

Maxima: (0.5236, 1.5); (2.6180, 1.5)

Minimum: (4.7124, -3)

(b) 0.5236, 1.5708, 2.6180, 4.7124

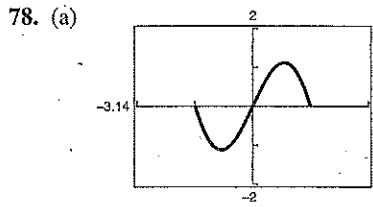
70. 0.739 *1/17, 1/5, 1/2, 5/6, 3/2*

72. (a) All real numbers except $x = 0$

(b) y -axis symmetry; horizontal asymptote at $y = 0$

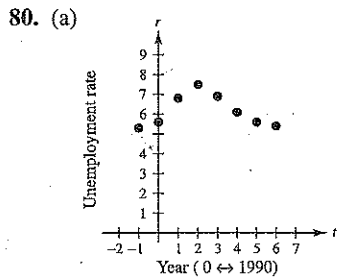
(c) y approaches 1 (d) $\pm\pi, \pm 2\pi$

74. February, March, April 76. $37^\circ, 53^\circ$



$x \approx 0.86, A \approx 1.12$

(b) $0.6 < x < 1.1$



(b) iii

(c) Constant term; 6.34%

(d) Approximately 6 years

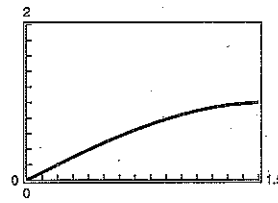
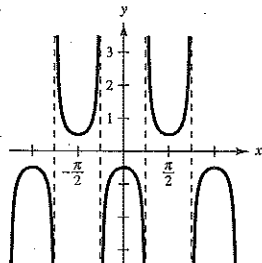
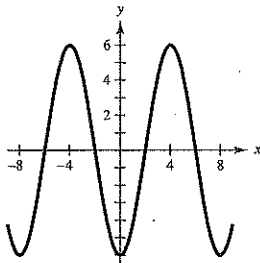
(e) 2001

82. False. Reasons will vary. 84. Answers will vary.

86. 8.482 rad 88. -3.675 rad

90. 14 92. 9.4

94. 96.



Section 5.4 (page 408)

2. (a) $\frac{-\sqrt{6} - \sqrt{2}}{4}$ (b) $\frac{\sqrt{3} + \sqrt{2}}{2}$

4. (a) $\frac{-\sqrt{6} - \sqrt{2}}{4}$ (b) $\frac{-\sqrt{2} - \sqrt{3}}{2}$

6. (a) $-\frac{1}{2}$ (b) $-\frac{3}{2}$ 8. (a) $\frac{1}{2}$ (b) $\frac{1 + \sqrt{3}}{2}$

10. $\sin(15^\circ) = \frac{\sqrt{6} - \sqrt{2}}{4}$

12. $\sin(165^\circ) = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\cos(15^\circ) = \frac{\sqrt{6} + \sqrt{2}}{4}$

$\cos(165^\circ) = \frac{-\sqrt{6} - \sqrt{2}}{4}$

$\tan(15^\circ) = 2 - \sqrt{3}$

$\tan(165^\circ) = -2 + \sqrt{3}$

14. $\sin(285^\circ) = \frac{-\sqrt{2} - \sqrt{6}}{4}$

16. $\sin\left(\frac{17\pi}{12}\right) = \frac{-\sqrt{2} - \sqrt{6}}{4}$

$\cos(285^\circ) = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\cos\left(\frac{17\pi}{12}\right) = \frac{\sqrt{2} - \sqrt{6}}{4}$

$\tan(285^\circ) = -2 - \sqrt{3}$

$\tan\left(\frac{17\pi}{12}\right) = 2 + \sqrt{3}$

18. $\sin\left(-\frac{19\pi}{12}\right) = \frac{\sqrt{6} + \sqrt{2}}{4}$

$\cos\left(-\frac{19\pi}{12}\right) = \frac{\sqrt{6} - \sqrt{2}}{4}$

$\tan\left(-\frac{19\pi}{12}\right) = 2 + \sqrt{3}$

20. $\sin 190^\circ$

22. $\cos 10^\circ$

24. $\tan 80^\circ$

26. $\cos 0.54$

28. $\sin \frac{29\pi}{90}$

30.

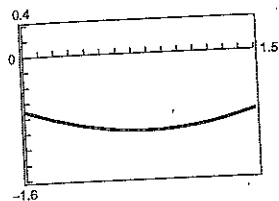
x	0.2	0.4	0.6	0.8
y_1	0.0395	0.1516	0.3188	0.5146
y_2	0.0395	0.1516	0.3188	0.5146

x	1.0	1.2	1.4
y_1	0.7081	0.8687	0.9711
y_2	0.7081	0.8687	0.9711

32.

x	0.2	0.4	0.6	0.8
y_1	-0.8335	-0.9266	-0.9829	-0.9999
y_2	-0.8335	-0.9266	-0.9829	-0.9999

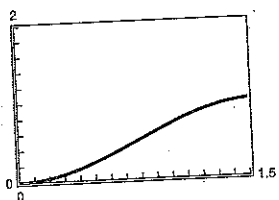
x	1.0	1.2	1.4
y_1	-0.9771	-0.9153	-0.8170
y_2	-0.9771	-0.9153	-0.8170



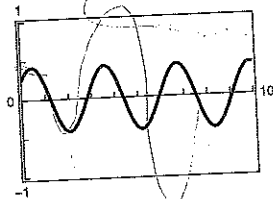
34.

x	0.2	0.4	0.6	0.8
y_1	0.1987	0.3894	0.5646	0.7174
y_2	0.1987	0.3894	0.5646	0.7174

x	1.0	1.2	1.4
y_1	0.8415	0.9320	0.9854
y_2	0.8415	0.9320	0.9854



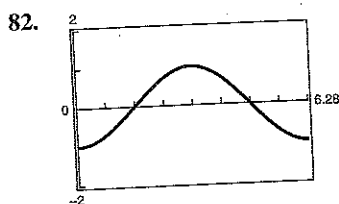
36. $-\frac{16}{65}$ 38. $-\frac{63}{65}$ 40. $\frac{4}{5}$ 42. $-\frac{117}{125}$
 44.-50. Answers will vary. 52. $2x\sqrt{1-x^2}$
 54. $\frac{2x^2 + \sqrt{1-x^2}}{\sqrt{1+4x^2}}$ 56. $\frac{\pi}{3}, \frac{5\pi}{3}$ 58. $\frac{3\pi}{2}$ 60. $\frac{\pi}{6}, \frac{5\pi}{6}$
 62. 0.7854, 3.9270 64. 0, 1.0472, 3.1416, 5.2360
 66. (a)



(b) $y = \frac{5}{12} \sin(2t + 0.6435)$ (c) $\frac{5}{12}$ (d) $\frac{1}{\pi}$

68. False. $\cos(u \pm v) = \cos u \cos v \mp \sin u \sin v$

70. True 72. and 74. Answers will vary.
 76. (a) $5 \sin(2\theta + 0.9273)$ (b) $5 \cos(2\theta - 0.6435)$
 78. (a) $\sqrt{2} \sin\left(2\theta - \frac{\pi}{4}\right)$ (b) $-\sqrt{2} \cos\left(2\theta + \frac{\pi}{4}\right)$
 80. $-\frac{5\sqrt{2}}{2} \sin \theta + \frac{5\sqrt{2}}{2} \cos \theta$



$g(x) = -\cos x$

84. and 86. Answers will vary.
 88. (0, -40), (-5, 0), (8, 0) 90. (-7, 0), (0, 0)
 92. $-\frac{\pi}{3}$ 94. 0

Section 5.5 (page 418)

2. $\frac{3}{4}$ 4. $\frac{24}{25}$ 6. $\frac{25}{7}$ 8. $\frac{7}{24}$
 10. $\frac{\pi}{2}, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$ 12. $\frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{3\pi}{2}, \frac{7\pi}{4}$
 14. $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{7\pi}{6}, \frac{3\pi}{2}, \frac{11\pi}{6}$
 16. $0, \frac{\pi}{4}, \frac{\pi}{2}, \frac{3\pi}{4}, \pi, \frac{5\pi}{4}, \frac{3\pi}{2}, \frac{7\pi}{4}$ 18. $3 \sin 2x + 4$
 20. $\cos 2x$
 22. $\sin 2u = -\frac{12\sqrt{5}}{49}$ 24. $\sin 2u = -\frac{12}{37}$
 $\cos 2u = -\frac{41}{49}$ $\cos 2u = \frac{35}{37}$
 $\tan 2u = \frac{12\sqrt{5}}{41}$ $\tan 2u = -\frac{12}{35}$
 26. $\frac{1}{8}(3 - 4 \cos 2x + \cos 4x)$
 28. $\frac{1}{32}(10 + 15 \cos 2x + 6 \cos 4x + \cos 6x)$
 30. $\frac{1}{32}(2 - \cos 2x - 2 \cos 4x + \cos 6x)$
 32. $\frac{\sqrt{26}}{26}$ 34. $\frac{\sqrt{26}}{5}$ 36. 5 38. $\frac{\sqrt{26}}{13}$
 40. $\sin 165^\circ = \frac{\sqrt{2-\sqrt{3}}}{2}$
 $\cos 165^\circ = -\frac{\sqrt{2+\sqrt{3}}}{2}$
 $\tan 165^\circ = -2 + \sqrt{3}$