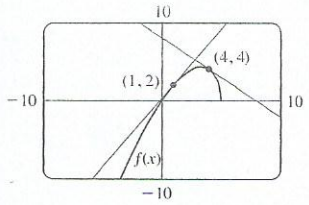
57. $y = 2\sqrt{3}x + 1 - \pi\sqrt{3}/3$ **59.** $y = 2x + 1$

61. $y = -x + 2;\ y = x + 2$

63. (a) $\dfrac{10 - 3x}{2\sqrt{5 - x}}$ (b) $y = \frac{7}{4}x + \frac{1}{4},\ y = -x + 8$

(c)



65. $(\pi/4, \sqrt{2}), (5\pi/4, -\sqrt{2})$ **69.** (a)2 (b)44

71. $2xg(x) + x^2g'(x)$ **73.** $2g(x)g'(x)$ **75.** $g'(e^x)e^x$

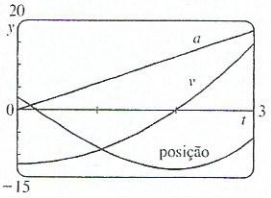
77. $g'(x)/g(x)$ **79.** $\dfrac{f'(x)[g(x)]^2 + g'(x)[f(x)]^2}{[f(x) + g(x)]^2}$

81. $f'(g(\operatorname{sen} 4x))g'(\operatorname{sen} 4x)(\cos 4x)(4)$ **83.** $(-3, 0)$

85. $y = -\frac{2}{3}x^2 + \frac{14}{3}x$

87. $v(t) = -Ae^{-ct}[c\cos(\omega t + \delta) + \omega \operatorname{sen}(\omega t + \delta)]$,
$a(t) = Ae^{-ct}[(c^2 - \omega^2)\cos(\omega t + \delta) + 2c\omega \operatorname{sen}(\omega t + \delta)]$

89. (a) $v(t) = 3t^2 - 12;\ a(t) = 6t$ (b) $t > 2;\ 0 \leq t < 2$
(c) 23 (d)



(e) $t > 2;\ 0 < t < 2$

91. 4 kg/m **93.** (a) $200(3{,}24)^t$ (b) $\approx 22\,040$
(c) $\approx 25\,910$ bactérias/h (d) $(\ln 50)/(\ln 3{,}24) \approx 3{,}33$ h

95. (a) C_0e^{-kt} (b) ≈ 100 h **97.** $\frac{4}{3}$ cm^2/min

99. $117/\sqrt{666} \approx 4{,}53$ m/s **101.** 400 m/h

103. (a) $L(x) = 1 + x;\ \sqrt[3]{1 + 3x} \approx 1 + x;\ \sqrt[3]{1{,}03} \approx 1{,}01$
(b) $-0{,}23 < x < 0{,}40$

105. $12 + \frac{3}{2}\pi \approx 16{,}7$ cm^2 **107.** $\frac{1}{32}$ **109.** $\frac{1}{4}$ **111.** $\frac{1}{8}x^2$

PROBLEMAS QUENTES ■ PÁGINA 248

1. $(\pm\frac{1}{2}\sqrt{3}, \frac{1}{4})$ **9.** $(0, \frac{5}{4})$

11. (a) $4\pi\sqrt{3}/\sqrt{11}$ rad/s (b) $40\left(\cos\theta + \sqrt{8 + \cos^2\theta}\right)$ cm
(c) $-480\pi \operatorname{sen}\theta\left(1 + \cos\theta/\sqrt{8 + \cos^2\theta}\right)$ cm/s

15. $x_T \in (3, \infty), y_T \in (2, \infty), x_N \in (0, \frac{5}{3}), y_N \in (-\frac{5}{2}, 0)$

17. (b) (i) 53° (ou 127°) (ii) 63° (ou 117°)

19. R se aproxima do ponto médio do raio AO.

21. $-\operatorname{sen} a$ **23.** $2\sqrt{e}$ **27.** $(1, -2), (-1, 0)$

29. $\sqrt{29}/58$ **31.** $2 + \frac{375}{128}\pi \approx 11\,204$ cm^3/min

CAPÍTULO 4

EXERCÍCIOS 4.1 ■ PÁGINA 258

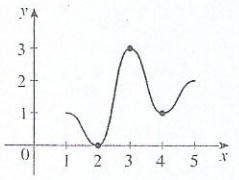
Abreviações: abs., absoluto; loc., local; máx., máximo; mín., mínimo

1. Mínimo absoluto: menor valor da função no domínio todo da função; mínimo local em c: menor valor da função quando x está próximo de c

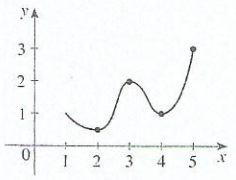
3. Máx. abs. em s, mín. abs. em r, máx. loc. em c, mín. loc. em b e r

5. Máx. abs. $f(4) = 5$, máx. loc. $f(4) = 5$ e $f(6) = 4$, mín. loc. $f(2) = 2$ e $f(5) = 3$

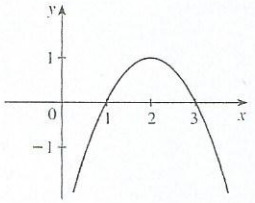
7.



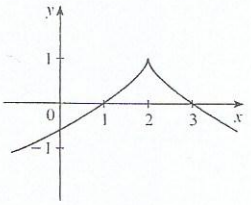
9.



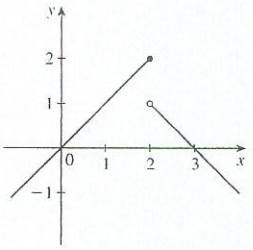
11. (a)



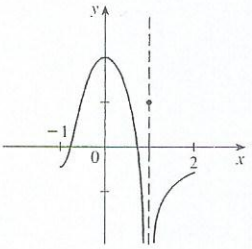
(b)



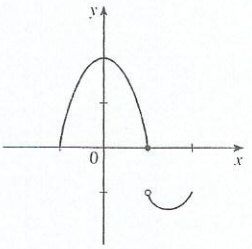
(c)



13. (a)



(b)



15. Máx. abs. $f(1) = 5$ **17.** Nenhum

19. Mín. abs. $f(0) = 0$

21. Máx. abs. $f(-3) = 9$, mín. abs. e loc. $f(0) = 0$

23. Nenhum

25. Máx. abs. $f(0) = 1$ **27.** Máx. abs. $f(3) = 2$

29. $-\frac{2}{5}$ **31.** $-4, 2$ **33.** $0, \frac{1}{2}(-1 \pm \sqrt{5})$ **35.** $0, 2$

37. $0, \frac{4}{9}$ **39.** $0, \frac{8}{7}, 4$ **41.** $n\pi$(n um inteiro) **43.** $0, \frac{2}{3}$

45. 10 **47.** $f(0) = 5, f(2) = -7$