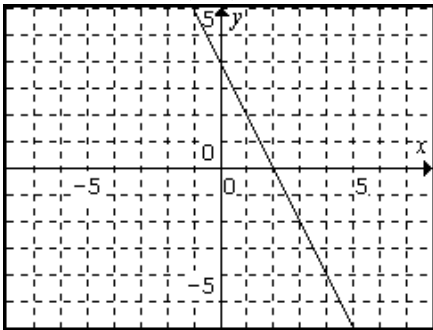
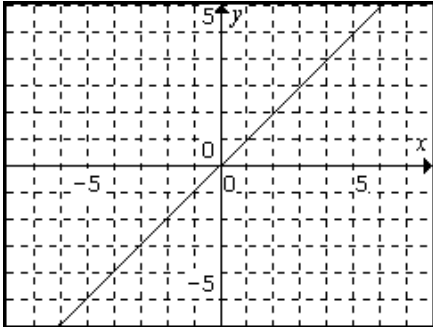


Section 9.1

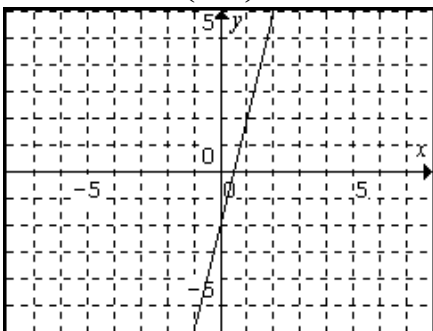
1. x-intercept =  $(2,0)$ , y-intercept =  $(0,4)$



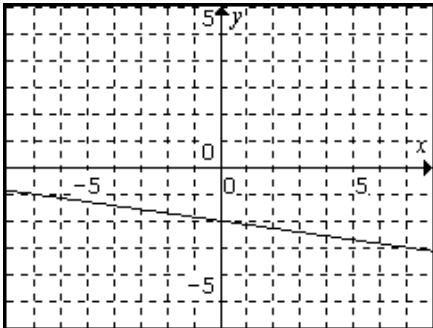
3. x-intercept =  $(0,0)$ , y-intercept =  $(0,0)$



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



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



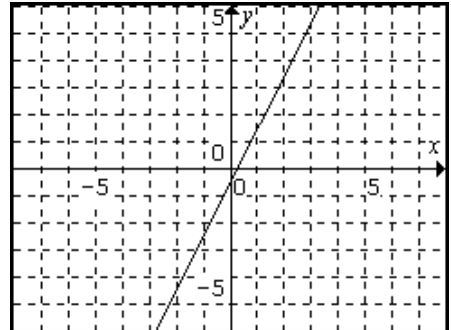
17.  $m = 2$

19.  $m = 1$

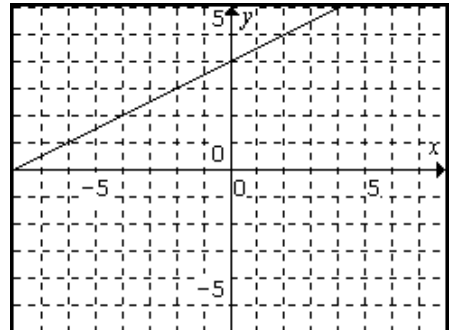
23.  $m = \text{undefined}$

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

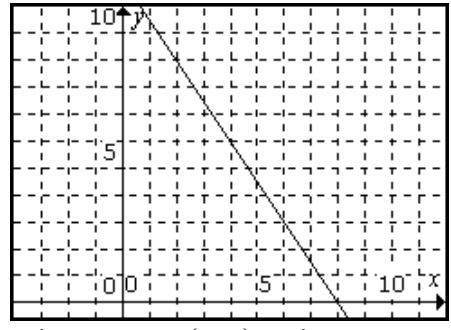
9. x-intercept =  $(\frac{1}{4}, 0)$ , y-intercept =  $(0, -\frac{1}{2})$



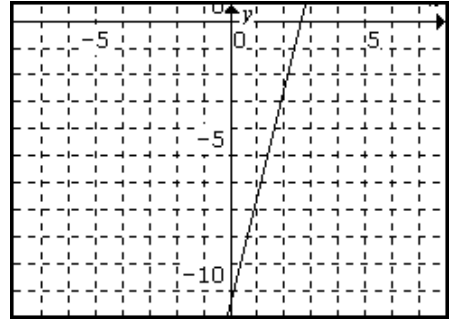
11. x-intercept =  $(-8, 0)$ , y-intercept =  $(0, 4)$



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



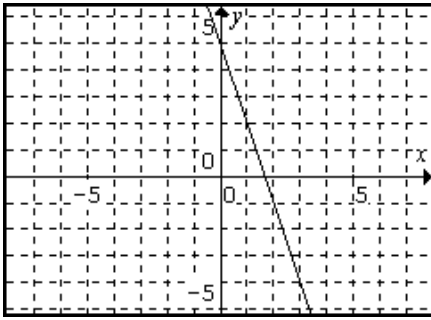
15. x-intercept =  $(\frac{21}{8}, 0)$ , y-intercept =  $(0, -\frac{21}{2})$



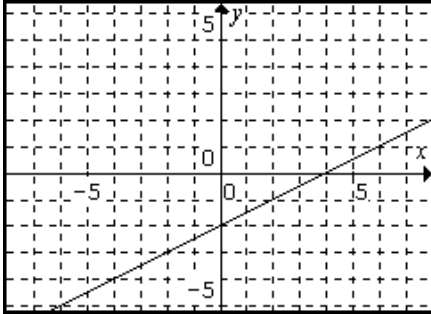
21.  $m = -\frac{1}{5}$

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

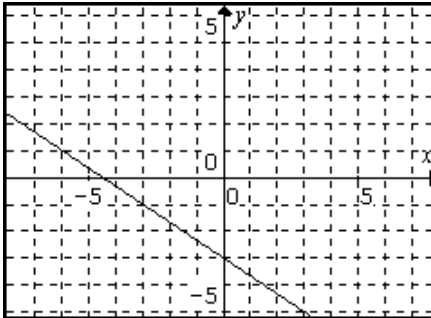
29.  $m = -3$



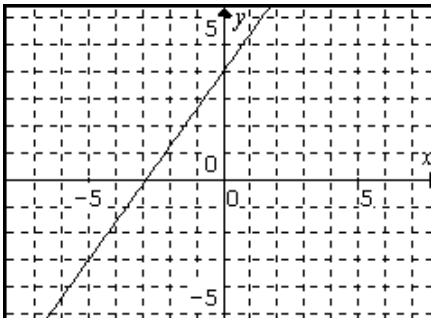
31.  $m = \frac{1}{2}$



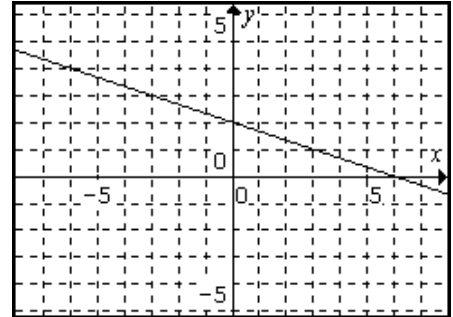
33.  $m = -\frac{2}{3}$



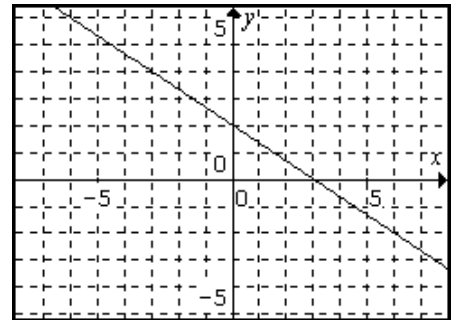
35.  $m = \frac{7}{5}$



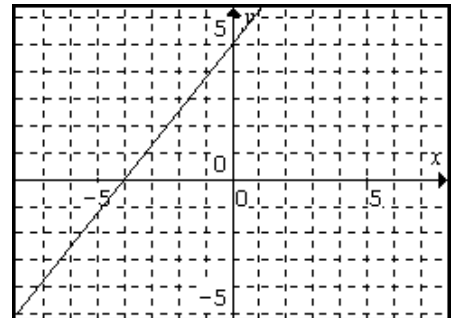
37.  $m = -\frac{1}{3}$



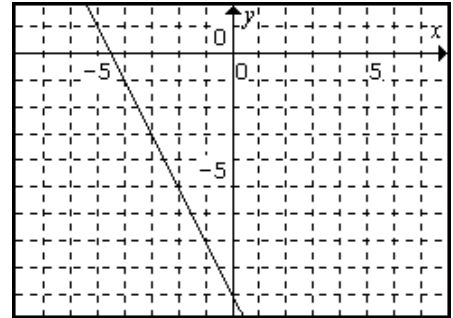
39.  $m = -\frac{2}{3}$



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

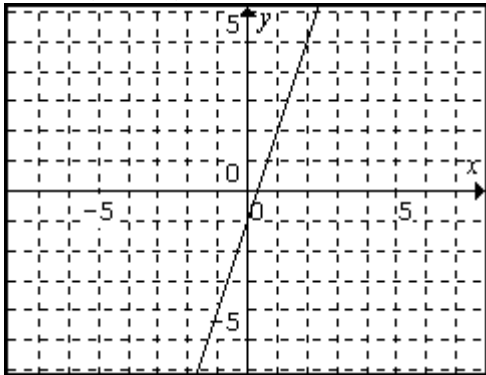
77.  $y = -\frac{5}{2}x + 10, 5x + 2y = 20$

Section 9.2

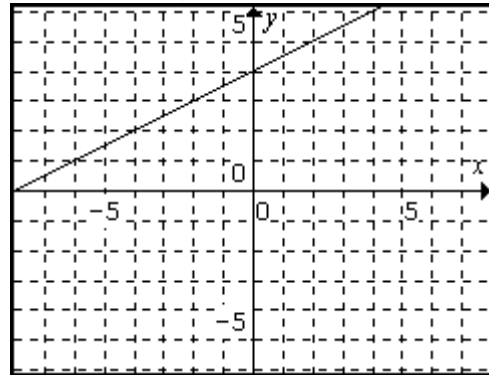
1. a. Function  $D: \{2,0,6,3,4\}$   $R: \{1,0,5,2,-1\}$   
 b. Not a Function  $D: \{1,2,-3\}$   $R: \{1,0,7\}$   
 c. Function  $D: \{a,e,i,o,u\}$   $R: \{A,E,I,O,U\}$   
 d. Function  $D: \{x_1,x_2,x_3,x_4\}$   $R: \{y_1,y_2\}$
3. a. Yes b. Yes c. No d. Yes
5. Yes 7. Yes 9. Yes 11. Yes 13. Yes
15. 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.  $D: (-\infty, \infty)$   
 $R: (-\infty, \infty)$

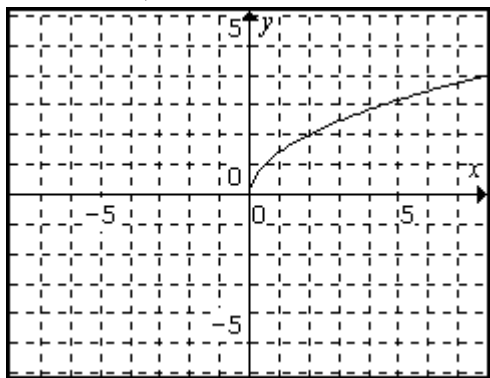


3.  $D: (-\infty, \infty)$   
 $R: (-\infty, \infty)$



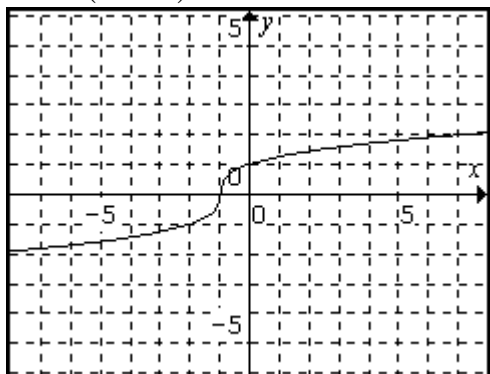
5.  $D: [0, \infty)$

$R: [0, \infty)$



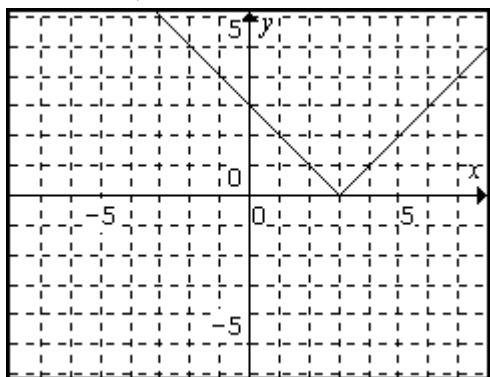
7.  $D: (-\infty, \infty)$

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



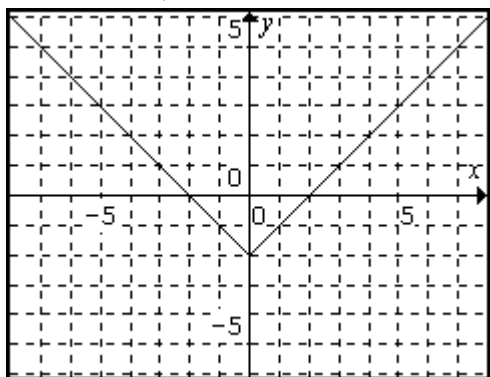
9.  $D: (-\infty, \infty)$

$R: [0, \infty)$



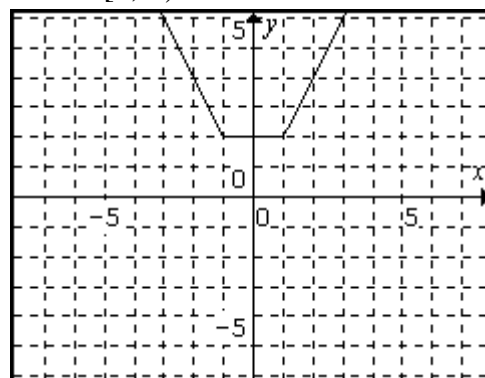
11.  $D: (-\infty, \infty)$

$R: [-2, \infty)$



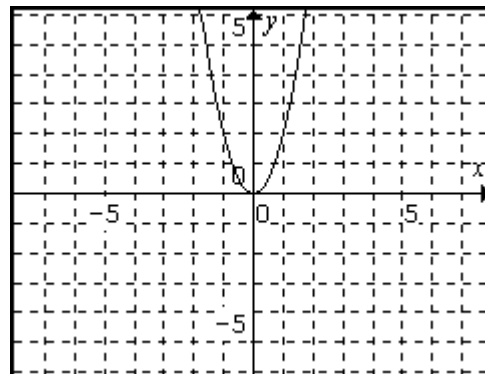
13.  $D: (-\infty, \infty)$

$R: [2, \infty)$



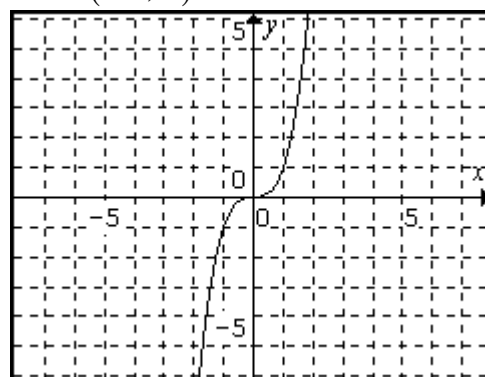
15.  $D: (-\infty, \infty)$

$R: [0, \infty)$



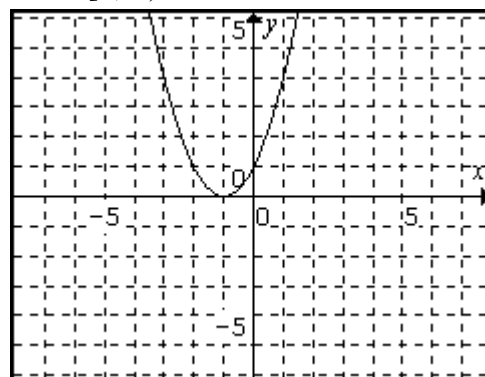
17.  $D: (-\infty, \infty)$

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



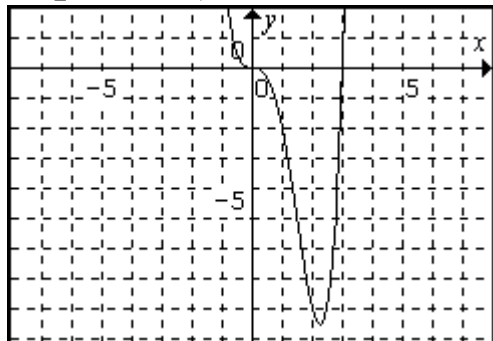
19.  $D: (-\infty, \infty)$

$R: [0, \infty)$



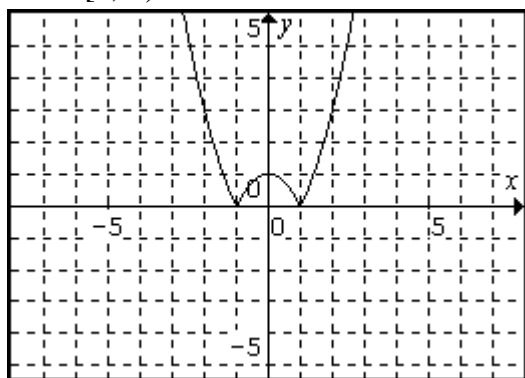
21.  $D: (-\infty, \infty)$

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



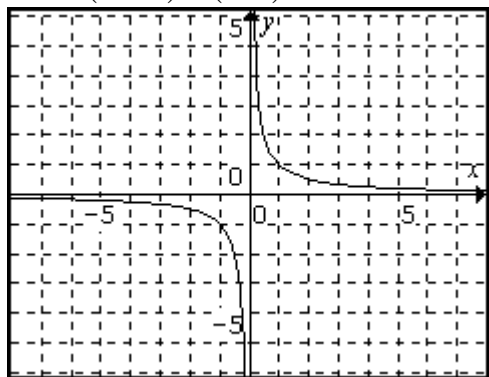
23.  $D: (-\infty, \infty)$

$R: [0, \infty)$



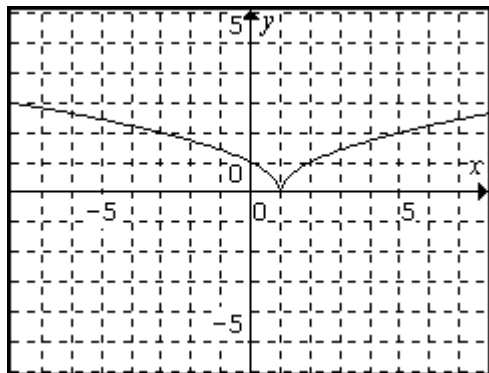
25.  $D: (-\infty, 0) \cup (0, \infty)$

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



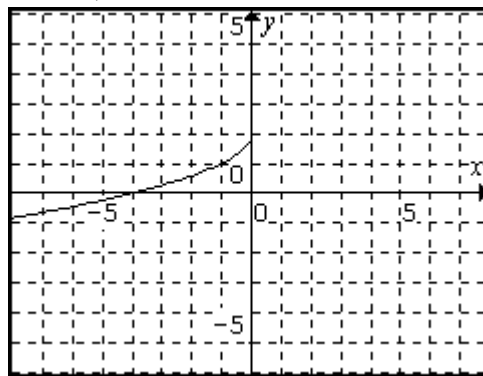
27.  $D: (-\infty, \infty)$

$R: [0, \infty)$

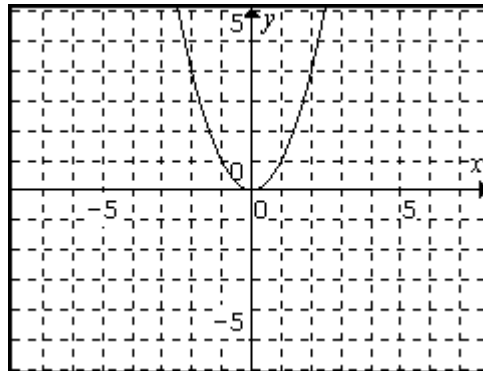


29.  $D: (-\infty, 0]$

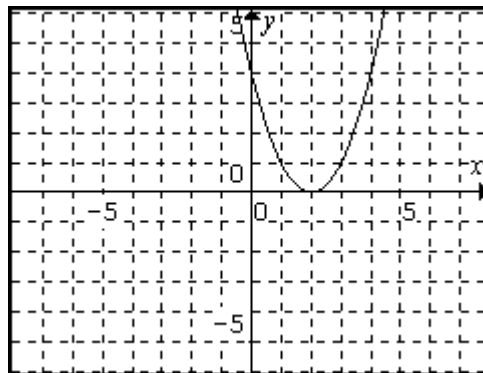
$R: (-\infty, 2]$



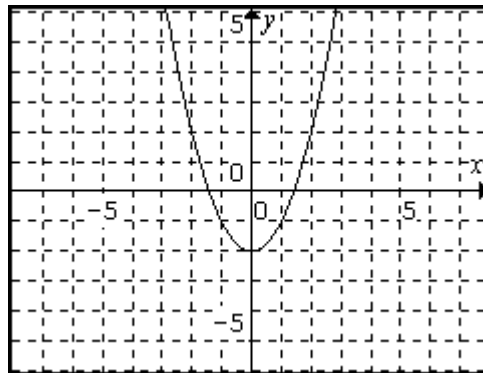
31. a.



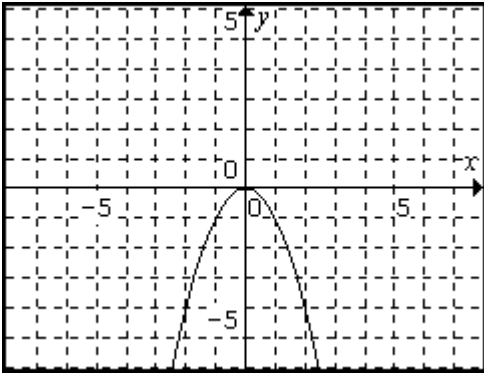
b.



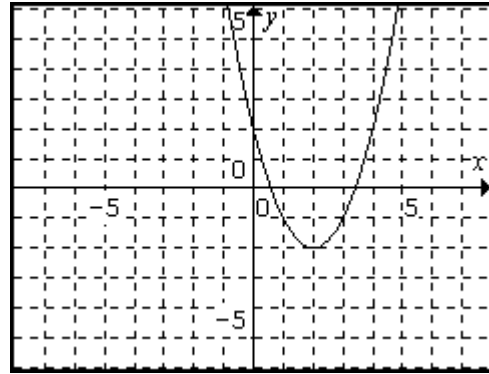
c.



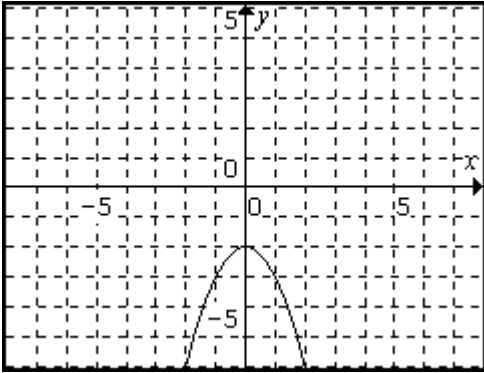
d.



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

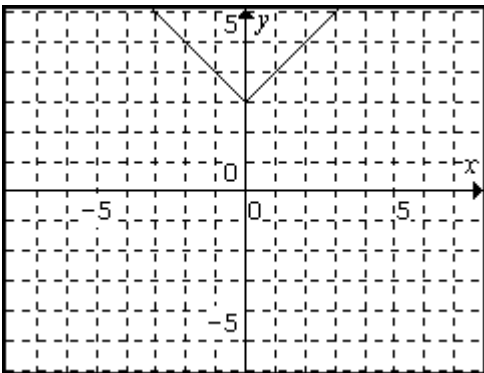
59.  $D: (-\infty, 0]$

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

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

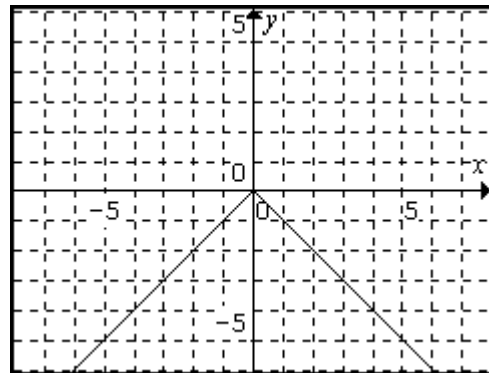
### Section 9.4

1.



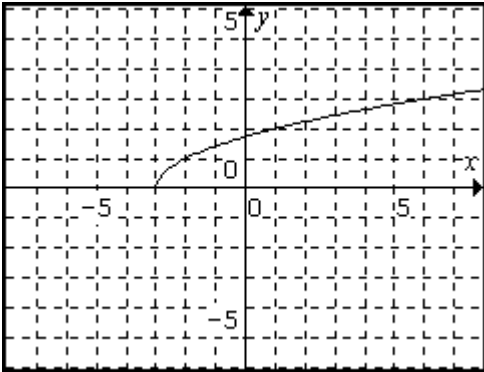
shift up 3 units

3.



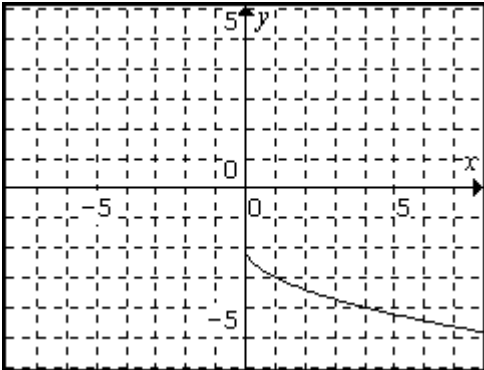
reflection about x-axis

5.



Shift left 3 units

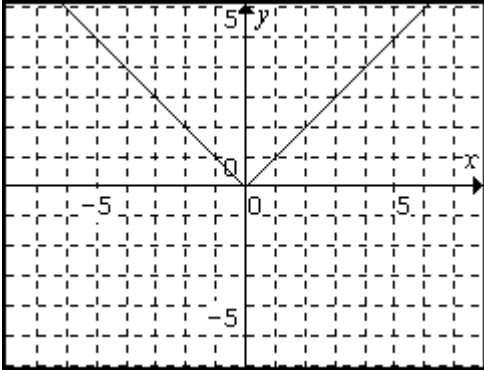
7.



Reflection about x-axis

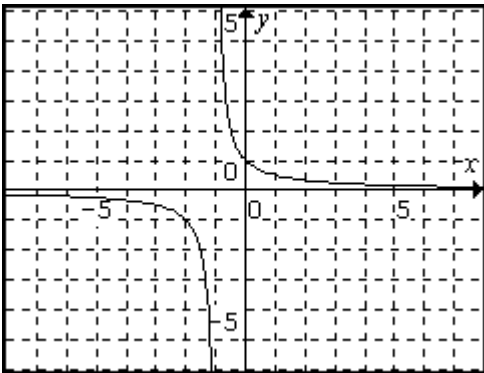
Shift down 2 units

9.



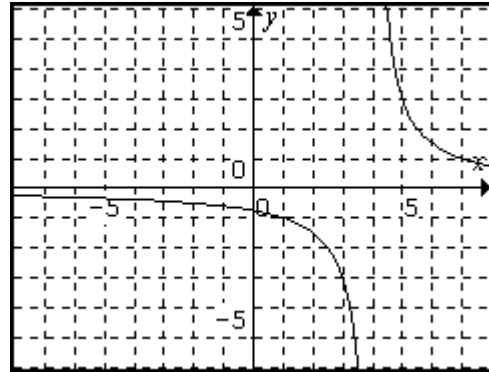
reflection about y-axis (no effect on graph)

11.



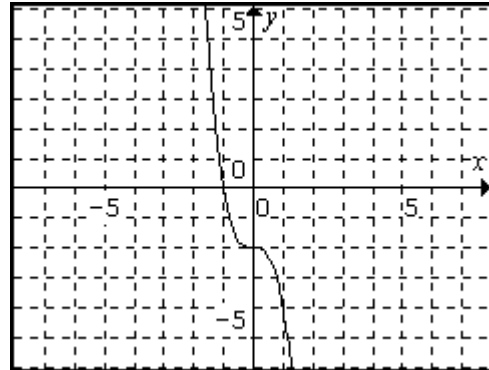
Shift left 1 unit

13.



Shift 4 units right

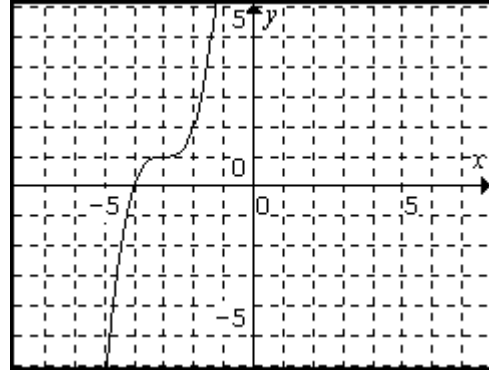
15.



Reflect about x-axis

Shift down 2 units

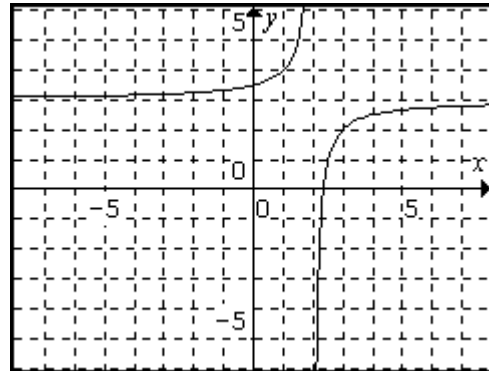
17.



Shift left 3 units

Shift up 1 unit

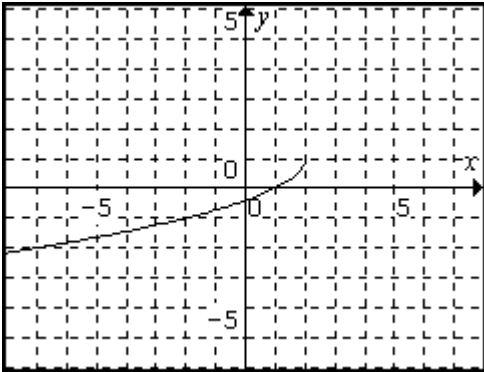
19.



Reflection about x-axis

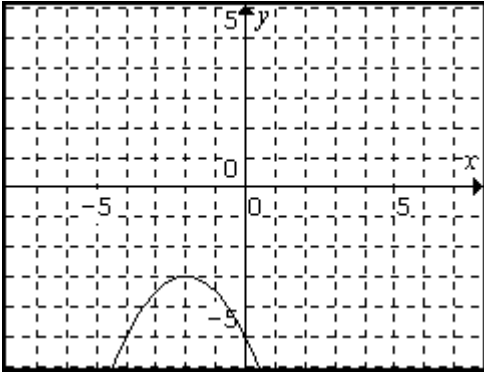
Shift right 2 units, up 3 units

21.



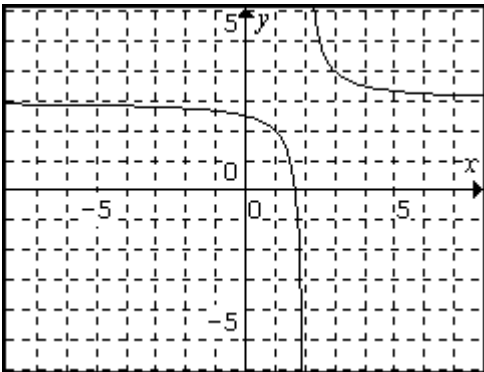
Reflect about the x-axis  
Reflect about the y-axis  
Shift right 2 units  
Shift 1 unit up

23.



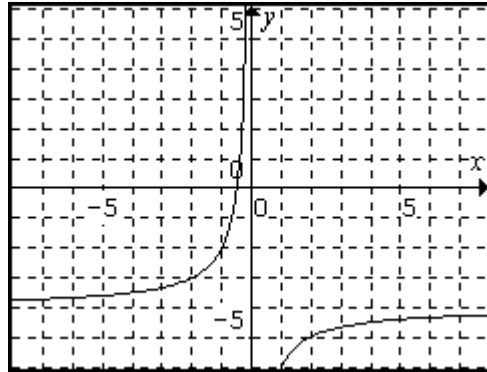
Reflect about x-axis  
Shift left 2 units  
Shift down 3 units

25.



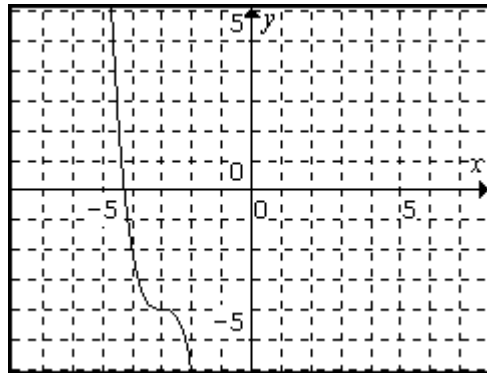
Shift Right 2 units  
Shift up 3 units

27.



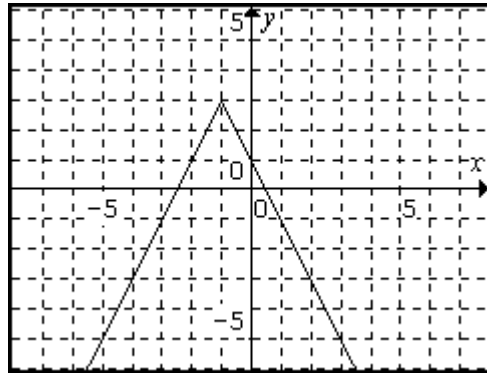
Reflection about x-axis  
Shift down 4 units

29.



Reflection about x-axis  
Left 3 units  
Down 4 units

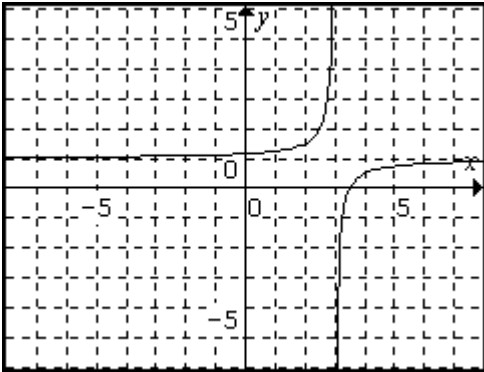
31.



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

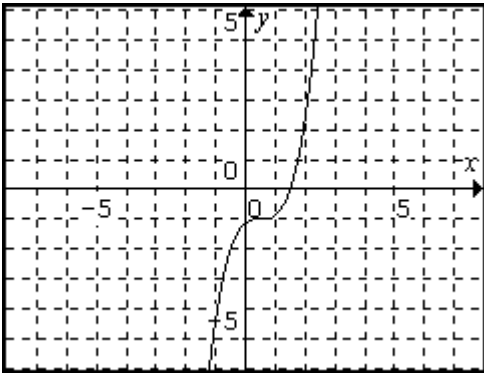


33.



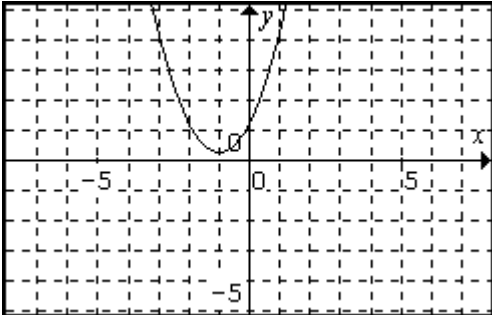
Reflection about x-axis  
 Shift right 3 units  
 Shift up 1 unit

35.



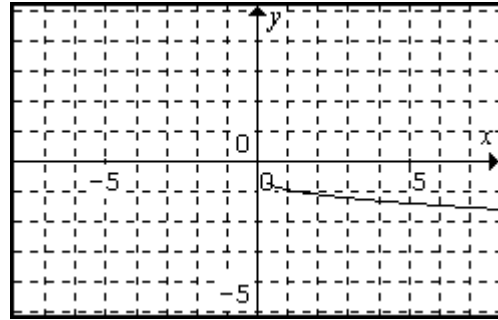
Shift right  $\frac{1}{2}$  Unit  
 Shift down 1 unit

37.



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

39.

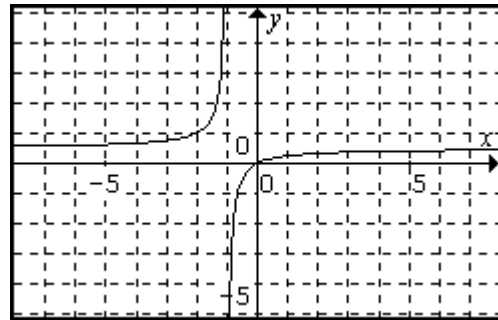


Reflection about x-axis

Shift right  $\frac{1}{3}$  unit

Shift down  $\frac{2}{3}$  unit

41.

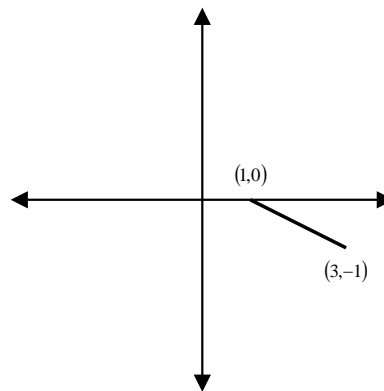


Reflection about x-axis

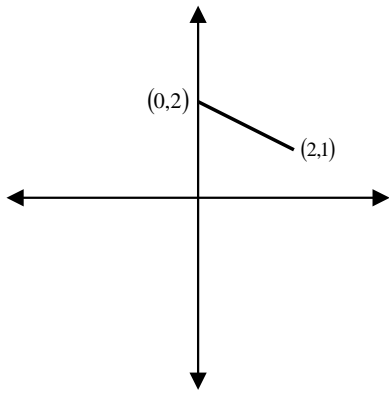
Shift 1 unit left

Shift up  $\frac{1}{2}$  unit

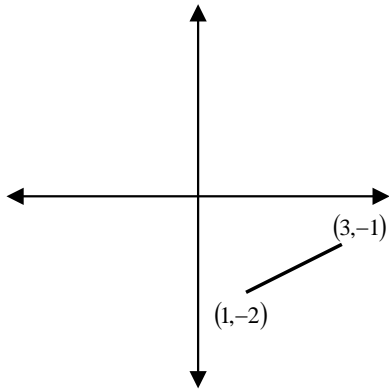
43. a.



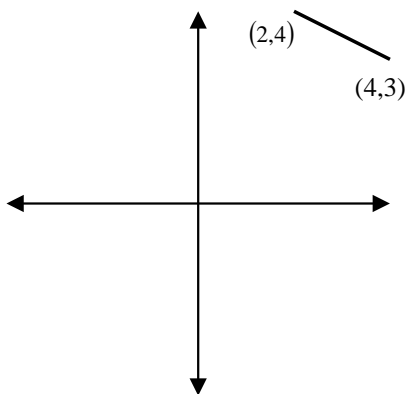
b.



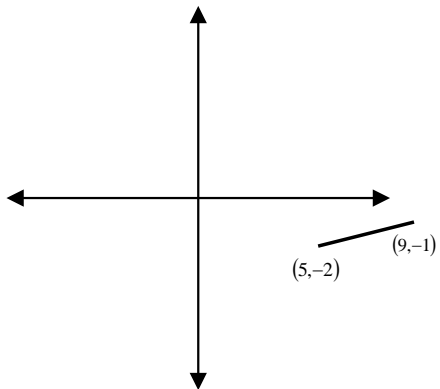
c.



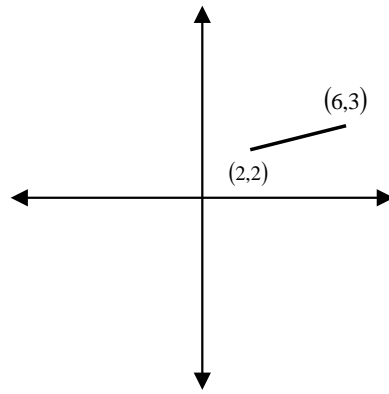
d.



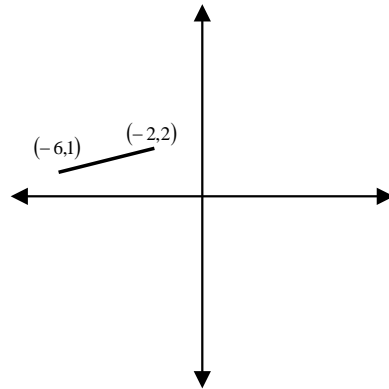
45. a.



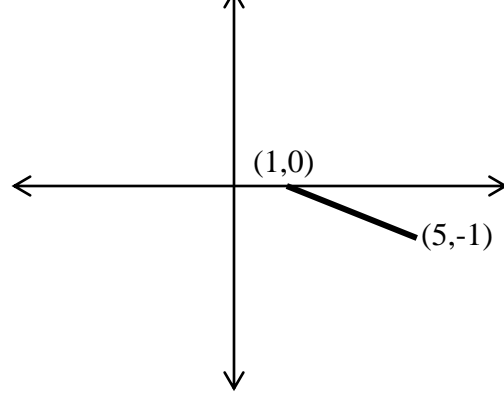
b.



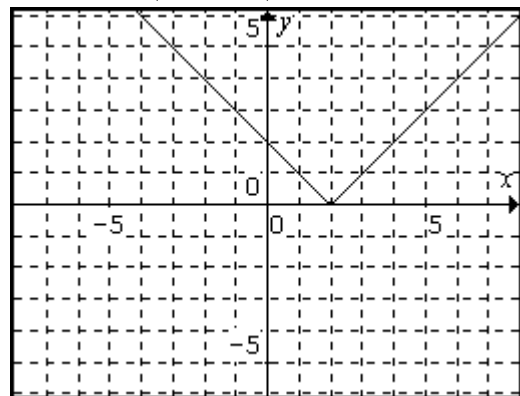
c.



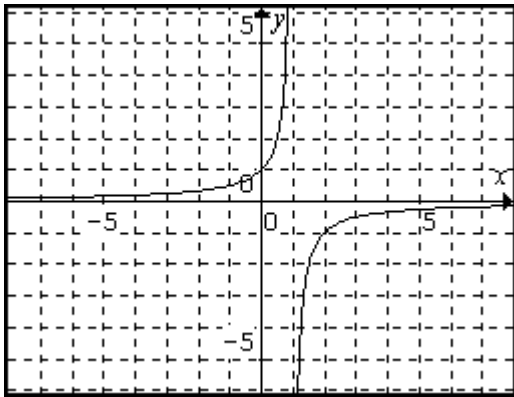
d.



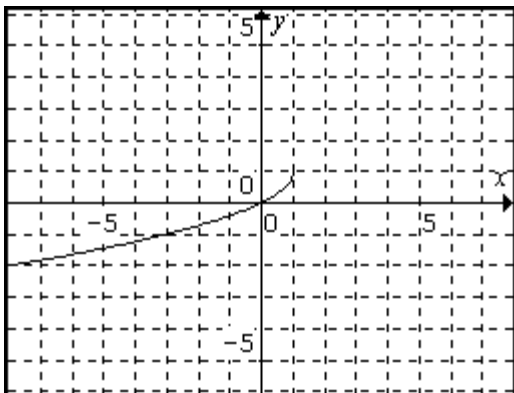
49.  $f(x) = |-(x-2)|$



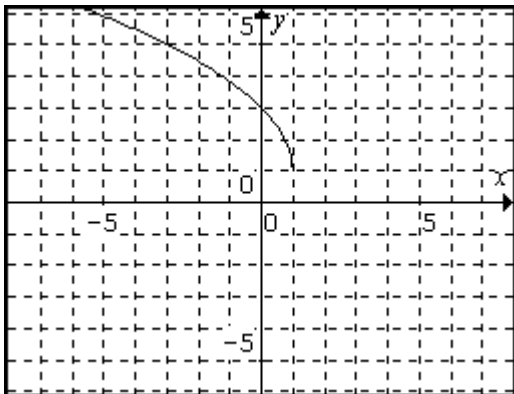
$$51. g(x) = -\frac{1}{x-1}$$



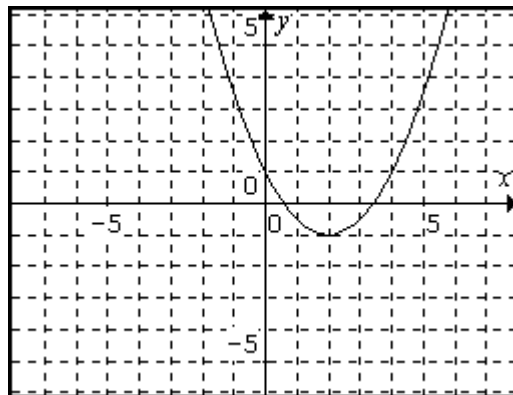
$$53. h(x) = 1 - \sqrt{-(x-1)}$$



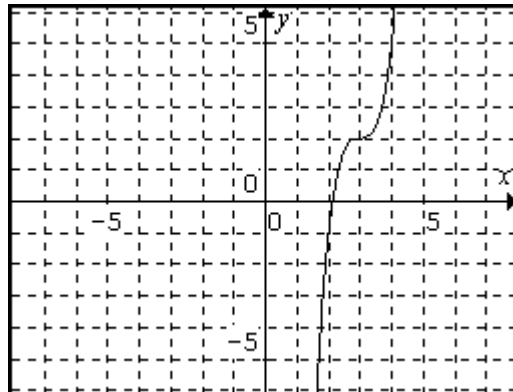
$$55. f(x) = 2\sqrt{-(x-1)} + 1$$



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



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



### Section 9.5

1. 1

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

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

19.  $x$

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

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

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

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

5. -1

11. 1

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

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

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

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

33. 95

39.  $9x+4$

45. 2

51.  $\sqrt{3}$

57.  $a+7$

63.  $x-1$

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

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 9.6

$7a+4=7b+4$

1.  $7a=7b$   
 $a=b$

$\frac{1}{3}a + \frac{1}{4} = \frac{1}{3}b + \frac{1}{4}$

3.  $\frac{1}{3}a = \frac{1}{3}b$   
 $a=b$

$\sqrt{a-1} = \sqrt{b-1}$

5.  $a-1=b-1$   
 $a=b$

$2\sqrt[3]{a} = 2\sqrt[3]{b}$

7.  $\sqrt[3]{a} = \sqrt[3]{b}$   
 $a=b$

$\frac{1}{a+1} = \frac{1}{b+1}$

9.  $b+1=a+1$   
 $b=a$

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.  $h^{-1}(x) = \sqrt[4]{\frac{x-8}{7}}$

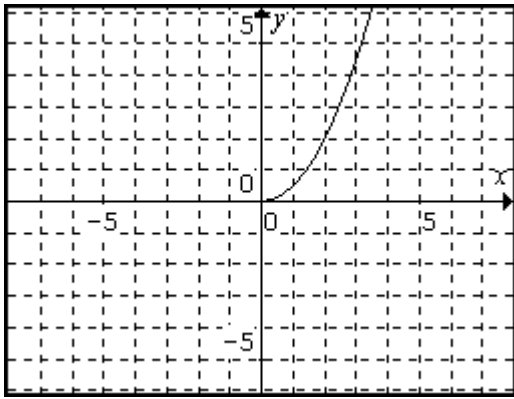
59.  $f^{-1}(x) = \frac{(x+1)^2}{4} - 1$

61.  $f^{-1}(x) = \sqrt[3]{x^3 + 2}$

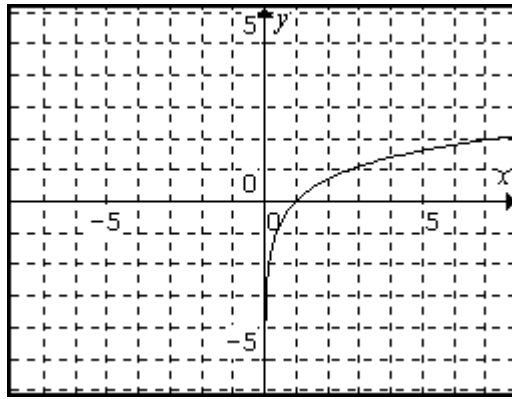
63.  $f^{-1}(x) = \sqrt{\frac{1}{x+2}}$

65.  $h^{-1}(x) = \frac{1}{(x-2)^3}$

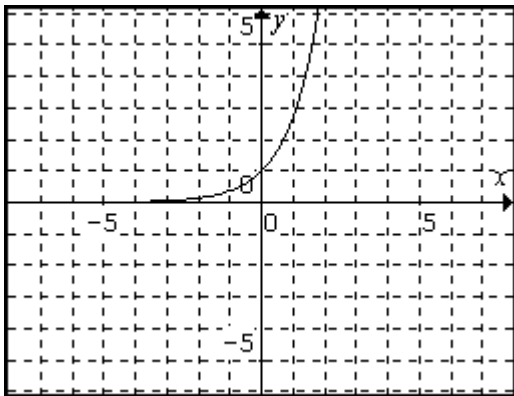
67.



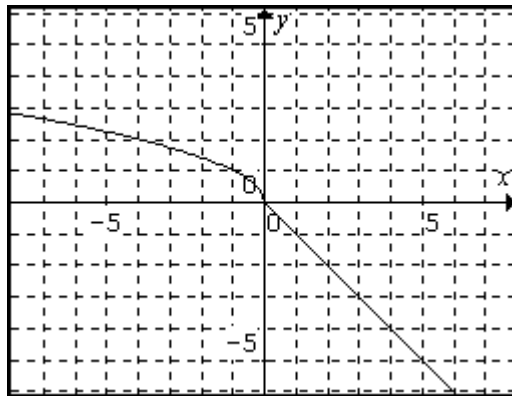
69.



71.



73.



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

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

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

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

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

## Section 9.7

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 9m19.  $A(l) = l^2 - l$ ; 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/in<sup>2</sup>

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

Section 9.8

1. vertical:  $x = 1$ , horizontal:  $y = 6$

5. vertical:  $x = -1$ ,  $x = 2$ , horizontal:  $y = 0$

9. vertical:  $x = -3/2$ ,  $x = 4$ , horizontal: none

13. vertical:  $x = -1$ ,  $x = 1$ , horizontal:  $y = 0$

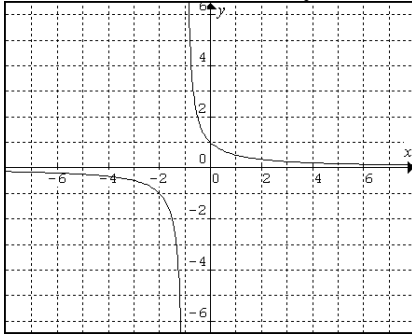
17. x-int: none, y-int:  $-2/3$

23. x-int:  $-2, 2$ , y-int:  $4/5$

29. x-int:  $0, -2, 10$ , y-int:  $0$

31. x-int: none, y-int:  $1$

vert:  $x = -1$ , horiz:  $y = 0$



3. vertical:  $x = 1/3$ , horizontal:  $y = 2/3$

7. vertical:  $x = 4$ ,  $x = -2$ , horizontal:  $y = 0$

11. vertical:  $x = 0$ ,  $x = 2$ , horizontal: none

15. vertical:  $x = -1$ ,  $x = 0$ , horizontal: none

19. x-int:  $1$ , y-int:  $-1$

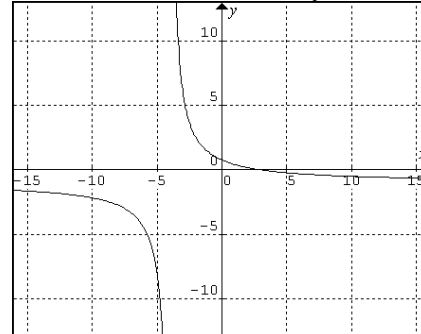
21. x-int:  $0, 1$ , y-int:  $0$

25. x-int:  $0$ , y-int:  $0$

27. x-int:  $-5, 5, -2, 2$ , y-int: none

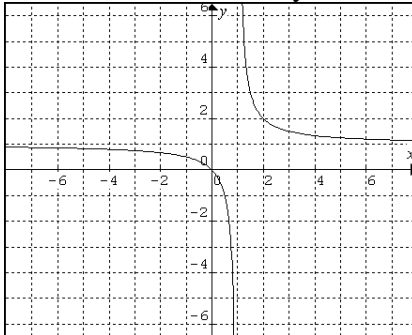
37. x-int:  $3$ , y-int:  $3/4$

vert:  $x = -4$ , horiz:  $y = -1$



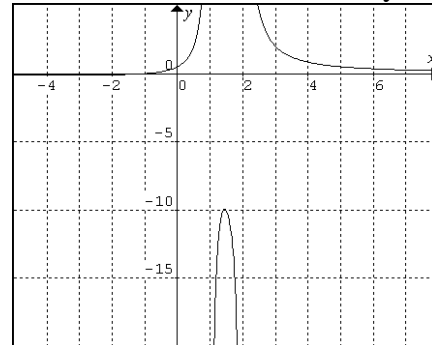
33. x-int:  $0$ , y-int:  $0$

vert:  $x = 1$ , horiz:  $y = 1$



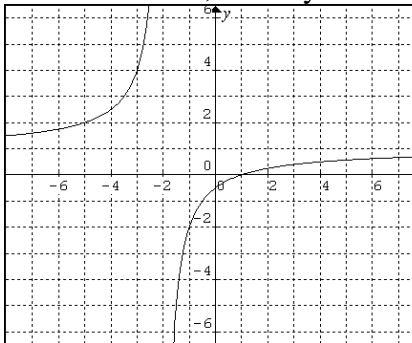
39. x-int:  $-1$ , y-int:  $1/2$

vert:  $x = 1, x = 2$ , horiz:  $y = 0$



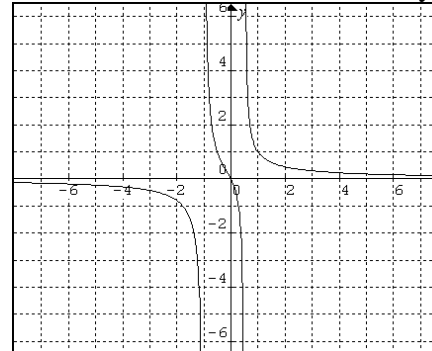
35. x-int:  $1$ , y-int:  $-1/2$

vert:  $x = -2$ , horiz:  $y = 1$

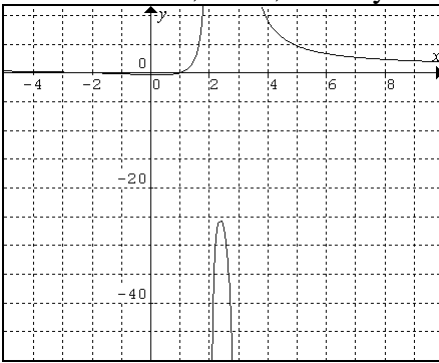


41. x-int:  $0$ , y-int:  $0$

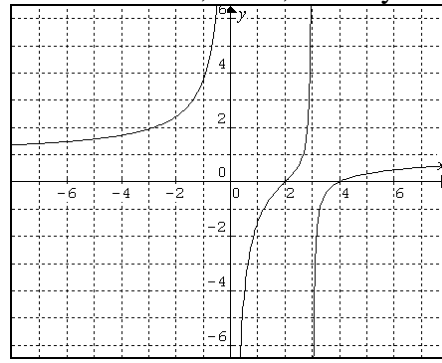
vert:  $x = 1/2, x = -1$ , horiz:  $y = 0$



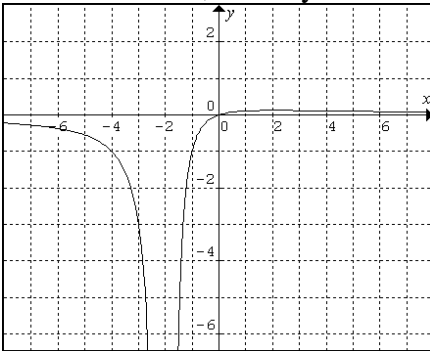
43. x-int: 1, -2, y-int:  $-1/3$   
 vert:  $x = 2, x = 3$ , horiz:  $y = 1$



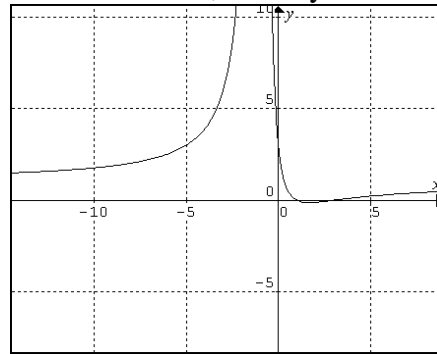
51. x-int: 2, 4, y-int: none  
 vert:  $x = 0, x = 3$ , horiz:  $y = 1$



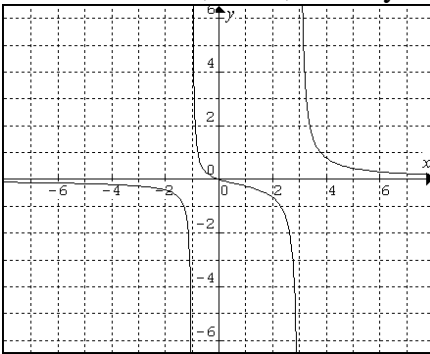
45. x-int: 0, y-int: 0  
 vert:  $x = -2$ , horiz:  $y = 0$



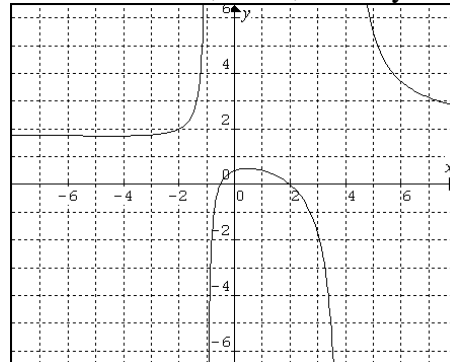
53. x-int: 3, 1, y-int: 3  
 vert:  $x = -1$ , horiz:  $y = 1$



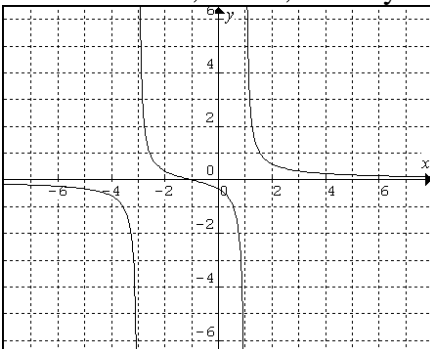
47. x-int: 0, y-int: 0  
 vert:  $x = -1, x = 3$ , horiz:  $y = 0$



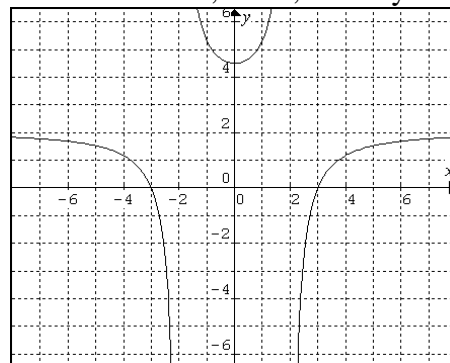
55. x-int:  $-1/2, 2$ , y-int:  $1/2$   
 vert:  $x = -1, x = 4$ , horiz:  $y = 2$



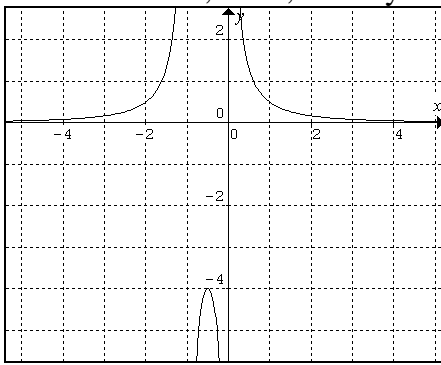
49. x-int: -1, y-int:  $-1/3$   
 vert:  $x = 1, x = -3$ , horiz:  $y = 0$



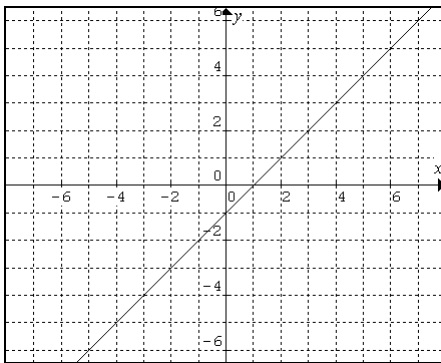
57. x-int: -3, 3, y-int:  $9/2$   
 vert:  $x = -2, x = 2$ , horiz:  $y = 2$



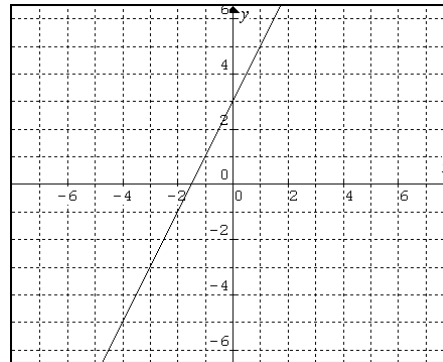
59. x-int: none, y-int: none  
 vert:  $x = -1$ ,  $x = 0$ , horiz:  $y = 0$



61.



63.



65.

