

79. $(2t^2 - s)^2$

81. $(3x + 5y^2)(9x^2 - 15xy^2 + 25y^4)$ 83. $(x + 3y)(x + 3y + 2)$

85. $\frac{3x-3}{x^2-4}$

87. $\frac{-4(3x^2 + 3x + h^2)}{x^3(x+h)^3}$

89. $\frac{\sqrt{c}}{d}$

91. $\frac{(y+x)}{x^2y^2(y-x)^2}$

93. $\frac{r^2+2rs}{s^2+2rs}$

95. $2y^3\sqrt{4x^2y}$

97. $\frac{3+5x}{x(\sqrt{5(1+x)}+\sqrt{2})}$

99. $\frac{ab}{7\sqrt{a^2b^2}}$

CAPITULO 2

EJERCICIO 2.1 (páginas 65-66)

1. Equivalente 3. Equivalente 5. No equivalente

9. -2 11. 3 13. 9/4 15. 1/3 17. 2

19. 3 21. 35/9 23. 3/16 25. -1/2 27. 2

29. 0 31. 4/5 33. -1 35. -4 37. 1

39. 3/2 41. 5 43. $\{w/w \neq 2\}$ 45. $\emptyset$ 47. 1

49. -5/3 51. 3 53. -1

55. La cuarta ecuación se obtiene al dividir cada lado de la tercera ecuación por $x + 1$. Sin embargo, $x + 1 = 0$ para $x = -1$. Por tanto las ecuaciones $x = x + 1$ y $0 = -1$ que se obtienen al continuar esta división no son equivalentes a la proposición original $x = -1$.

57. (a) $\frac{1}{16}$ (b) $\frac{1}{8}$ 59. 84 años 61. -68.2875°C

EJERCICIO 2.2 (páginas 74-77)

1. $r = C/2\pi$ 3. $r = I/ct$ 5. $r = 5/2\pi h$ 7. $m = y - b/x$ 9. $x = a(1 - y/b)$ 11. $R_1 = RR_2/R_2 - R$ 13. $n = \frac{a_n - a + d}{d}$ 15. $v_0 = s/t - gt/2$ 17. $l = \frac{a + Sr - S}{r}$

19. 12 y 38 21. 15, 16, 17 23. 13

25. 14% 27. US\$6,400 29. 183 1/3 millas

31. 4/3 h 33. 21.60 mph 35. 3.75 cuartos

37. 9,000 galones de gasolina corriente y 6,000 galones de primera calidad.

39. 120 kg 41. 16 minutos y 40 segundos

43. 11 h 45. 10 cm por 15 cm

47. 8, 12 y 10 cm 49. 2 cm 51. 47 53. 165

55. 13 monedas de US\$5 centavos y 17 monedas de US\$10 centavos.

57. 74 59. 30

61. (a) El 5% de US\$200 es 10, pero el impuesto es menor; (b) US\$9.52.

63. (a) No hay ninguna diferencia; (b) Siendo x el costo original de un artículo, tomar un descuento de $d\%$ pri-

mero y luego sumando $t\%$ del impuesto de ventas se representa mediante

$$\left(x - \frac{d}{100}x\right)\left(1 + \frac{t}{100}\right).$$

Sumar $t\%$ de impuesto a las ventas primero y luego tomar $d\%$ de descuento. Se da por

$$\left(x + \frac{t}{100}x\right)\left(1 - \frac{d}{100}\right).$$

Al factorizar, cada una de estas expresiones es igual a

$$\left(1 + \frac{t}{100}\right)(x)\left(1 - \frac{d}{100}\right)$$

65. (a)

$$(10\sqrt{v} + 10.45 - v)(33 - T) = (10\sqrt{2.2} + 10.45 - 2.2)(33 - T')$$

$$(b) T' = \frac{33 - (10\sqrt{v} + 10.45 - v)(33 - T)}{10\sqrt{2.2} + 8.25}$$

(c) -18.8°C

EJERCICIO 2.3 (páginas 86-88)

1. -4, 4 3. -1, 1/2 5. $-\frac{1}{3}$ 7. $-\frac{1}{2}$ 9. $-\frac{1}{5}, \frac{-2}{5}$ 11. $-\frac{1}{5}, \frac{1}{5}$ 13. -9, 0, 9 15. $-\frac{5}{2}, 0, \frac{5}{2}$ 17. $-\sqrt{17}, \sqrt{17}$ 19. $-5 - \sqrt{5}, -5 + \sqrt{5}$ 21. $-1 - \sqrt{3}, -1 + \sqrt{3}$ 23. $-b, b$ 25. $0, 4bc$ 27. $-1 \pm \sqrt{3}$ 29. $-\frac{5}{2}, \frac{7}{2}$ 31. $\sqrt{2} \pm 1$ 33. $2 - \frac{\sqrt{35}}{3}, 2 + \frac{\sqrt{35}}{3}$ 35. $-1, \frac{1}{3}$ 37. $\frac{3}{2}$ 39. $-\frac{\sqrt{3}}{3}, \sqrt{3}$ 41. Sin soluciones reales. 43. $\frac{1 \pm \sqrt{3}}{2}$ 45. $\pm \frac{\sqrt{2}}{2}, \pm \sqrt{2/3}$ 47. $\frac{1}{3}, 4$ 49. $3 - 3\sqrt{3}, 3 + \sqrt{3}$ 51. -7, 553. $-2\sqrt{2}, 0, 2\sqrt{2}$ 55. $\pm \sqrt{15}$ 57. $r = \sqrt{A/\pi}$ 59. $r = \frac{1}{2} \left(-h \pm \sqrt{h^2 + \frac{2A}{\pi}} \right)$ 61. $r = \sqrt{g(m_1 m_2)/F}$ 63. 2 y 18

65. -1/2 67. 12 y 14

69. 10 horas y 11 horas con 40 minutos.

71. 18 m por 20 m 73. 1,716 pulg²

75. 45 cm, 60 cm y 75 cm 77. 1.47 horas

79. 6 millas por hora 81. 14.15 horas

83. 5 metros 85. 14 pulg. por 42 pulg.

87. 22.95 m

89. Siendo T el área de uno de los cuatro (4) triángulos rectángulos, entonces $c^2 = 4T + (b-a)^2$ o $c^2 = 4T + b^2 - 2ba + a^2$.

Ya que $T = 1/2ba$,

entonces, $c^2 = 4(1/2ba) + b^2 - 2ba + a^2 = b^2 + a^2$.

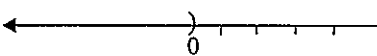
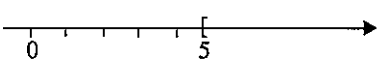
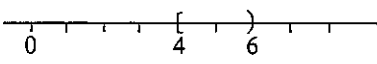
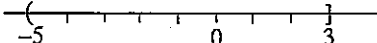
EJERCICIO 2.4 (páginas 92-93)

1. $0+10i$
7. $2-13i$
13. $1-5i$
19. $20-21i$
25. 1
31. $\frac{20}{41} - \frac{16}{41}i$
37. 1
43. $\frac{4}{25} + \frac{3}{25}i$
49. $x=-4, y=-5$
55. $\pm \frac{\sqrt{3}}{3}i$
61. $\frac{1}{8} \pm \frac{1}{8}\sqrt{31}i$
65. $z = \pm \left(\frac{\sqrt{2}}{2} \pm \frac{\sqrt{2}}{3}i \right)$
3. $6\sqrt{3} - 6\sqrt{3}i$
9. $-5+13i$
15. $7-56i$
21. -10
27. -1
33. $1/2 + i/2$
39. $-6/53 + \frac{32}{53}i$
45. $\frac{22}{5} - \frac{41}{5}i$
51. $x=-4, y=-5$
57. $\frac{1}{3} \pm \frac{\sqrt{2}}{3}i$
63. $\pm i, \pm 2i$
5. $1+5i$
11. $-7+11i$
17. $1+4i$
23. $-10+10i$
29. $3/25 + 4i/25$
35. $-4-6i$
41. $-\frac{11}{101} + \frac{9}{101}i$
47. $x=2, y=\frac{3}{2}$
53. $\pm 3i$
59. $-\frac{1}{2} \pm \frac{3}{2}i$

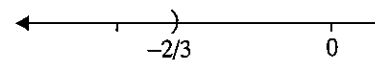
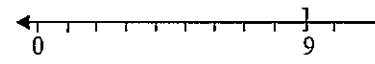
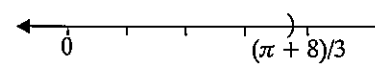
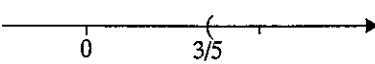
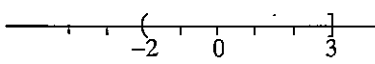
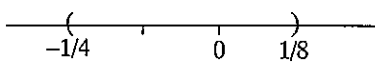
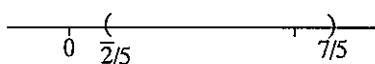
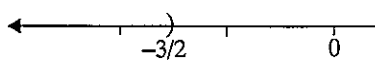
EJERCICIO 2.5 (páginas 98-100)

1. 1
7. $z = -3/4$
13. $-11, -73/27$
19. $2y-4$
25. 0
31. $9y36$
37. $15/4$
43. $a = \sqrt{c^2 - b^2}$
47. $r = (g_R)^{1/3} \left(\frac{TR}{2\pi} \right)^{2/3}$
53. $19/2$
59. 49.9 millas
3. $-3 \pm 2\sqrt{3}$
9. $-1y32,768$
15. $\pm \sqrt{23/3}$
21. 0
27. 10
33. $-1/4, 3/4$
39. $\emptyset$
45. $f' = \frac{1}{K^{1/3}} \sqrt{(f'')^{2/3} - K^{2/3}}$
49. 0.39, -1.72
51. 308.95
57. $a = 98.20 \text{ cm}, h = 196.40 \text{ cm}, l = 49.10 \text{ cm}$
61. 44.3 s
63. 2.6 m/s

EJERCICIO 2.6 (páginas 104-105)

1. $(-\infty, 0)$ 
3. $[5, \infty)$ 
5. $[4, 6)$ 
7. $(-5, 3]$ 

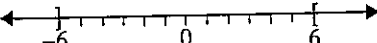
9. V 11. V 13. V

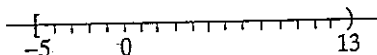
15. $x+3 > -2$
 $x+3-3 > -2-3$ [por (i)]
 $x > -5$
17. $2/3x+10 \leq 4$
 $2/3x+10-10 \leq 4-10$ [por (i)]
 $2/3x \leq -6$
 $3/2 (2/3x) \leq 3/2 (-6)$ [por (ii)]
 $x \leq -9$
19. $x/2 - 1/3 \leq 2/3x$
 $x/2 - x/2 - 1/3 \leq 2/3x - x/2$ [por (i)]
 $-1/3 \leq 1/6x$
 $6(-1/3) \leq 6(1/6x)$ [por (ii)]
 $-2 \leq x$
21. $-7 < x-2 < 1$
 $-7+2 < x-2+2 < 1+2$ [por (i)]
 $-5 < x < 3$
23. $4 \leq 1/2x - 1/2 < 5$
 $4+1/3 \leq 1/2x - 1/3+1/3 < 5+1/3$ [por (i)]
 $13/3 \leq 1/2x < 16/3$
 $2(13/3) \leq 2(1/2x) < 2(16/3)$ [por (ii)]
 $26/3 \leq x < 32/3$
25. $0 < 1/2(8-4x) < 6$
 $0 < 4-2x < 6$ [por (i)]
 $-4 < 4-4-2x < 6-4$
 $-4 < -2x < 2$
 $(-1/2)(-4) > (-1/2)(-2x) > (-1/2)(2)$ [por (iii)]
 $-1 < x < 2$
27. $(-\infty, -2/3)$ 
29. $(-\infty, 9]$ 
31. $(-\infty, \frac{\pi+8}{3})$ 
33. $(3/5, \infty)$ 
35. $(-2, 3]$ 
37. $(-1/4, 1/8)$ 
39. $(\frac{\sqrt{2}}{5}, \frac{7}{5})$ 
41. $(\infty, -3/2]$ 
43. $x \geq 72\%$
45. Con el descuento, la jarra más grande es más económica si cuesta menos de US\$5.30.

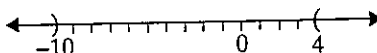
47. 98.6°F

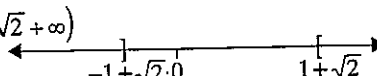
49. Para los números reales a, b y c , si $a \geq b$ entonces $a + b \geq b + c$.50. Si $a < b$, entonces $b - a$ es positivo. Si c es positivo, entonces $(b - a)c$ es positivo pero $(b - a)c = ba - ac$ y por tanto, $ac < bc$.

EJERCICIO 2.7 (página 108)

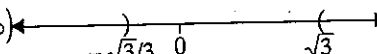
1. $(-\infty, -6] \cup [6, \infty)$ 

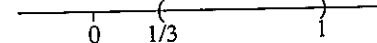
3. $[-5, 13]$ 

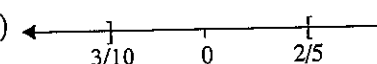
5. $(-\infty, 10) \cup (4, \infty)$ 

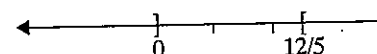
7. $(-\infty, -1 + \sqrt{2}] \cup [1 + \sqrt{2}, \infty)$ 

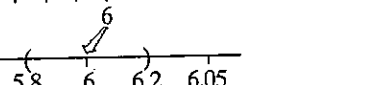
9. No tiene solución.

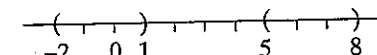
11. $(-\infty, -\sqrt{3}/3) \cup (\sqrt{3}/3, \infty)$ 

13. $(1/3, 1)$ 

15. $(-\infty, 3/10] \cup [2/5, \infty)$ 

17. $(-\infty, 0] \cup [12/5, \infty)$ 

19. $(5.8, 6.2)$ 

21. $(-\infty, 13) \cup (1, \infty)$ 

23. $|x - (-2)| \geq 1; (-\infty, -5] \cup [1, \infty)$

25. $|x - 3.5| < 1/2; (3, 4)$

27. $|x - \sqrt{3}| \leq 2/3; (\sqrt{3} - 2/3, \sqrt{3} + 2/3)$

29. $|x - 7| \leq 4; [3, 11]$

31. $|5x + 3 - 20 - 3| < \epsilon$

33. $|-4x + 1 + 7| < \epsilon$

$|5x - 20| < \epsilon$

$|-4x + 8| < \epsilon$

$|5(x - 4)| < \epsilon$

$|-4(x - 2)| < \epsilon$

$|5||x - 4| < \epsilon$

$|-4||x - 2| < \epsilon$

$5|x - 4| < \epsilon$

$4|x - 2| < \epsilon$

$|x - 4| < \epsilon/5$

$|x - 2| < \epsilon/4$

35. $|x - m| < (b - a)/2$

37. $|x + 1| < 4$

$|x - (a + b)/2| < (b - a)/2$

$|(2x - a - b)/2| < (b - a)/2$

$(a - b)/2 < (2x - a - b)/2 < (b - a)/2$

$a - b < 2x - a - b < b - a$

$2a < 2x < 2b$

$a < x < b$

39. $(15.95, 16.05)$

41. 16.7 y 16.45 onzas respectivamente.

EJERCICIO 2.8 (páginas 112-114)

1. $(-\infty, -3) \cup (5, \infty)$

3. $[-2/3, 1]$

5. $(-\infty, 0] \cup [5, \infty)$

7. $(-3, 3)$

9. $\emptyset$

11. $(-5, 5)$

13. $[-2\sqrt{3}, 2\sqrt{3}]$

15. $\{3\}$

17. $(-\infty, -3) \cup [2/3, \infty)$

19. $(-\infty, -4) \cup [1/3, \infty)$

21. $(-\infty, 1/3) \cup (1, \infty)$

23. $(-\infty, -5/2) \cup [-8/7, \infty)$

25. $(-\infty, -8)$

27. $\emptyset$

29. $(-4, 4)$

31. $(-\infty, -2\sqrt{2}] \cup (1/2, 2\sqrt{2})$

33. $(-3, -2) \cup (-1, \infty)$

35. $[-3, 2/3] \cup [3, \infty)$

37. $(-\infty, -5)$

39. $(-\infty, -5) \cup (-5, 3) \cup (-3, 4) \cup (4, \infty)$

41. $\left(\frac{9 - \sqrt{21}}{2}, \frac{9 + \sqrt{21}}{2}\right)$

43. $\left(-\infty, \frac{5 - \sqrt{13}}{2}\right] \cup \left[\frac{5 + \sqrt{13}}{2}, \infty\right)$

45. $0 < x < 1; x < 0$ ó $x > 1$

47. No, $x \leq 2$ también es posible.

49. El ancho debe ser mayor que 7 m.

51. $R > \frac{21}{4}$ ohmios

53. 9 lados

EJERCICIO DE REPASO (páginas 114-117)

1. +5

3. -3

5. +1

7. -1, 3/2

9. -4, 3/2

11. 4/3

13. -2/5

15. $\frac{4 \pm 2\sqrt{6}i}{5}$

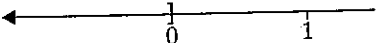
17. $3, \frac{-3 \pm \sqrt{27}i}{2}$

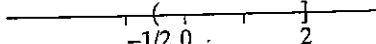
19. $\pm \sqrt{-1 + \frac{\sqrt{5}}{2}}; \pm \sqrt{1 + \frac{\sqrt{5}i}{2}}$

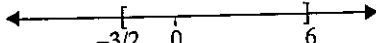
21. 1

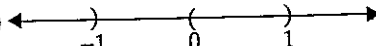
23. -4, 2

25. 1

27. $(-\infty, 1]$ 

29. $(-1/2, 2)$ 

31. $[-3/2, 6]$ 

33. $(-\infty, -1) \cup (0, 1)$ 

35. $C = \frac{A - 2ab}{2b + 2a}$

37. $r = \sqrt{3v/4\pi}$

39. $x = \frac{a}{b} \sqrt{b^2 - y^2}$

41. $10 - 2i$

43. $-16 + 30i$

45. $1/5 + i/10$

47. $14/25 - 23i/25$

49. $x = 16/3, y = 4$

51. $x = -3$ y $y = -1$

53. 15 y 20

55. 88

57. 25 y 30 mph

59. 84

61. 50 mph

63. 5m

65. (a) $2 - \sqrt{3} < t < 2 + \sqrt{3}$ en segundos.

(b) Tocar el suelo después de los 5 segundos.

67. 3.5 lt de agua

69. 5.25 y 26.25 años.

71. 4 años

73. (a) $96\pi \approx 302 \text{ pulg}^3$; (b) 784 pulg^3 ; (c) 6; (d) 46 pulg^3

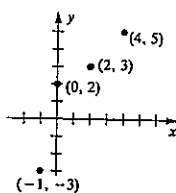
 75. (a) 35.5 min; (b) $t = \frac{c(L+5)}{88Tv}$; (c) $N = \frac{c(L+s)}{88Nv}$

 77. (a) $\rho_i \left[\frac{d_b^3 \rho_b}{6} + \frac{d_i^2 h_i \rho_i}{4} \right]$ (b) $\rho_i \left[\frac{d_b^3}{6} + \frac{d_i^2 h_i}{4} \right] \rho_w$ (c) 4.46 m

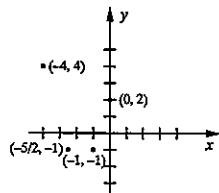
CAPITULO 3

EJERCICIO 3.1 (páginas 126-127)

1.



3.



5. IV

7. I

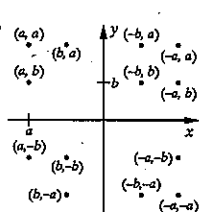
9. III

11. I

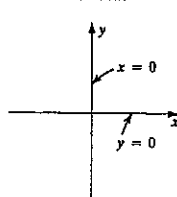
13. III

15. II

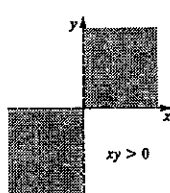
17.



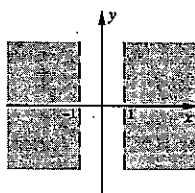
19.



21.



23.



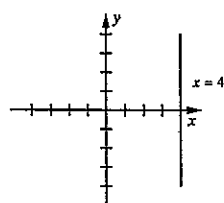
25. Simetría con respecto al origen.

27. Simetría con respecto al origen.

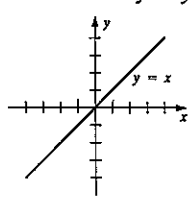
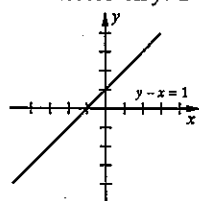
29. Simetría con respecto al eje x.

31. Simetría con respecto al origen.

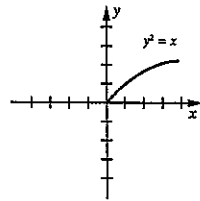
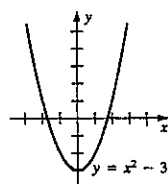
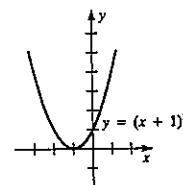
33. Intersecto en x: 4



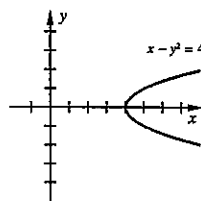
35. Intersecto en x y en y: 0


 37. Intersecto en x: -1
Intersecto en y: 1


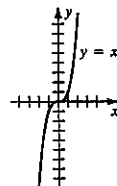
39. Intersecto en x y en y: 0


 41. Intersectos en x: $\pm\sqrt{3}$
Intersecto en y: -3

 43. Intersectos en x: -1
Intersecto en y: 1


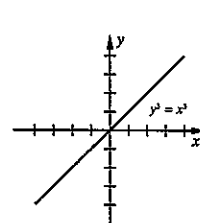
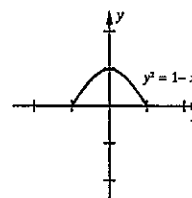
45. Intersecto en x: 4



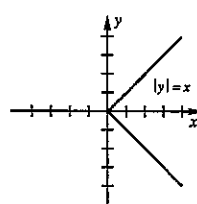
47. Intersectos en x y en y:



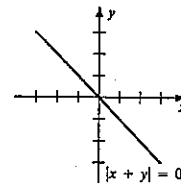
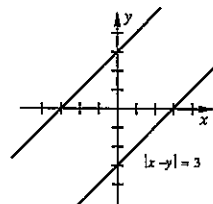
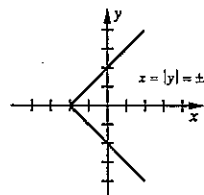
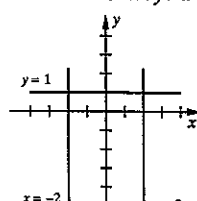
49. Intersectos en x y en y: 0


 51. Intersectos en x: ± 1
Intersecto en y: 1


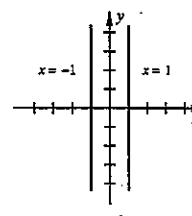
53. Intersectos en x y en y: 0



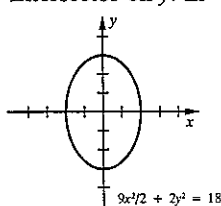
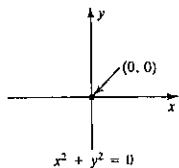
55. Intersectos en x y en y:


 57. Intersectos en x: ± 3
Intersectos en y: ± 3

 59. Intersectos en x: -2
Intersectos en y: ± 2

 61. Intersectos en x: ± 2
Intersecto en y: 1


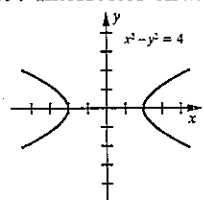
63.



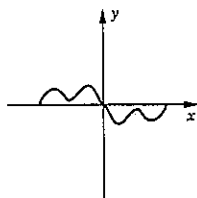
65. Intersectos en x y en y : 0 67. Intersectos en x : ± 2
Intersectos en y : ± 3



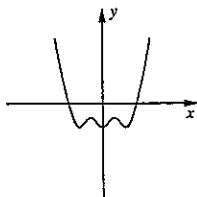
69. Intersectos en x : ± 2



71.

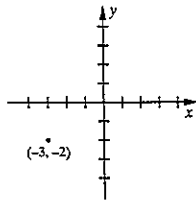
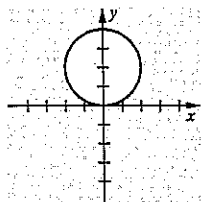
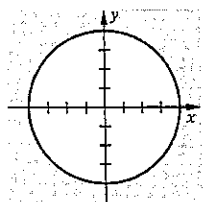


73.



EJERCICIO 3.2 (páginas 133-134)

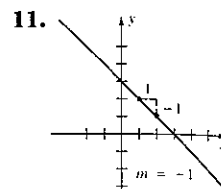
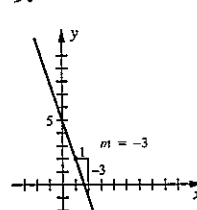
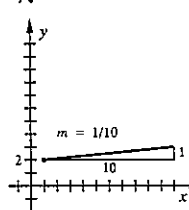
1. 5 3. 5 5. $\frac{\sqrt{53}}{2}$ 7. Triángulo rectángulo
9. Triángulo rectángulo 11. Triángulo isósceles
13. (a) $2x + y - 5 = 0$ (b) Los puntos (x, y) se hallan en la bisectriz perpendicular del segmento de recta que une a A y B .
15. $(1, 5/2)$ 17. $(-9/2, 5/2)$ 19. $(3a, 9b/2)$ 21. $(-11/2, -1)$
23. $(-7, -10)$ 25. $\frac{\sqrt{101}}{2}$
27. Punto medio de AD es: $(9/2, 3)$ y punto medio de BC es: $(9/2, 3)$, por tanto las diagonales se bisecan entre sí.
29. Centro $(-3, 5)$, $r = 5$ 31. Centro $(3/2, 1/2)$, $r = \frac{\sqrt{5}}{2}$
33. Centro $(0, -4)$, $r = 4$ 35. Centro $(8, -3/2)$, $r = \frac{\sqrt{13}}{2}$
37. Centro $(-1, -3)$, $r = \sqrt{12}$
39. Al completar el cuadrado, resulta $(x+1)^2 + y^2 = -9$. Como la suma de los cuadrados no puede ser negativa, esta ecuación no tiene gráfica.
41. $x^2 + y^2 = 1$ 43. $x^2 + (y-3)^2 = 3$ 45. $(x-1) + (y-6) = 8$
47. $x^2 + y^2 = 5$ 49. $(x-5)^2 + (y-6)^2 = 36$
51. 53. 55.



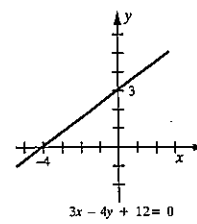
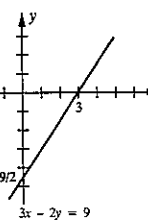
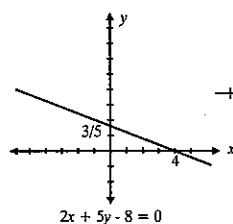
57. Por Des Moines

EJERCICIO 3.3 (páginas 140-142)

1. $-7/2$ 3. 1 5. 1
7. 9.



13. $y - 3x + 4 = 0$ 15. $y - 4x + 16 = 0$ 17. $4y - x - 7 = 0$
19. $y = 1$ 21. $y + x + 3 = 0$ 23. $2x + 3y + 3 = 0$
25. $2x - 3y - 6 = 0$ 27. $y = mx$ 29. $2y - 7x - 14 = 0$
31. $m = 3$, $b = 5/4$ 33. $m = 3$, $b = 0$ 35. $m = 6$, $b = 4$
37. 39. 41.

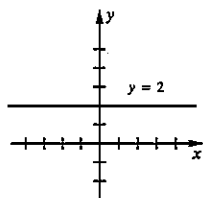
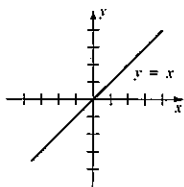
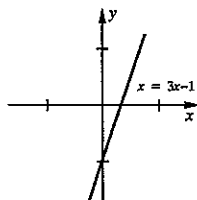
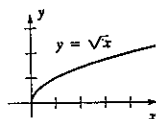
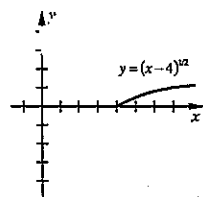
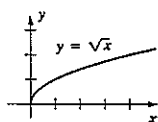
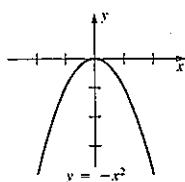
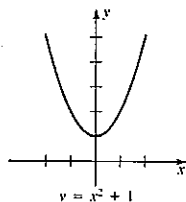
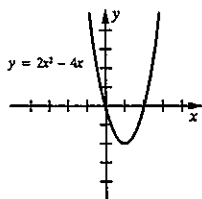
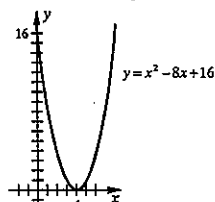
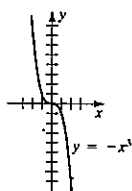
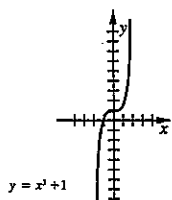
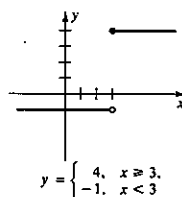
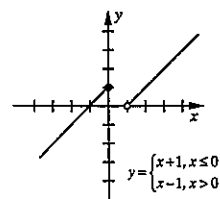
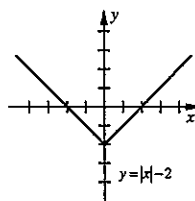
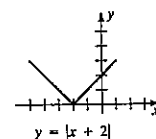


43. $3y + x - 10 = 0$ 45. $2y - 3x - 16 = 0$ 47. $x + 3y - 7 = 0$
49. $y + x - 3 = 0$
51. (a) y (e) son paralelas; (a) y (f) son perpendiculares; (b) y (c) son paralelas; (d) es perpendicular a (b) y a (c); (e) y (f) son perpendiculares.
53. (a) y (d) son perpendiculares; (b) y (c) son perpendiculares; (e) y (f) son perpendiculares.
55. $-10/9$ 59. 2.5°F

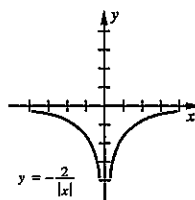
EJERCICIO 3.4 (páginas 149-151)

1. No es función. 3. Una función. 5. Una función.
7. -2 ; -1 ; 0 ; 2 9. 1 ; 7 ; $\sqrt{3/2}$, $\sqrt{1/2}$ 11. 0 ; $3\sqrt{2}$, $-3\sqrt{2}$; -2
13. $a^4 - 3a^6$, $-3a^3 + 10a^2 - 11a + 4$, $-3a^3 - 8a^2 - 7a - 2$, $\frac{b^3 - 3b^2}{b^2b^3}$
17. 0 ; 3 ; $2 + 2\sqrt{2}$; 8 19. $2x + h$ 15. 6 ; 0
23. $\frac{3}{(x+2)(x+2)}$ 25. $[-2/3, \infty)$ 21. $3x^2 + 3xh + h^2$
29. $(-\infty, -2) \cup (2, \infty)$ 31. $\{x | x \geq -3 \text{ y } x \neq 0\}$
33. $(-1, 2]$ 35. El dominio y el rango son todos los números reales.
37. El dominio y el rango son todos los números reales.
39. $[1/3, \infty)$; $[-1, \infty)$ 41. $(-\infty, 16/3]$ 43. $x = 12$
45. 1 ; 2 47. $\frac{\sqrt{3}}{4}s^2$ 49. $A = \pi(d/2)^2$
51. $A^{3/2}$ 53. $V = x(3 - 2x)(4 - 2x)$
55. $x^2 + \frac{80,000}{x}$ 57. $F = 2x + \frac{12,000}{x}$
59. $A = 15x - \frac{2 + \pi x^2}{8}$ 61. $d = \sqrt{2500t^2 + (4 - 30t)^2}$
63. $A = r - \pi r^2$

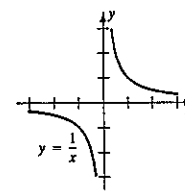
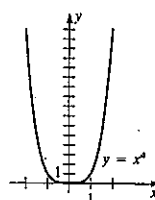
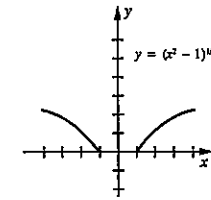
EJERCICIO 3.5 (páginas 158-159)

 1. Intersecto en $y: 2$

 3. Intersectos en x y en $y: 0$

 5. Intersecto en $x: 1/3$
Intersecto en $y: -1$

 7. Intersectos en x y en $y: 0$

 9. Intersecto en $x: 4$

 11. Intersectos en x y en $y: 0$

 13. Intersectos en x y en $y: 0$

 15. Intersecto en $y: 1$

 17. Intersecto en $x: 0, 4$
Intersecto en $y: 0$

 19. Intersecto en $x: 4$
Intersecto en $y: 16$

 21. Intersectos en x y en $y: 0$

 23. Intersecto en $x: -1$
Intersecto en $y: 1$

 25. Intersecto en $y: -1$

 27. Intersecto en $y: 1$

 29. Intersecto en $x: \pm 2$
Intersectos en $y: -2$

 31. Intersecto en $x: -2$
Intersecto en $y: 2$


33. Sin intersectos



35. Sin intersectos


 37. Intersectos en x y en $y: 0$

 39. Intersecto en $x: \pm 1$

 41. Intersectos en $x: -5, 7$; intersecto en $y: 3, 5$.

 43. Intersectos en $x: \pm\sqrt{2}$; intersecto en $y: \sqrt{2}$.

 45. Intersecto en $x: 3/2$; sin intersecto en y .

47. No es función.

49. No es función.

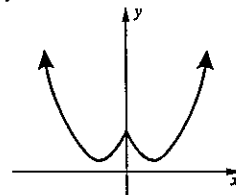
51. No es función.

53. No es función.

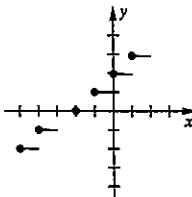
 55. $[1, 9]; [1, 6]$

 57. $[-3, 3]; [-3, 0]$

59.

 61. $-3, -2, -2, 0, 3, 2, 1$


63.



65. $V = 25,000(1 - x/20)$, $0 \leq x \leq 20$; US\$12,500

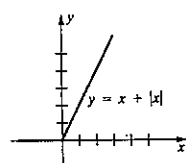
67. US\$500,000; 20 años; 30 años; 40 años.

69. $T_K = 273 + T_C$; -273°C ; 0459.4°F .

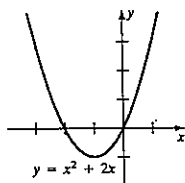
EJERCICIO 3.6 (páginas 166-167)

1. $(f+g)(x) = 4x^2 - 2x + 3$
dominio: todos los números reales;
 $(fg)(x) = 3x^4 - 2x^3 + x^2 + 2x - 4$
dominio: todos los números reales.
3. $(f+g)(x) = 6x$
dominio: todos los números reales;
 $(f)(x) = 9x^2 - 1/(x-1)$
dominio: $\{x | x \neq +1\}$
5. $(f+g)(x) = x^2 + x - 12$
dominio: todos los números reales; $f/g(x) = (x^2 - 9)/(x - 3)$
dominio: $\{x/x \neq 3\}$
7. $(f+g)(x) = \sqrt{1-x} + \sqrt{x+2}$
dominio: $[-2, 1]$
 $(fg)(x) = \sqrt{(1-x)(x+2)}$
dominio: $[-2, 1]$

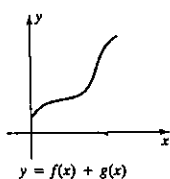
9.



11.

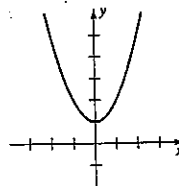


13.

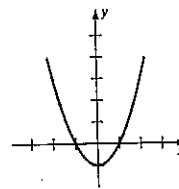


15. $(f \circ g)(x) = x$
 $(g \circ f)(x) = |x|$
17. $(f \circ g)(x) = \frac{2}{x^2 - 2}$
 $(g \circ f)(x) = \frac{3 - x^2 + 2x}{x^2 - 2x + 1}$
19. $(f \circ g)(x) = x$
 $(g \circ f)(x) = x$
21. $(f \circ g)(x) = x^2 - 1/x$
 $(g \circ f)(x) = \frac{x^2}{x^3 - 1}$
23. $(f \circ g)(x) = x - \sqrt{x+1} - 1$
 $(g \circ f)(x) = x - 1 - \sqrt{x}$
25. $[-1, \infty)$ 27. $\{x | x \neq 6\}$ 29. $\{-\infty, -2\} \cup \{0, \infty\}$
31. $(f \circ f)(x) = 36x - 14$
 $(f \circ (1/f))(x) = \frac{-12x + 10}{6x - 2}$
33. $(f \circ f)(x) = x^4$
 $(f \circ (1/f))(x) = 1/x^4$
35. $F(x) = (f \circ g)(x)$, donde $f(x) = 4x + 1$ $g(x) = x^2$
37. $F(x) = (f \circ g)(x)$, donde $f(x) = x^2 + 4\sqrt{x}$, $g(x) = x - 3$
39. $(f \circ g \circ h)(x) = x^2 + x$ 41. $(f \circ g \circ h) = |x - 1|$

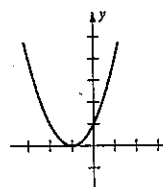
43. (a)



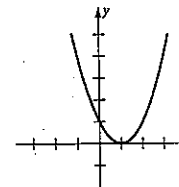
(b)



(c)



(d)

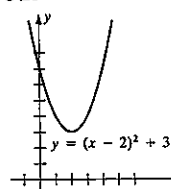


45. $y = -|x+2|$

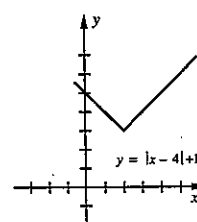
47. $y = -x^2 + 5$

49. $y = (x+3)^2 - 4$

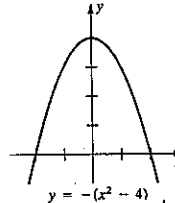
51.



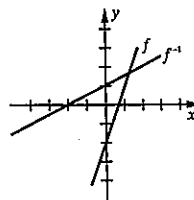
53.



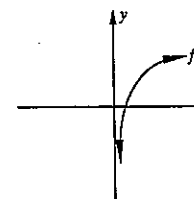
55.

**EJERCICIO 3.7 (páginas 172-173)**

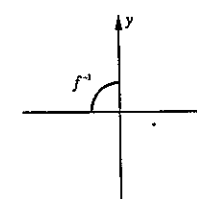
1. Uno a uno; $f^{-1}(x) = x/3$ 3. Uno a uno; $f^{-1}(x) = x^{1/3}$
5. No es uno a uno. 7. No es uno a uno.
9. Uno a uno; $f^{-1}(x) = 3 + 1/x$ 11. $f^{-1}(x) = 8/3 - x/3$
13. $f^{-1}(x) = 3x/(2-x)$ 15. $f^{-1}(x) = 1/(x-4)$
17. $f^{-1}(x) = \sqrt[3]{x+1}$ 19. $f^{-1}(x) = x^2, x \geq 0$
21. Demuestra que: $f(g(x)) = x$ y $g(f(x)) = x$
23. Demuestra que: $f(g(x)) = x$ y $g(f(x)) = x$
25. Dominio $[0, \infty]$; rango $[3, \infty]$
27. (37, 5) 29. (6, 3)
31. 33.



35.



37.



39. Si $(x_1) = f(x_2)$, entonces

$$-2x_1 + 3 = -2x_2 + 3$$

$$2x_1 = 2x_2$$

$$x_1 = x_2$$

 41. Si $f(x_1) = f(x_2)$, entonces

$$3x_1 - 5 = 3x_2 - 5$$

$$3x_1 = 3x_2$$

$$x_1 = x_2$$

 43. Si $f(x_1) = f(x_2)$, entonces

$$1/x_1 = 1/x_2$$

$$x_1 = x_2$$

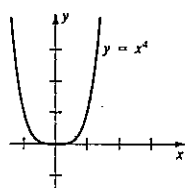
 45. $f(f(x)) = f(-x) = -(-x) = x$

$$47. f(f(x)) = \frac{1}{(1/x)} = x$$

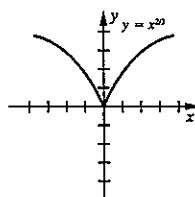
$$49. F^{-1}(x) = 3/2 - \sqrt{x}/2, [0, \infty]$$

EJERCICIO 3.8 (páginas 177-178)

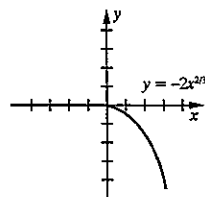
1.



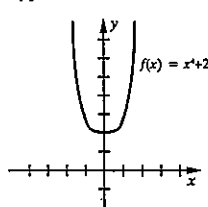
3.



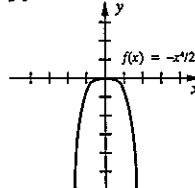
5.



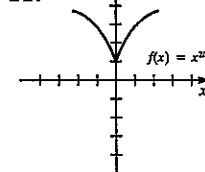
7.



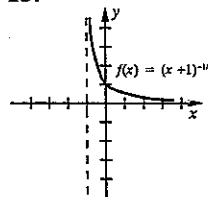
9.



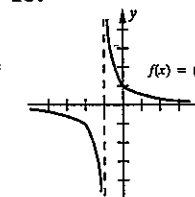
11.



13.



15.



17. (a) 62.30 años (b) 29.3 años 19. 18 21. 2

 23. $s = 6t^2$; 216 pies 54 pies 25. 207 lb

 27. $f = K \frac{mM}{r^2}$, la fuerza se aumenta por un múltiplo de 4.

 29. $P = k \frac{T}{V}$, aproximadamente 3,645.7 pies cúbicos.

 31. Aproximadamente 2.30 m². 33. $I = \sqrt{Q/KRT}$
EJERCICIO DE REPASO (páginas 179-181)

1. Cuarto 3. (-3, -1)

 5. Centro (-3, -1) $r = 2$

7. Recta vertical 9. F

11. (1, 1)

 13. $(-\infty, 3/2)$

15. Uno a uno

17. V

19. 6

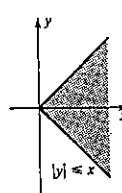
21. Triángulo isósceles

 23. $2y - 3x + 11 = 0$ 25. $15x + 4y - 32 = 0$

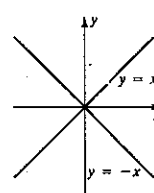
27. 3, -5

 29. $3h + 11$

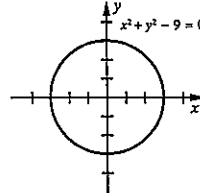
31.



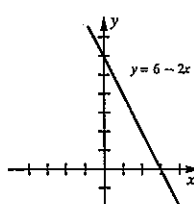
33.



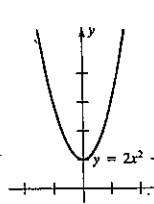
35.



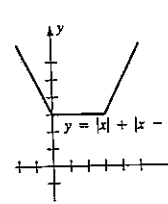
37.



39.



41.


 43. $8/x^6$; $2/x^6$; x^9 ; $x^4/2$; $x^6/8$ 45. $f^{-1}(x) = (3x+3)/(x-1)$

 47. $r = \sqrt{A/\pi}$ 49. $A = 4x\sqrt{9-x^2}$

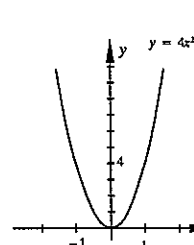
51. (a) 0; (b) 0; (c) 1; (d) 1; (e) 1; (f) 0

 53. (a) $[0, L]$; (b) 3,146 m; (c) aproximadamente 337,500 m

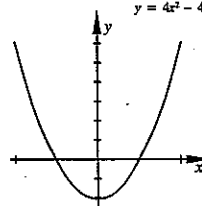
 55. 6,400 libras 57. 5.08×10^{-7} m.

CAPITULO 4
EJERCICIO 4.1 (páginas 191-193)

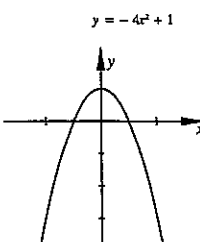
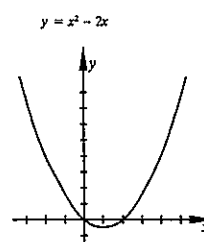
1.



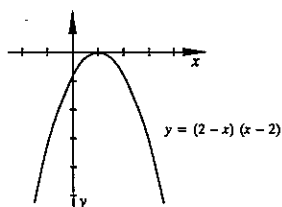
3.



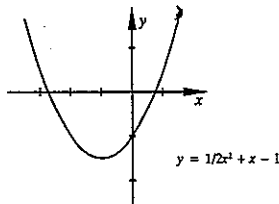
5.


 7. vértice (1, -1)
intersección (0, 0), (2, 0)


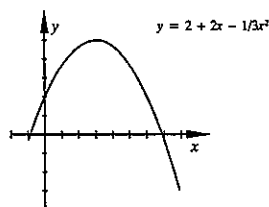
9. vértice (2, 0)
intersectos (0, -4), (2, 0)



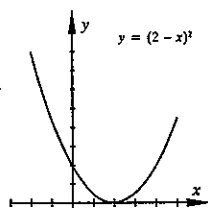
11. vértice $(-1, -3/2)$
intersectos $(-1 - \sqrt{3}, 0)$; $(-1 + \sqrt{3}, 0)$; $(0, -1)$



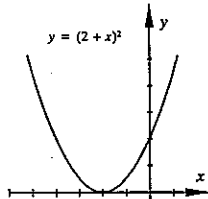
13. vértice (3, 5)
intersectos $(3 - \sqrt{15}, 0)$; $(3 + \sqrt{15}, 0)$



15. vértice (2, 0)
intersectos (0, 4); (2, 0)



17. vértice (-2, 0)
intersectos (-2, 0); (0, 4)



19. $[4/5, +\infty)$ creciente; $(-\infty, 4/5]$ decreciente
21. $[-\infty, -1]$ creciente; $[-1, +\infty)$ decreciente
23. (a) F (b) V (c) V (d) F (e) V (f) V
25. 11/2 27. 4y 29. 10, 10
31. 2 por 3
33. $(9/2, 7/2)$ y $(9/2, 63/4)$; $d = 49/9$
37. $r = 12/(4 + \pi)$
39. 700 artículos, 122,500 ingreso máximo.
41. precio US\$100, cantidad de cajas 60
43. (a) P/2 (b) R = 0.000011 (c) martes - 72; miércoles - 87; jueves - 105; viernes - 127; sábado - 153; total - 896

EJERCICIO 4.2 (página 198)

1. $x^2 - 7x + 4 = (x + 4)(x - 11) + 48$
3. $7x^3 - 8x^2 + 6x + 1 = (x^2 - x + 2)(7x - 1) + (-9x + 3)$
5. $3x^3 - 6x^2 + 8x - 1 = (x + 1)^2 3x + (5x - 1)$
7. $27x^4 - 36x^2 + x + 9 = (3x^2 + x + 2)(9x^2 - 3x - 17) + (24x + 43)$
9. $3x^5 - 13x^3 + \bar{x} - 9 = (x^2 - 2x + 2)(3x^3 + 6x^2 - 7x - 26) + (-37x + 50)$
11. $5x^6 - 4x^3 + 2x^2 + x - 5 = (x - 1)(5x^5 + 5x^4 + 5x^3 + x^2 + 3x + 4) + (-1)$
13. $q(x) = 5x + 12; r = 38$

15. $q(x) = 2x^2 + 2x + 9; r = 0$

17. $q(x) = x^2 + 1/2x - 1/4; r = 31/8$

19. $q(x) = 7x^2 + 13/4x - 205/16; r = 333/64$

21. $q(x) = x^3 + 16x^2 + 64x + 256; r = 1088$

23. $q(x) = 8x^4 + 2x^3 + 1/2x^2 + 23/8x + 105/23; r = 565/92$

25. $q(x) = 3x^2 + 1; r = 1$

27. $q(x) = 2x^2 + (3 + 2\sqrt{5})x + 3\sqrt{5}; r = 30$

29. $k = -4$

31. $k = 1/6$

EJERCICIO 4.3 (página 201)

1. 37 3. 0 5. 0 7. -8 9. -90
11. 4 13. 0 15. 14,335 17. Sí 19. No
21. Sí 23. No 25. Sí 27. $(-x + 2)(x - 3)$
29. $4\left(x + \frac{3 + \sqrt{41}}{8}\right)\left(x + \frac{3 - \sqrt{41}}{8}\right)$
31. $(2x - 3)(x - 1)$
33. $f(x) = A(x - 1)(x - 2)(x + 2), A \in \mathbb{R}$
 $g(x) = 2(x - 1)(x - 2)(x + 2)$
35. $(2x - 1)(2x + 1)(x + 1)$ 37. $k = -4$ 39. $k = 25/9$
41. $c = 3 \vee c = 2$ 43. 15

EJERCICIO 4.4 (páginas 210-211)

1. Positiva $\rightarrow 1$ Negativa $\rightarrow 1$
3. Positiva $\rightarrow 3 \vee 0$ Negativa $\rightarrow 0$
5. Positiva $\rightarrow 0$ Negativa $\rightarrow 3 \vee 1$
7. Positiva $\rightarrow 2 \vee 0$ Negativa $\rightarrow 2 \vee 0$
9. Positiva $\rightarrow 3 \vee 1$ Negativa $\rightarrow 2 \vee 0$
11. 1/3 13. -1 15. 1/2 17. 2 19. 0,1
21. 0, 1, -1, -2, -3 23. 0, 1/3, 1/2, -2 25. -0.2
27. -1, $\sqrt{3}, -\sqrt{3}$ 29. $-1/3, \sqrt{2}, -\sqrt{2}$
31. $\frac{\sqrt{3+2\sqrt{2}}}{3}, \frac{\sqrt{3-2\sqrt{2}}}{3}, \frac{-\sqrt{3+2\sqrt{2}}}{3}, \frac{-\sqrt{3-2\sqrt{2}}}{3}$
33. $-1/8, \sqrt{2}, -\sqrt{2}$ 35. $-3/4, -1/4, \sqrt{5}, -\sqrt{5}$
37. $6, -1, \sqrt{2}, -\sqrt{2}$ 39. $-1/3, \sqrt{2}/2, -\sqrt{2}/2$
41. $1, -1, \sqrt{\frac{17-1}{2}}, -\sqrt{\frac{17-1}{2}}$ 43. No tiene
45. $1, 1/2, -1/2$ 47. 3 49. $6y - 4$ 51. 2, -2
53. 5, -3 55. 2, -6 57. 0, -1
59. No. Por no ser número entero 61. -16 63. 0, 2
65. $f(x) = 1/6(2x - 1)(x - 3)(x + 2)$ 69. N veces
71. Sí; no

EJERCICIO 4.5 (páginas 214-215)

1. $-1/3 + \frac{\sqrt{2}i}{3}, -1/3 - \frac{\sqrt{2}i}{3}; f(x) = (3x + 1 + \sqrt{2}i)\left(x + 1/3 - \frac{\sqrt{2}i}{3}\right)$
3. $1, 3/2i, -3/2i; f(x) = (2x + 3i)(2x - 3i)(x - 1)$
5. $1/2, 1/2i, -1/2i; f(x) = (2x + i)(2x - i)(x - 1/2)$