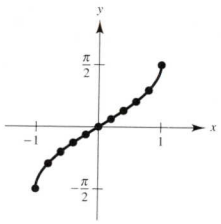
Section 5.6 (page 379)

1. (a)

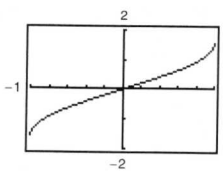
x	-1	-0.8	-0.6	-0.4	-0.2
y	-1.57	-0.93	-0.64	-0.41	-0.20

x	0	0.2	0.4	0.6	0.8	1
y	0	0.20	0.41	0.64	0.93	1.57

(b)



(c)



(d) Intercept: (0, 0);
Symmetry: origin

3. $\left(-\sqrt{2}/2, 3\pi/4\right), (1/2, \pi/3), \left(\sqrt{3}/2, \pi/6\right)$

5. $\pi/6$ **7.** $\pi/3$ **9.** $\pi/6$ **11.** $-\pi/4$ **13.** 2.50

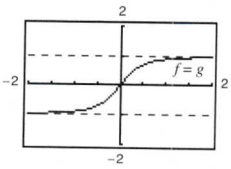
15. $\arccos(1/1.269) \approx 0.66$ **17.** (a) $3/5$ (b) $5/3$

19. (a) $-\sqrt{3}$ (b) $-\frac{13}{5}$ **21.** x **23.** $\sqrt{1-x^2}/x$ **25.** $1/x$

27. $\sqrt{1-4x^2}$ **29.** $\sqrt{x^2-1}/|x|$

31. $\sqrt{x^2-9}/3$ **33.** $\sqrt{x^2+2}/x$

35. (a)



(b) Proof

(c) Horizontal asymptotes: $y = -1, y = 1$

37. $x = \frac{1}{3}\left[\sin\left(\frac{1}{2}\right) + \pi\right] \approx 1.207$ **39.** $x = \frac{1}{3}$

41. (a) and (b) Proofs **43.** $2/\sqrt{2x-x^2}$

45. $-3/\sqrt{4-x^2}$ **47.** $e^x/(1+e^{2x})$

49. $\left(3x - \sqrt{1-9x^2}\arcsin 3x\right)/\left(x^2\sqrt{1-9x^2}\right)$

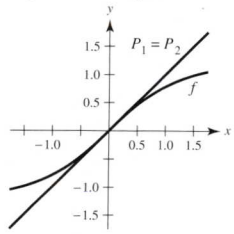
51. $-t/\sqrt{1-t^2}$ **53.** $2\arccos x$ **55.** $1/(1-x^4)$

57. $\arcsin x$ **59.** $x^2/\sqrt{16-x^2}$ **61.** $2/(1+x^2)^2$

63. $y = \frac{1}{3}\left(4\sqrt{3}x - 2\sqrt{3} + \pi\right)$

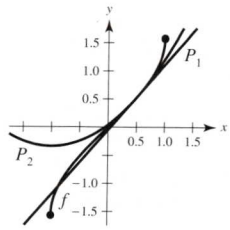
65. $y = \frac{1}{4}x + (\pi - 2)/4$ **67.** $y = (2\pi - 4)x + 4$

69. $P_1(x) = x; P_2(x) = x$



71. $P_1(x) = \frac{\pi}{6} + \frac{2\sqrt{3}}{3}\left(x - \frac{1}{2}\right)$

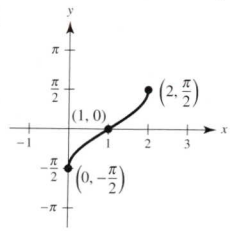
$P_2(x) = \frac{\pi}{6} + \frac{2\sqrt{3}}{3}\left(x - \frac{1}{2}\right) + \frac{2\sqrt{3}}{9}\left(x - \frac{1}{2}\right)^2$



73. Relative maximum: $(1.272, -0.606)$
Relative minimum: $(-1.272, 3.747)$

75. Relative maximum: $(2, 2.214)$

77.

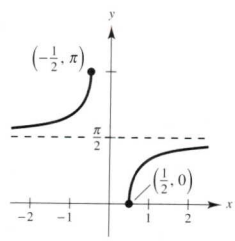


Maximum: $\left(2, \frac{\pi}{2}\right)$

Minimum: $\left(0, -\frac{\pi}{2}\right)$

Point of inflection: $(1, 0)$

79.



Maximum: $\left(-\frac{1}{2}, \pi\right)$

Minimum: $\left(\frac{1}{2}, 0\right)$

Asymptote: $y = \frac{\pi}{2}$

81. $y = -2\pi x/(\pi + 8) + 1 - \pi^2/(2\pi + 16)$

83. $y = -x + \sqrt{2}$

85. If the domains were not restricted, the trigonometric functions would have no inverses because they would not be one-to-one.

87. If $x > 0$, $y = \operatorname{arccot} x = \arctan\frac{1}{x}$; If $x < 0$, $y = \arctan\frac{1}{x} + \pi$.

89. (a) $\arcsin(\arcsin 0.5) \approx 0.551$
$\arcsin(\arcsin 1)$ does not exist.
(b) $\sin(-1) \le x \le \sin(1)$

91. False. The range of arccos is $[0, \pi]$. **93.** True **95.** True

97. (a) $\theta = \operatorname{arccot}(x/5)$
(b) $x = 10$: 16 rad/h; $x = 3$: 58.824 rad/h

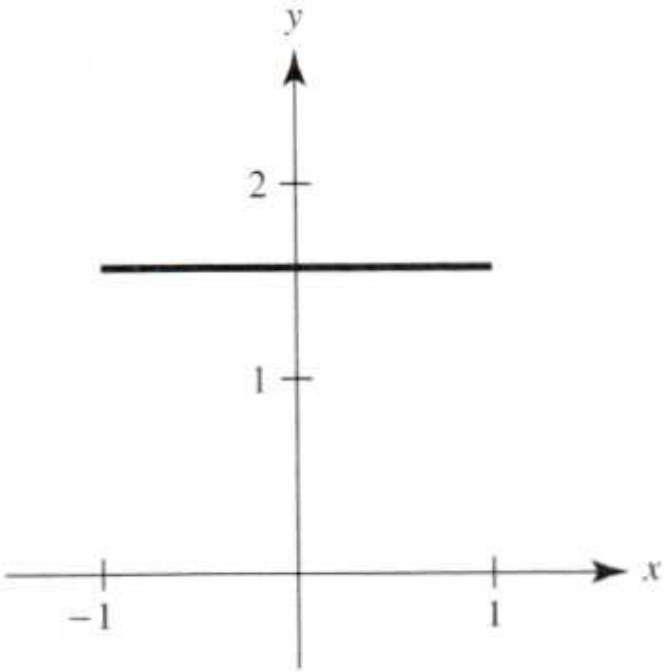
99. (a) $h(t) = -16t^2 + 256$; $t = 4$ sec
(b) $t = 1$: -0.0520 rad/sec; $t = 2$: -0.1116 rad/sec

101. $50\sqrt{2} \approx 70.71$ ft

103. (a) and (b) Proofs

105. $k \leq -1$ or $k \geq 1$

107. (a)

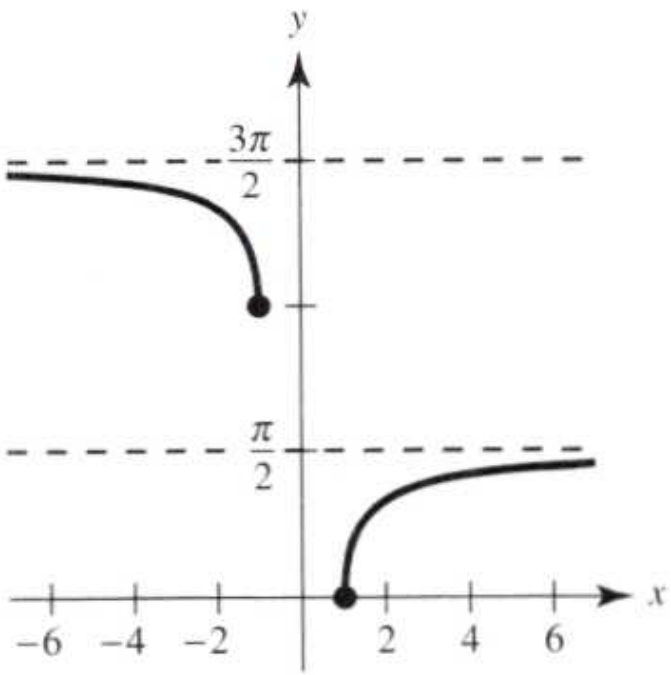


(b) The graph is a horizontal line at $\frac{\pi}{2}$.

(c) Proof

109. $c = 2$

111. (a)



(b) Proof