, \infty)$

$R: [0, \infty)$



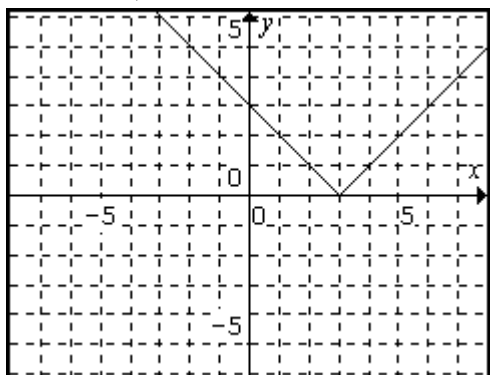
7. $D: (-\infty, \infty)$

$R: (-\infty, \infty)$



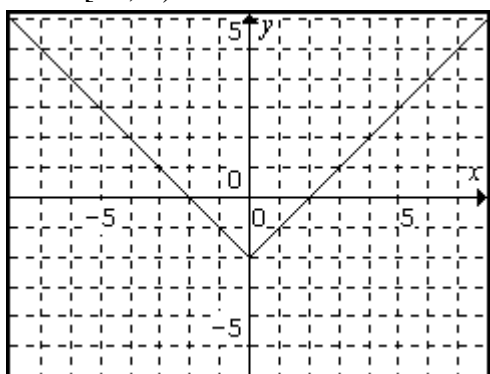
9. $D: (-\infty, \infty)$

$R: [0, \infty)$



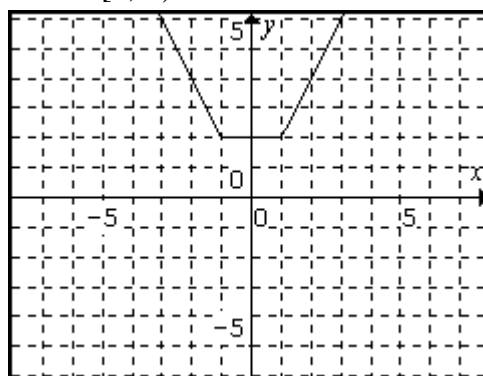
11. $D: (-\infty, \infty)$

$R: [-2, \infty)$



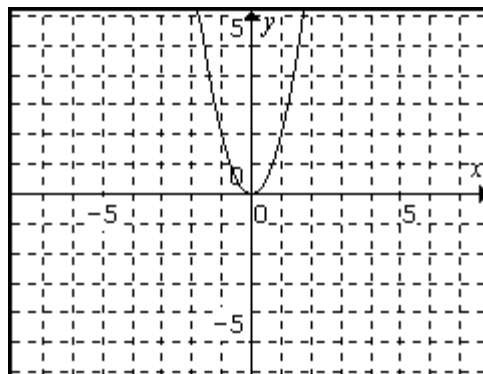
13. $D: (-\infty, \infty)$

$R: [2, \infty)$



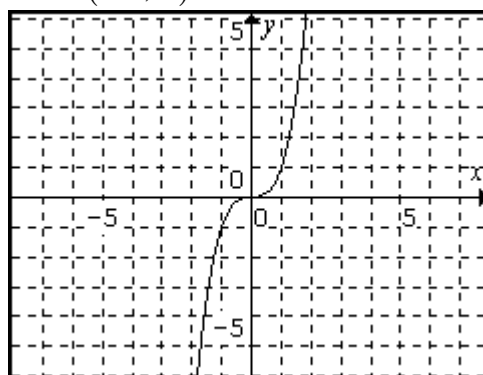
15. $D: (-\infty, \infty)$

$R: [0, \infty)$



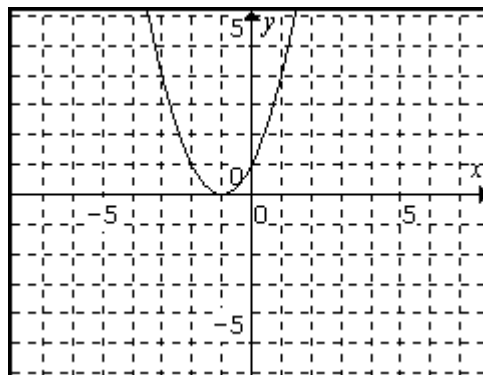
17. $D: (-\infty, \infty)$

$R: (-\infty, \infty)$



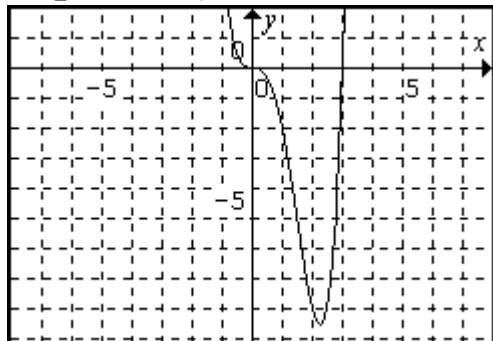
19. $D: (-\infty, \infty)$

$R: [0, \infty)$



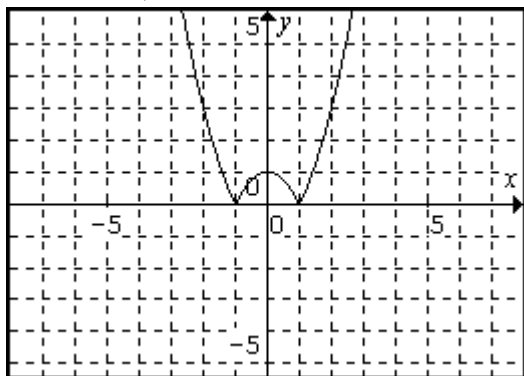
21. $D: (-\infty, \infty)$

$R: \left[-\frac{2187}{256}, \infty\right)$



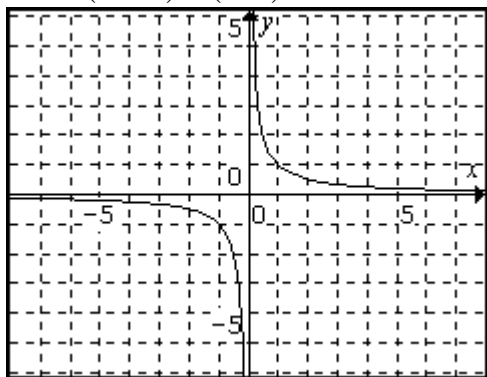
23. $D: (-\infty, \infty)$

$R: [0, \infty)$



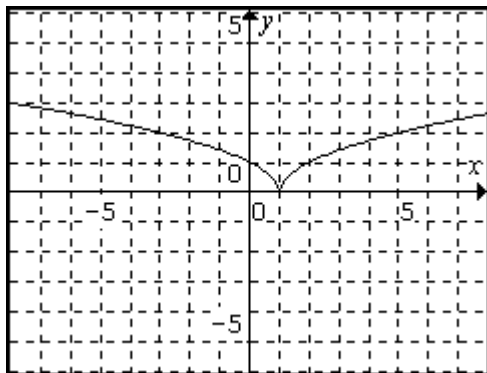
25. $D: (-\infty, 0) \cup (0, \infty)$

$R: (-\infty, 0) \cup (0, \infty)$



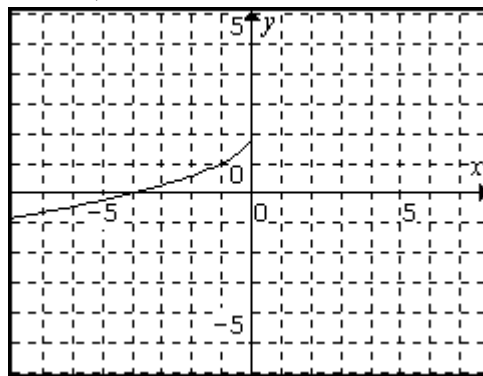
27. $D: (-\infty, \infty)$

$R: [0, \infty)$

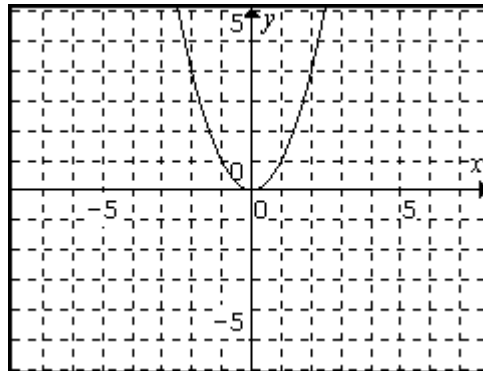


29. $D: (-\infty, 0]$

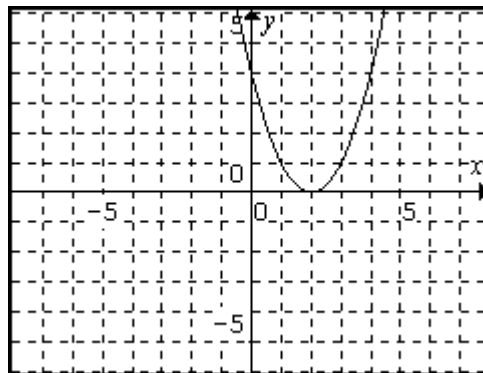
$R: (-\infty, 2]$



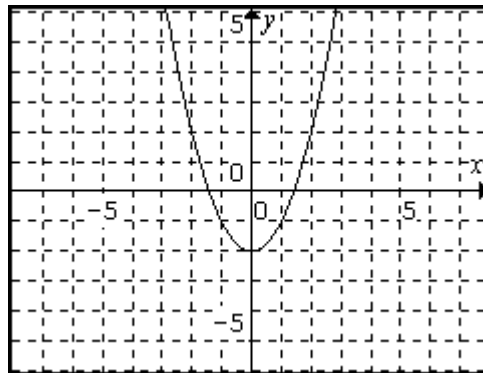
31. a.



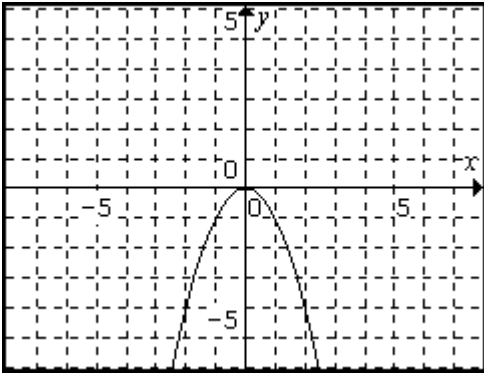
b.



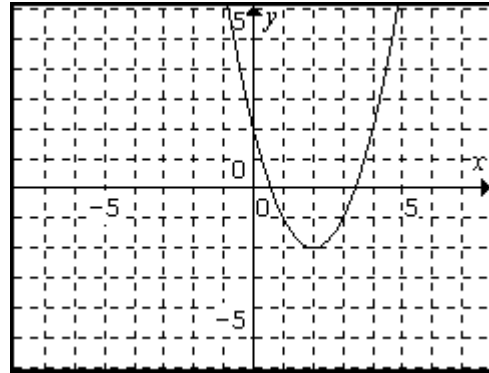
c.



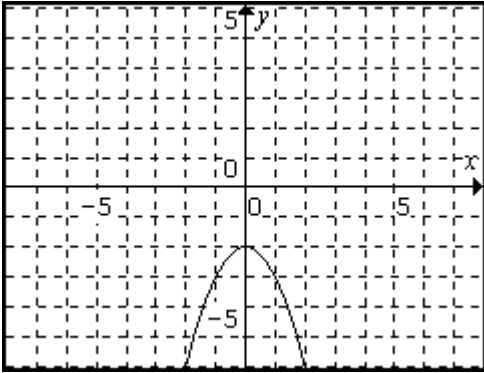
d.



f.



e.



33. yes

35. yes

37. No

39. No

41. $D: \left[\frac{1}{2}, \infty\right)$

43. $D: (-\infty, \infty)$

45. $D: (-\infty, \infty)$

47. $D: (-\infty, -2) \cup (-2, 0) \cup (0, \infty)$

49. $D: [-4, \infty)$

51. $D: (-\infty, 2]$

53. $D: \left(-\infty, \frac{5}{2}\right]$

55. $D: (-\infty, 4) \cup (4, \infty)$

57. $D: (-\infty, -2) \cup (-2, 2) \cup (2, \infty)$

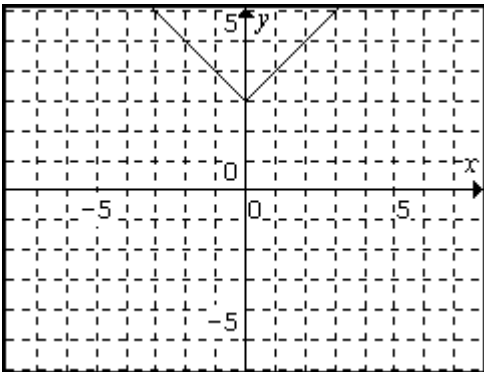
59. $D: (-\infty, 0]$

61. $D: \left[-\frac{1}{2}, 1\right) \cup (1, \infty)$

63. $D: (-1, \infty)$

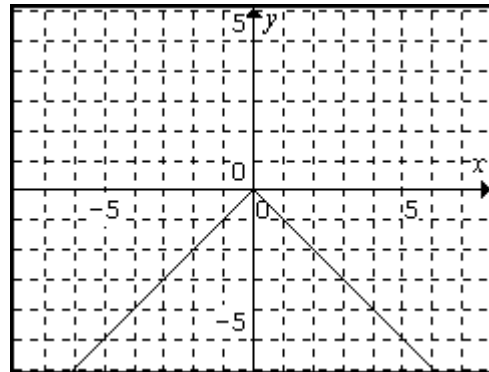
Section 9.4

1.



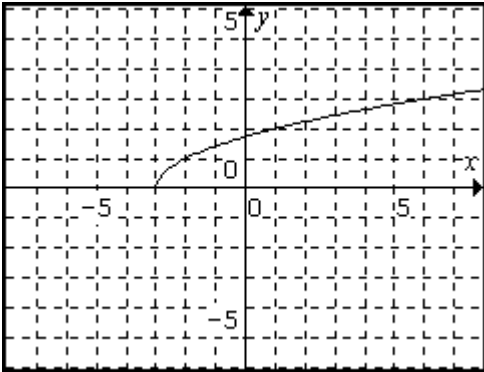
shift up 3 units

3.



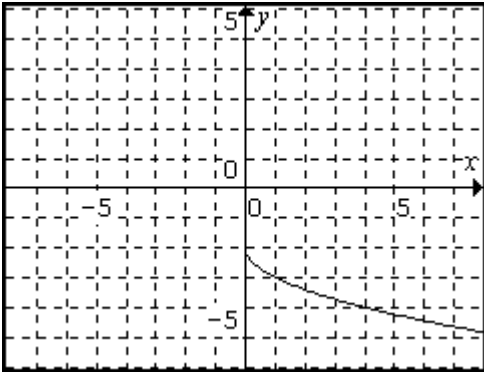
reflection about x-axis

5.



Shift left 3 units

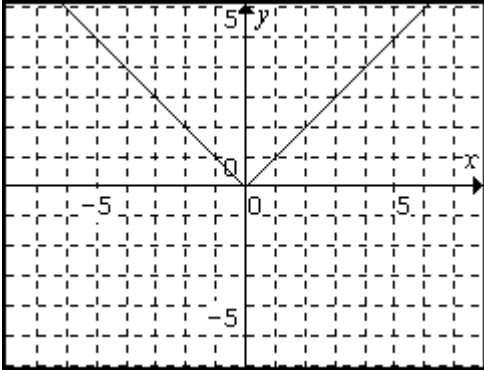
7.



Reflection about x-axis

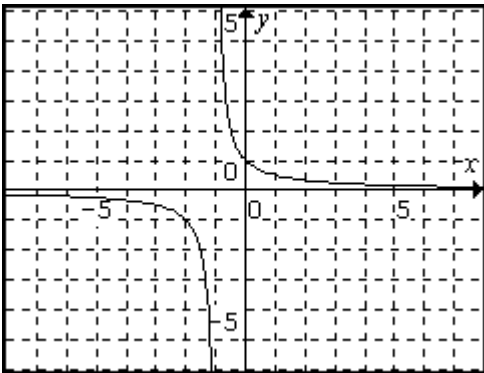
Shift down 2 units

9.



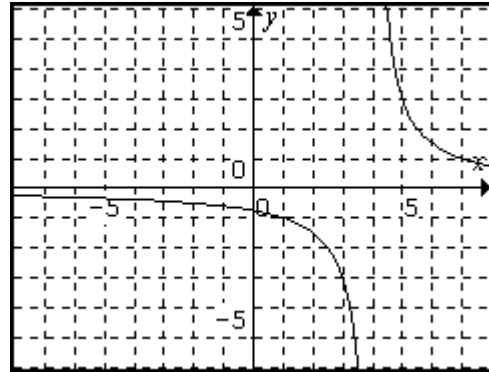
reflection about y-axis (no effect on graph)

11.



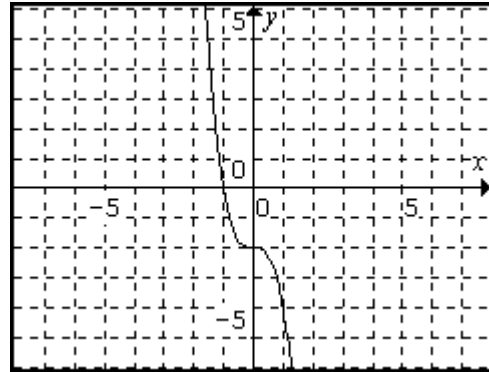
Shift left 1 unit

13.



Shift 4 units right

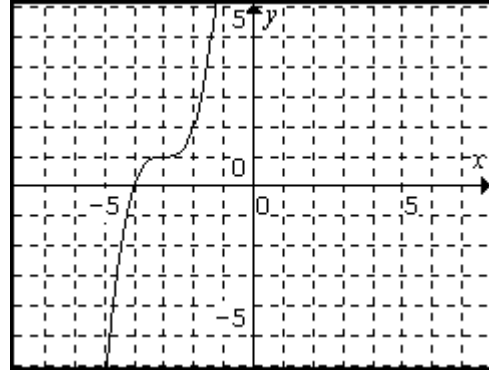
15.



Reflect about x-axis

Shift down 2 units

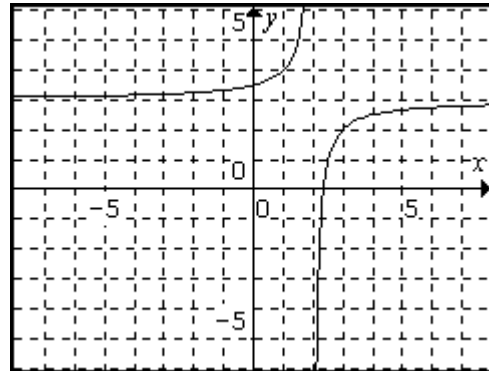
17.



Shift left 3 units

Shift up 1 unit

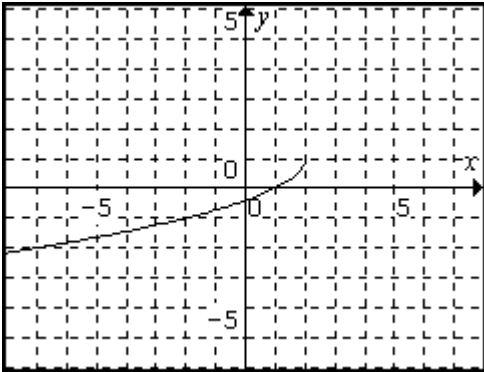
19.



Reflection about x-axis

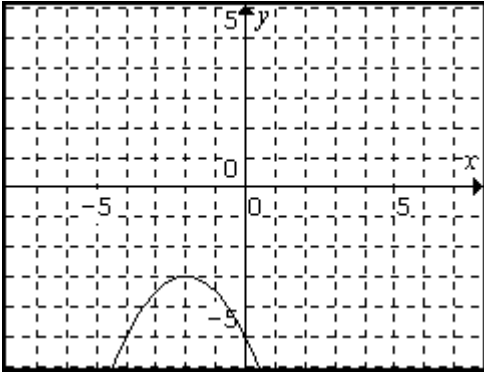
Shift right 2 units, up 3 units

21.



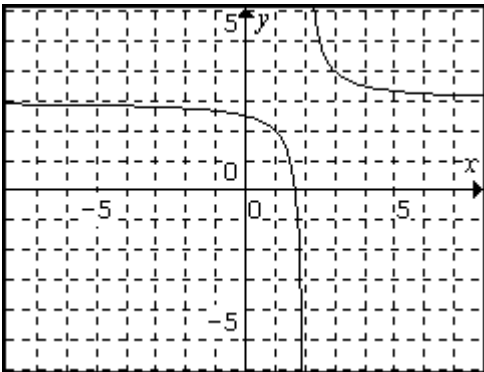
Reflect about the x-axis
Reflect about the y-axis
Shift right 2 units
Shift 1 unit up

23.



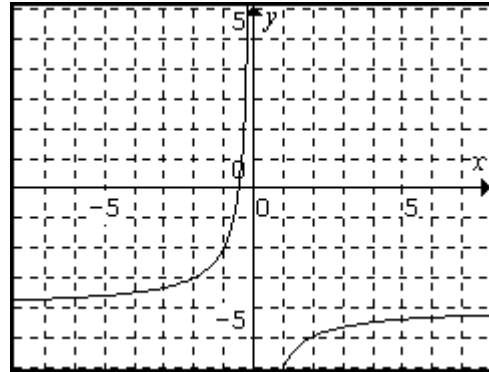
Reflect about x-axis
Shift left 2 units
Shift down 3 units

25.



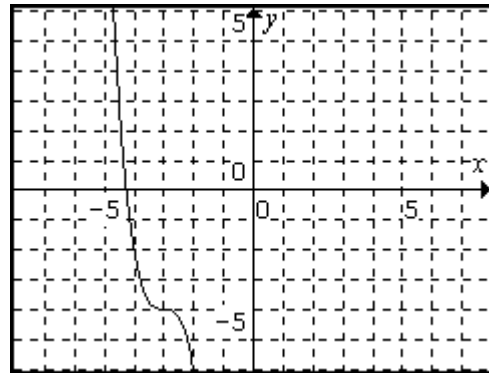
Shift Right 2 units
Shift up 3 units

27.



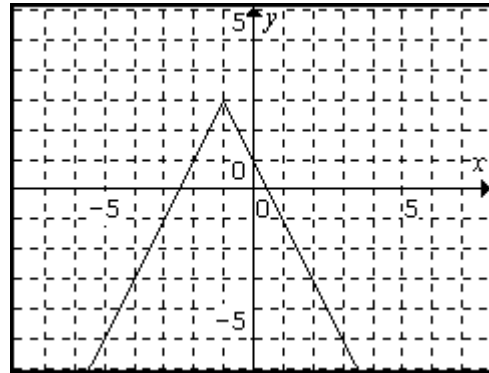
Reflection about x-axis
Shift down 4 units

29.



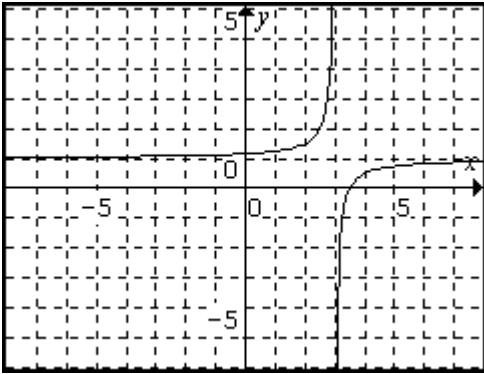
Reflection about x-axis
Left 3 units
Down 4 units

31.



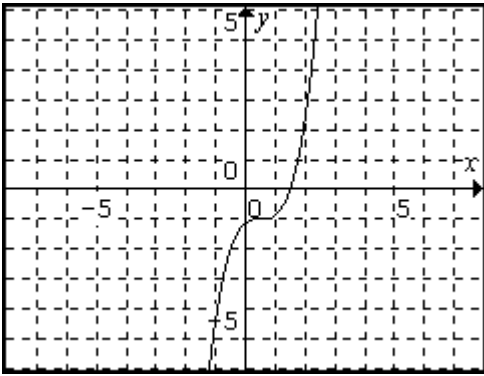
Reflection about x-axis
Shift left 1 unit
Shift up 3 units

33.



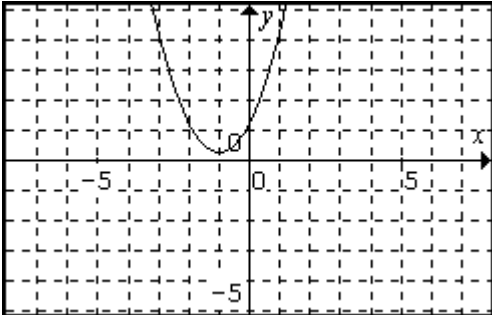
Reflection about x-axis
 Shift right 3 units
 Shift up 1 unit

35.



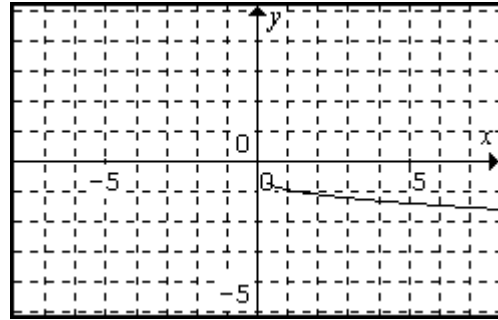
Shift right $\frac{1}{2}$ Unit
 Shift down 1 unit

37.



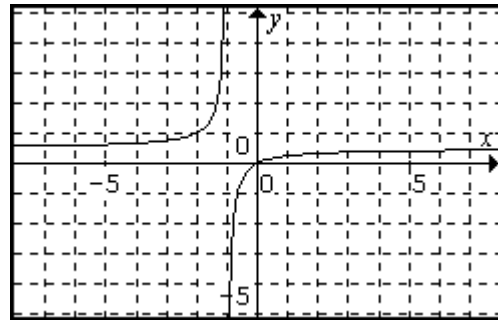
Shift left 1 unit
 Shift up $\frac{1}{4}$ unit

39.



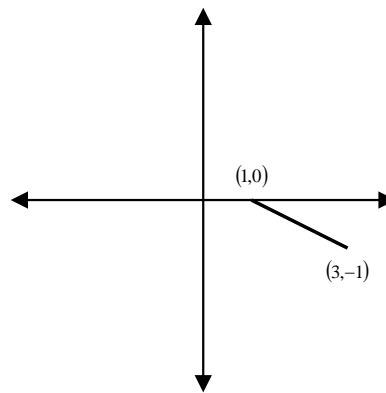
Reflection about x-axis
 Shift right $\frac{1}{3}$ unit
 Shift down $\frac{2}{3}$ unit

41.

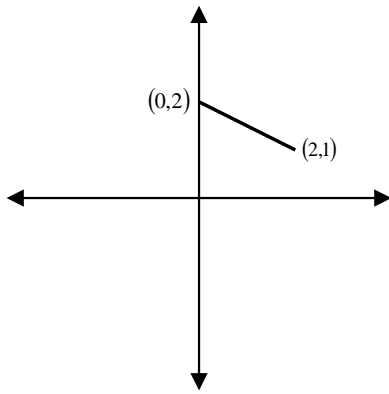


Reflection about x-axis
 Shift 1 unit left
 Shift up $\frac{1}{2}$ unit

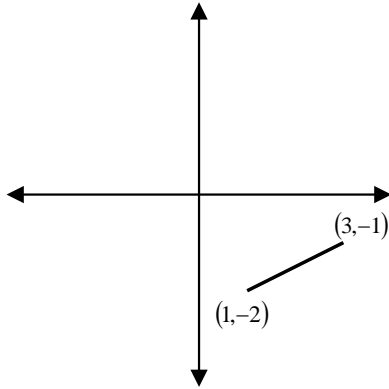
43. a.



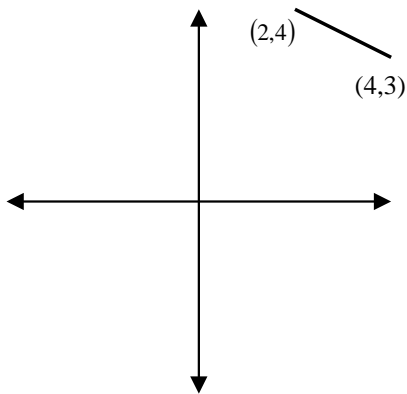
b.



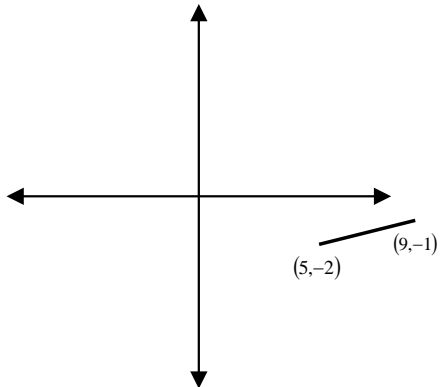
c.



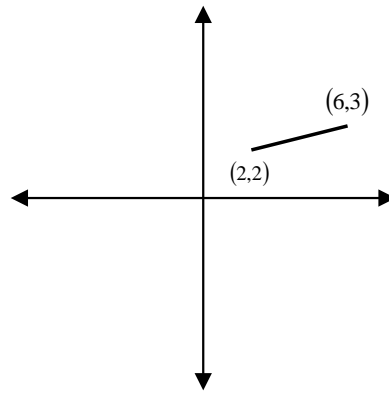
d.



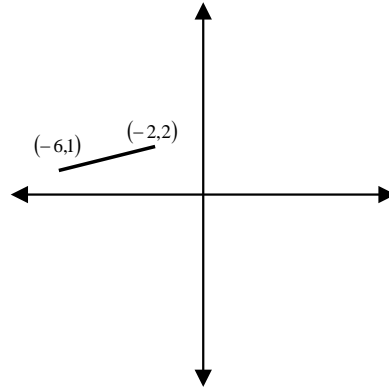
45. a.



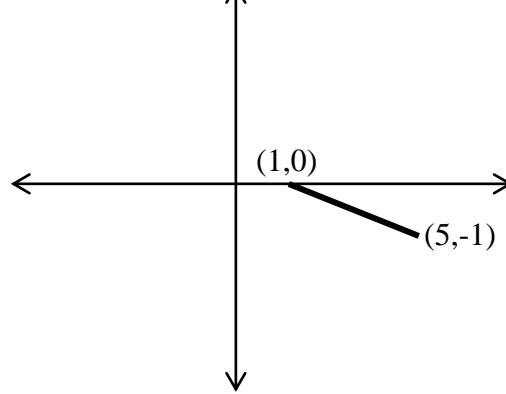
b.



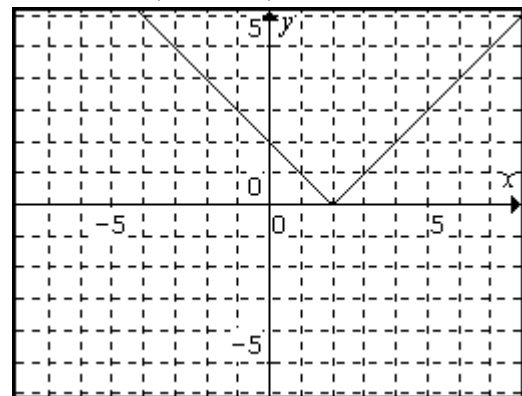
c.



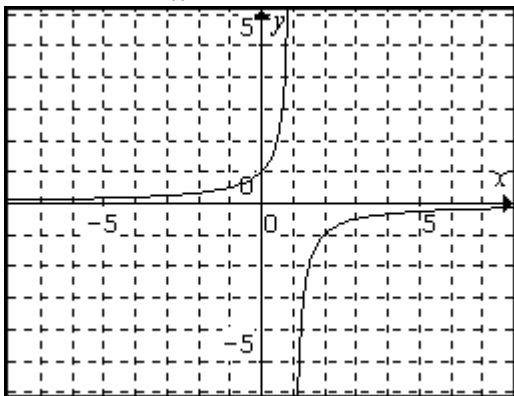
d.



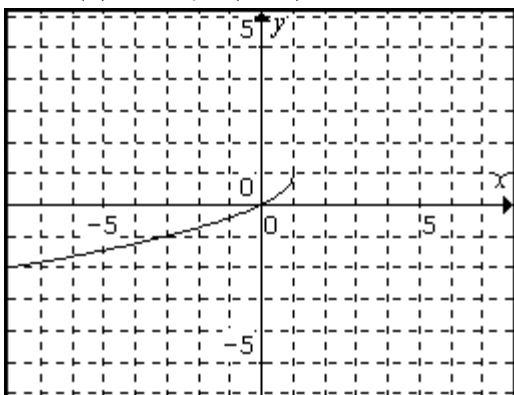
49. $f(x) = |-(x-2)|$



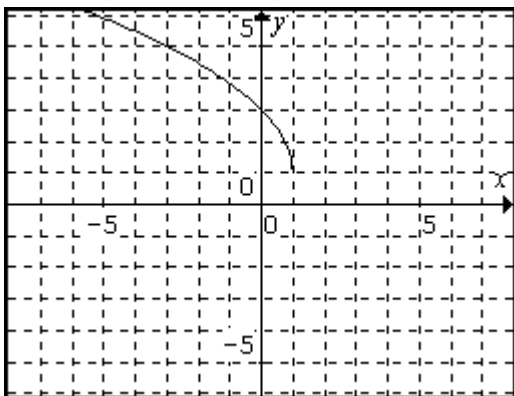
$$51. g(x) = -\frac{1}{x-1}$$



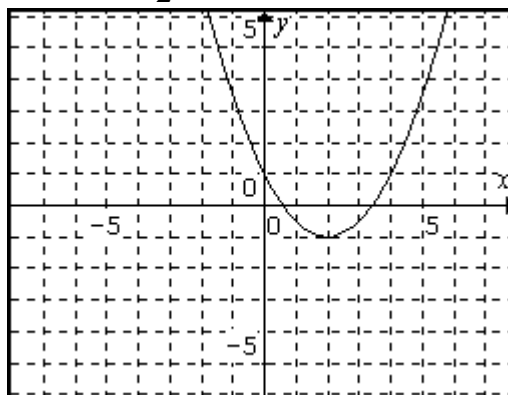
$$53. h(x) = 1 - \sqrt{-(x-1)}$$



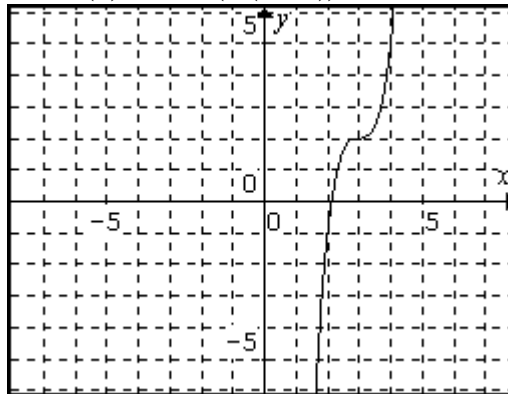
$$55. f(x) = 2\sqrt{-(x-1)} + 1$$



$$57. f(x) = \frac{1}{2}(-(x-2))^2 - 1$$



$$59. f(x) = 2 - 3(-(x-3))^3$$



Section 9.5

1. a. 1 b. 1 c. 1 d. 1

3. a. 0 b. 0 c. 0 d. 1

5. a. -1 b. 10 c. -7 d. 5

7. a. 1 b. -1 c. 1 d. 0

9. a. 1 b. -3 c. 1 d. -4

11. a. -5 b. -7 c. 0 d. not defined

13. a. 1 b. -4 c. 3 d. $\llbracket a - 1 \rrbracket$

15. a. 0 b. -4 c. 0 d. $\llbracket x + h - 1 \rrbracket$

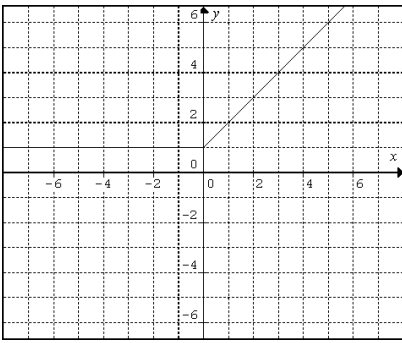
$$17. f(x) = \begin{cases} x+1 & \text{if } x \geq -1 \\ -x-1 & \text{if } x < -1 \end{cases}$$

$$19. f(x) = \begin{cases} 2x & \text{if } x \geq 0 \\ -2x & \text{if } x < 0 \end{cases}$$

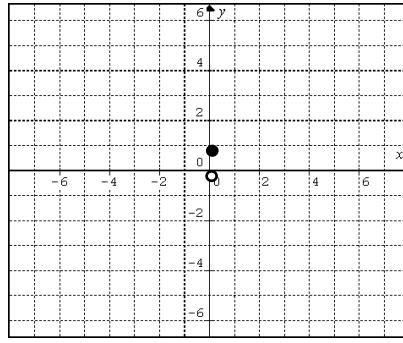
$$21. f(x) = \begin{cases} 2x-1 & \text{if } x \geq \frac{1}{2} \\ -2x+1 & \text{if } x < \frac{1}{2} \end{cases}$$

$$23. f(x) = \begin{cases} 1-4x & \text{if } x \geq \frac{1}{4} \\ -1+4x & \text{if } x < \frac{1}{4} \end{cases}$$

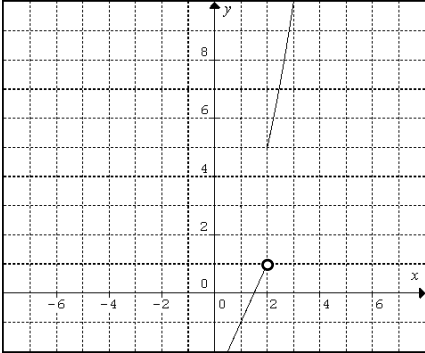
25.



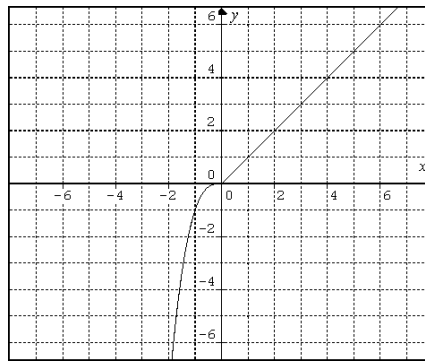
27.



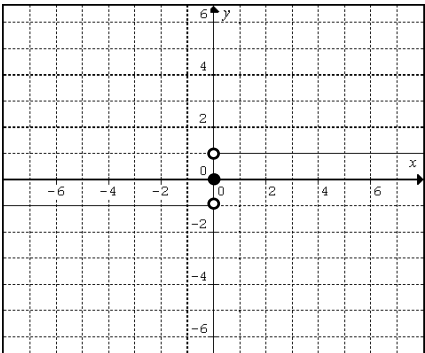
29.



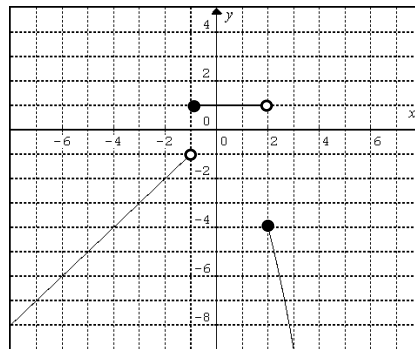
31.



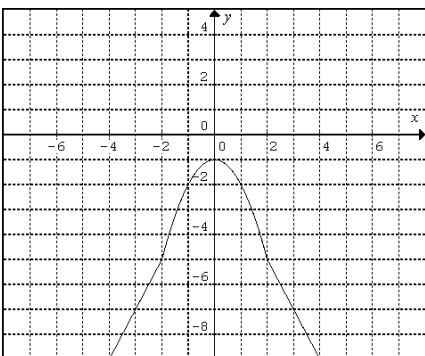
33.



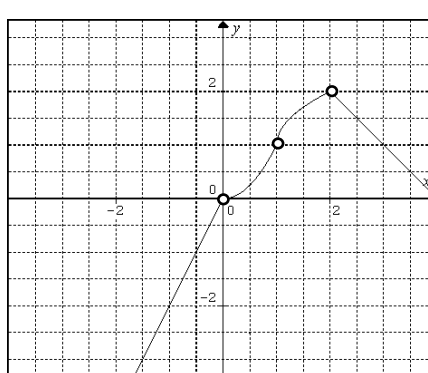
35.



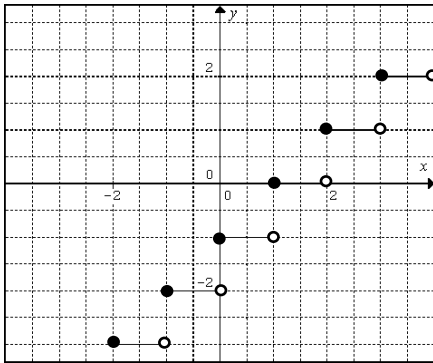
37.



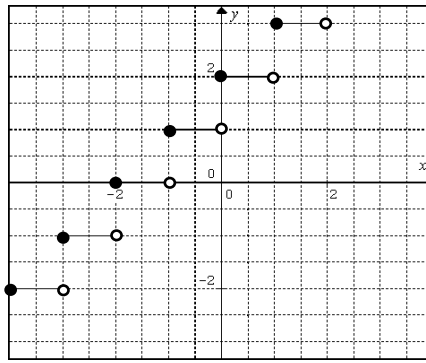
39.



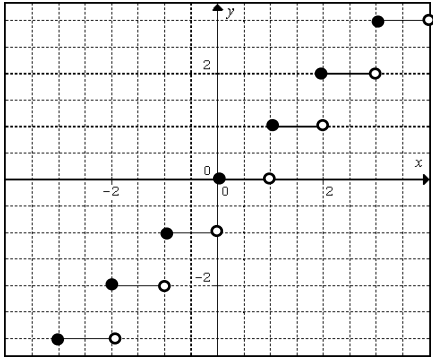
41.



43.



45.



Section 9.6

1. 1

7. $-a^2 + 4a - 2ah + 4h - h^2 - 2$

13. $\frac{x}{(x+1)^2}$

19. x

25. $\frac{2x^2 + 2}{x}$

31. 22

37. $6x^2 - 3x + 13$

43. 2

49. x

55. $\sqrt{|2t-1|+1}$

59. $a^4 - 4a^3b + 6a^2b^2 - 4a^2 - 4ab^3 + 8ab + b^4 - 4b^2 + 2$

61. $x + h - 1$

67. $\sqrt{x^2 - 1}$

3. $x^2 - 4x + 2$

9. $\frac{2ab-1}{a^2b^2-2ab+1}$

15. $\frac{x-1}{x+1}$

21. $\sqrt{x-1} + x^2 + 1$

27. $(x^2 + 1)\sqrt{x-1}$

33. 95

39. $9x + 4$

45. 2

51. $\sqrt{3}$

57. $a + 7$

63. $x - 1$

69. $x^4 - 4x^2 + 2$

5. -1

11. 1

17. $\frac{a-2}{a}$

23. $\frac{-x^3 - x + 2}{x}$

29. $\frac{x^3 + x}{2}$

35. 121

41. $\frac{1}{2}$

47. $\frac{x}{x+2}$

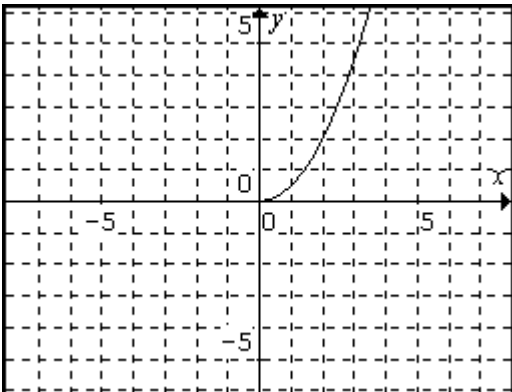
53. 3

65. $4x^2 - 4x - 1$

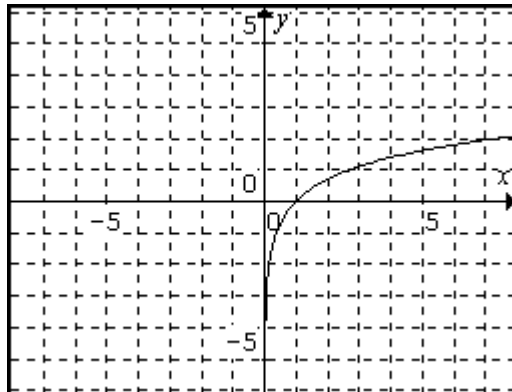
Section 9.7

1. $7a + 4 = 7b + 4$
 $7a = 7b$
 $a = b$
3. $\frac{1}{3}a + \frac{1}{4} = \frac{1}{3}b + \frac{1}{4}$
 $\frac{1}{3}a = \frac{1}{3}b$
 $a = b$
5. $\sqrt{a-1} = \sqrt{b-1}$
 $a-1 = b-1$
 $a = b$
7. $2\sqrt[3]{a} = 2\sqrt[3]{b}$
 $\sqrt[3]{a} = \sqrt[3]{b}$
 $a = b$
9. $\frac{1}{a+1} = \frac{1}{b+1}$
 $b+1 = a+1$
 $b = a$
11. No
13. Yes
15. No
17. $(f \circ g)(x) = x, (g \circ f)(x) = x$
19. $(f \circ g)(x) = x, (g \circ f)(x) = x$
21. $(f \circ g)(x) = x, (g \circ f)(x) = x$
23. $(f \circ g)(x) = x, (g \circ f)(x) = x$
25. $(f \circ g)(x) = x, (g \circ f)(x) = x$
27. $(f \circ g)(x) = x, (g \circ f)(x) = x$
29. $(f \circ g)(x) = x, (g \circ f)(x) = x$
31. $f^{-1}(x) = \frac{x-4}{7}$
33. $f^{-1}(x) = 3x - \frac{3}{4}$
35. $f^{-1}(x) = -4x + 2$
37. $g^{-1}(x) = x^2$
39. $g^{-1}(x) = -x^3 + 2$
41. $g^{-1}(x) = \sqrt[3]{x-4}$
43. $g^{-1}(x) = \sqrt{\frac{x-4}{2}}$
45. $h^{-1}(x) = \frac{1}{x}$
47. $h^{-1}(x) = \frac{1}{x} - 1$
49. $h^{-1}(x) = \frac{1}{x-3} + 1$
51. $f^{-1}(x) = \frac{(x-2)^3 + 3}{2}$
53. $f^{-1}(x) = \frac{-2x}{2-x}$
55. $g^{-1}(x) = \frac{-x-1}{x-1}$
57. $h^{-1}(x) = \sqrt[4]{\frac{x-8}{7}}$
59. $f^{-1}(x) = \frac{(x+1)^2}{4} - 1$
61. $f^{-1}(x) = \sqrt[3]{x^3 + 2}$
63. $f^{-1}(x) = \sqrt{\frac{1}{x+2}}$
65. $h^{-1}(x) = \frac{1}{(x-2)^3}$

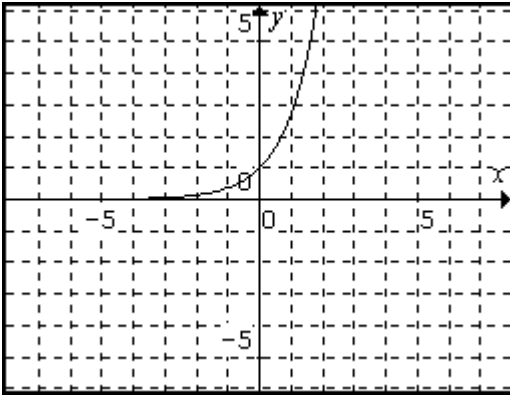
67.



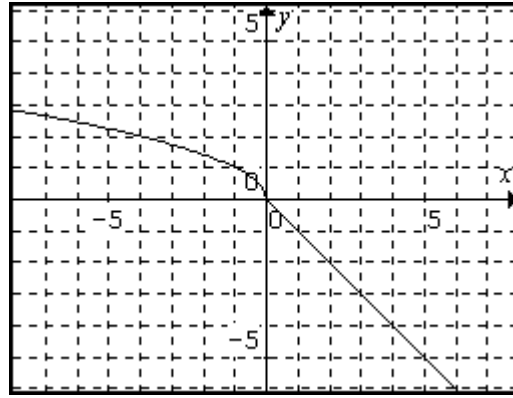
69.



71.



73.



75. $f^{-1}(x) = (x-1)^2$ $D: [1, \infty)$

77. $f^{-1}(x) = x^2 - 1$ $D: [0, \infty)$

79. $f^{-1}(x) = -x^4 + 2$ $D: [0, \infty)$

81. $f^{-1}(x) = \sqrt{x-1}$ 83. $f^{-1}(x) = -\sqrt{x} - 2$

Section 9.8

1. \$30; \$50

3. \$3250; 6 computers

5. 85.73 board feet; 166.69 board feet

7. 6 teams; 45 games

9. 2 seconds

11. 9.7-ft; 67.2-ft

13. 1.11 sec; 3.24-ft

15. \$50; \$480; Yes

17. $A(w) = 2w^2 + 3w$; 14 m^2 ; 3m by 9m

19. $A(l) = l^2 - l$; 90 sq ft; 5 ft by 4 ft

21. $A(b) = \frac{3b^2 + 2b}{2}$; 42.5 sq yd; base 4 yd, height 14 yd

23. $V(S) = \frac{\sqrt{\pi^3 S^3}}{6\pi^2}$; $\frac{2}{3}$

25. $A(w) = 25w - w^2$; 66 sq yd; 2 yd by 23 yd.

27. $A(C) = \frac{C^2}{4\pi}$; $\frac{64}{\pi} \approx 20.4 - yd^2$; $C = \frac{1}{2} yd$

29. $A(l) = \frac{l^2}{4\pi}$; $\frac{4}{\pi} \approx 1.27 - in^2$; 1 in

31. $A(x) = \frac{500x - x^2}{2}$; 31250 sq ft; impossible

33. $A(x) = \frac{400x - 3x^2}{2}$; 10650 sq ft; shorter side 20 ft, longer side 170 ft

35. $A(x) = 50x - 2x^2$; 252 sq yd; longer side of 20 yd shorter sine of 10 yd

37. 3 cm

39. 23.75 lbs

41. 25.3 lbs/in²

43. 6.4 ft

45. 2.6 in

47. 675 units

49. 6.4 hrs

51. 4 in

53. 146.7 lbs

55. 30 amps

57. 2250 lbs

59. 9.75 cm

61. 10 ft/sec