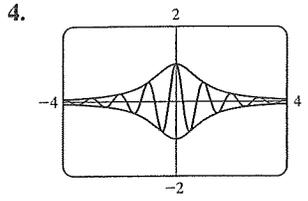
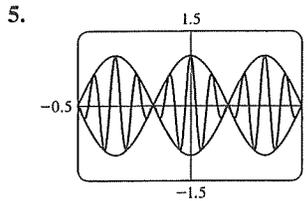


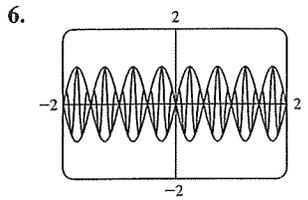
3.  $y = \sqrt{x} \sin 5\pi x$  is a sine curve that lies between the graphs of  $y = \sqrt{x}$  and  $y = -\sqrt{x}$



4.  $y = \frac{\cos 2\pi x}{1+x^2}$  is a cosine curve that lies between the graphs of  $y = \frac{1}{1+x^2}$  and  $y = -\frac{1}{1+x^2}$



5.  $y = \cos 3\pi x \cos 21\pi x$  is a cosine curve that lies between the graphs of  $y = \cos 3\pi x$  and  $y = -\cos 3\pi x$



6.  $y = \sin 2\pi x \sin 10\pi x$  is a sine curve that lies between the graphs of  $y = \sin 2\pi x$  and  $y = -\sin 2\pi x$

7. Maximum value 1.76 when  $x \approx 0.94$ , minimum value  $-1.76$  when  $x \approx -0.94$  (The same maximum and minimum values occur infinitely many other values of  $x$ .)

8. Maximum value 6.97 when  $x \approx 5.24$ , minimum value  $-0.68$  when  $x \approx 1.05$  (The same maximum and minimum values occur at infinitely many other values of  $x$ .)

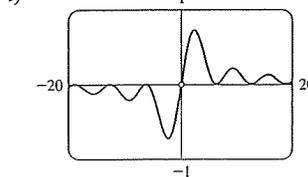
9. Maximum value 3.00 when  $x \approx 1.57$ , minimum value  $-1.00$  when  $x \approx -1.57$  (The same maximum and minimum values occur infinitely many other values of  $x$ .)

10. Maximum value 0.58 when  $x \approx 5.76$  (exact value is  $= 11\pi/6$ ); Minimum value  $-0.58$  when  $x \approx 3.67$  (exact value is  $= 7\pi/6$ ) (The same maximum and minimum values occur at infinitely many other values of  $x$ .)

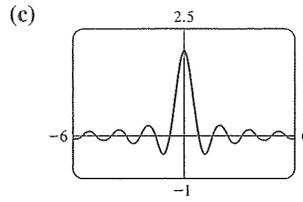
1. 1.16 72. 1.11 73. 0.34, 2.80 74. 0.74

5. (a) Odd (b)  $0, \pm 2\pi, \pm 4\pi, \pm 6\pi, \dots$

(d)  $f(x)$  approaches 0  
(e)  $f(x)$  approaches 0



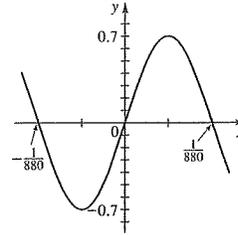
6. (a) Even  
(b)  $0, \pm \pi/4, \pm 2\pi/4, \pm 3\pi/4, \dots$



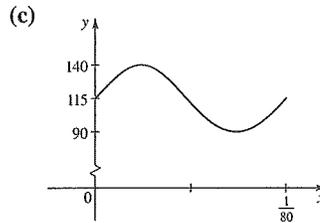
(d)  $f(x)$  approaches 0  
(e)  $f(x)$  approaches 2

77. (a) 20 s (b) 6 ft

78. (a)  $\frac{1}{440}$  s (b) 440 (c)

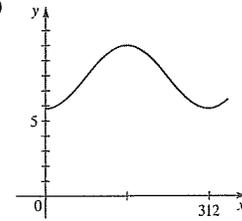


79. (a)  $\frac{1}{80}$  min (b) 80



(d)  $\frac{140}{90}$ , it is higher than normal

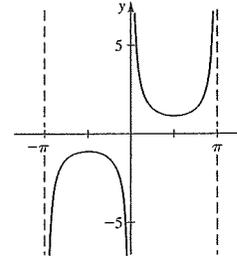
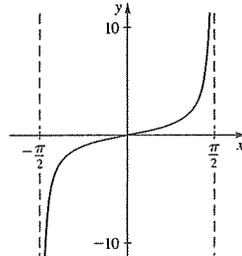
80. (a) 312 days (b) 10, 5.8 (c)



SECTION 5.4 ■ PAGE 405

1.  $\pi; \frac{\pi}{2} + n\pi, n$  an integer

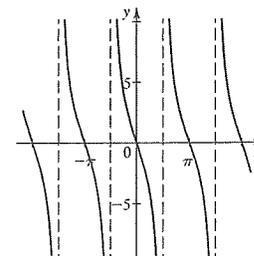
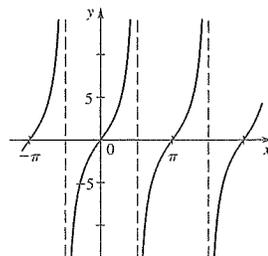
2.  $2\pi; n\pi, n$  an integer



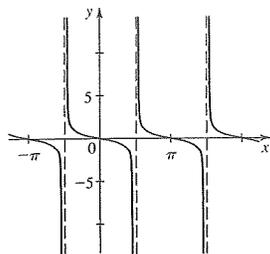
3. II 4. III 5. VI 6. I 7. IV 8. V

9.  $\pi$

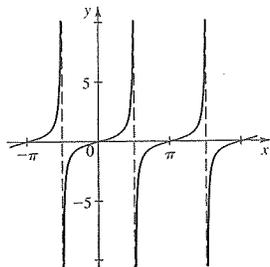
10.  $\pi$



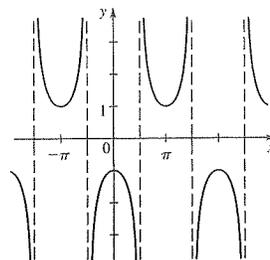
11.  $\pi$



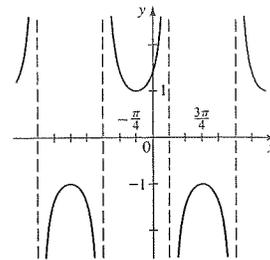
12.  $\pi$



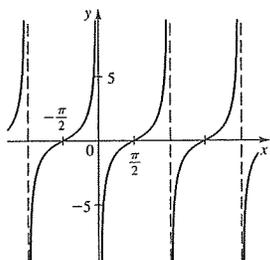
21.  $2\pi$



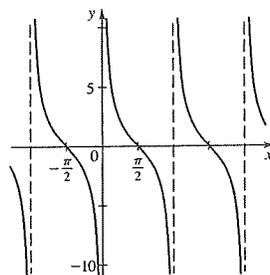
22.  $2\pi$



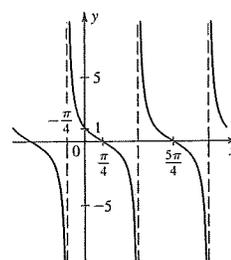
13.  $\pi$



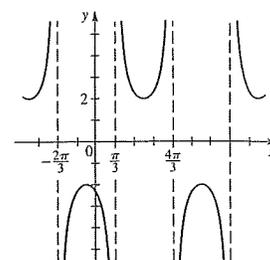
14.  $\pi$



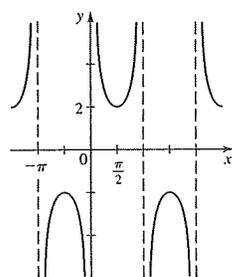
23.  $\pi$



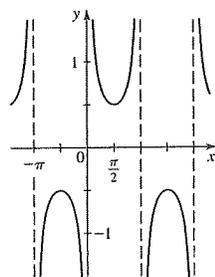
24.  $2\pi$



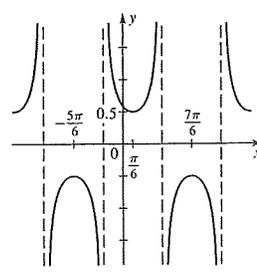
15.  $2\pi$



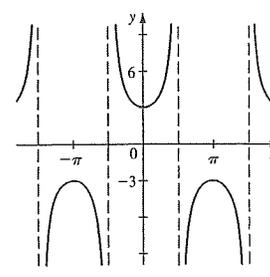
16.  $2\pi$



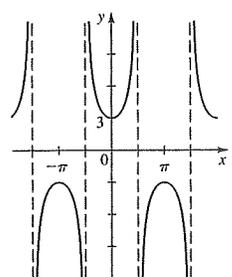
25.  $2\pi$



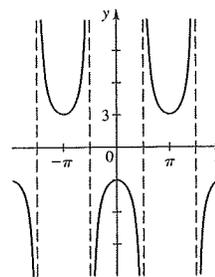
26.  $2\pi$



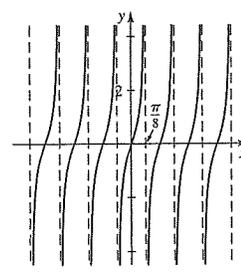
17.  $2\pi$



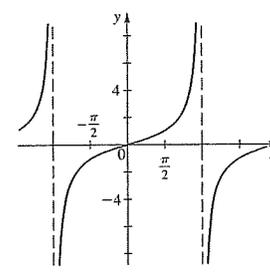
18.  $2\pi$



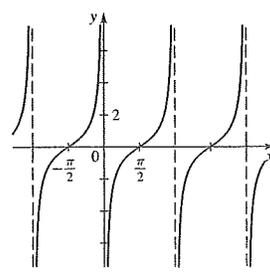
27.  $\pi/4$



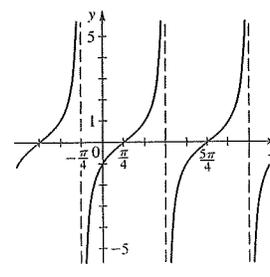
28.  $2\pi$



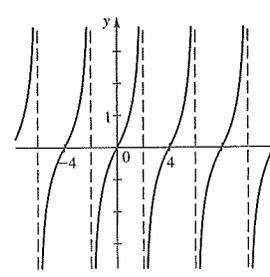
19.  $\pi$



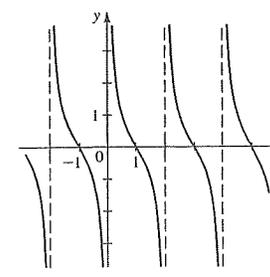
20.  $\pi$



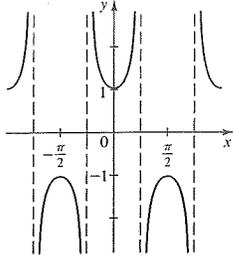
29. 4



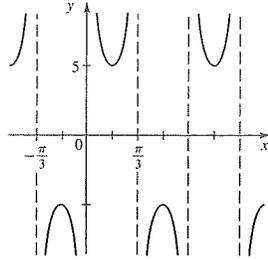
30. 2



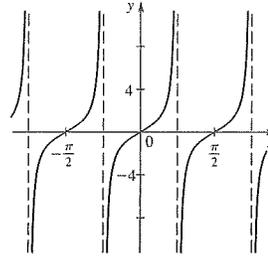
31.  $\pi$



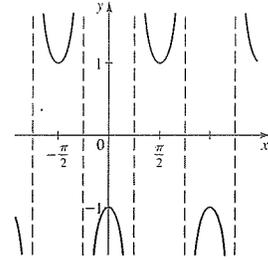
32.  $2\pi/3$



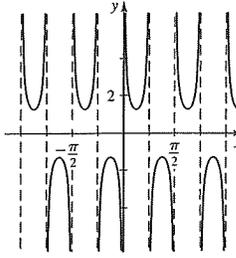
41.  $\pi/2$



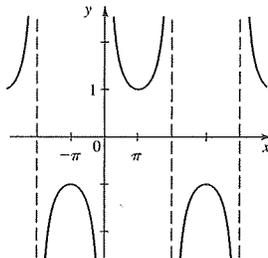
42.  $\pi$



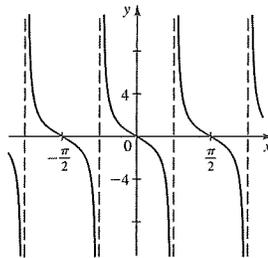
33.  $\pi/2$



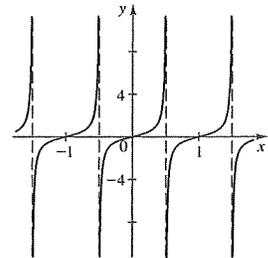
34.  $4\pi$



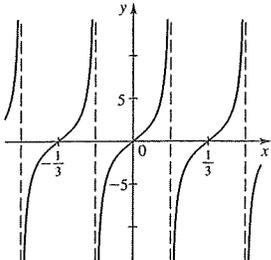
43.  $\pi/2$



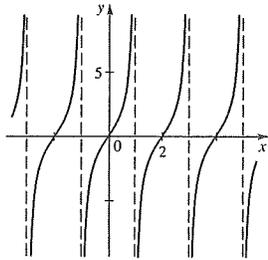
44. 1



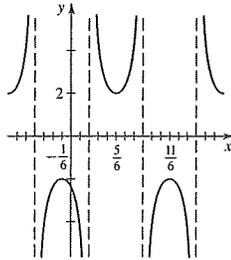
35.  $\frac{1}{3}$



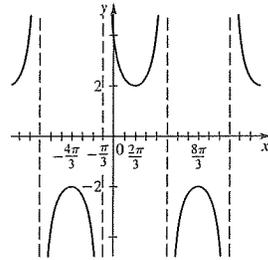
36. 2



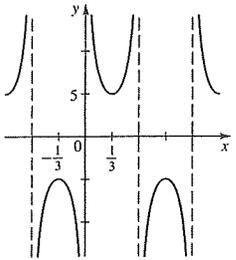
45. 2



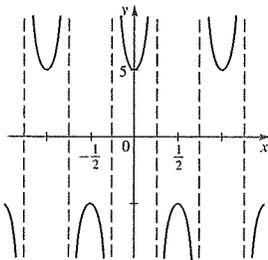
46.  $4\pi$



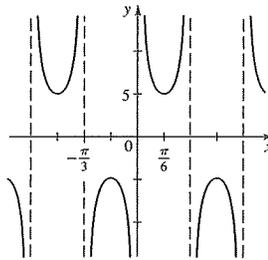
37.  $\frac{4}{3}$



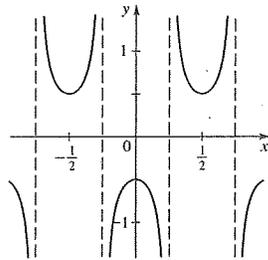
38. 1



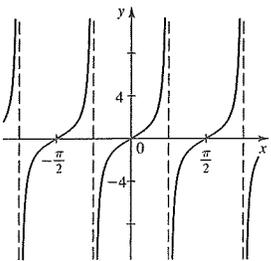
47.  $2\pi/3$



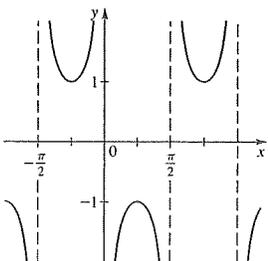
48. 1



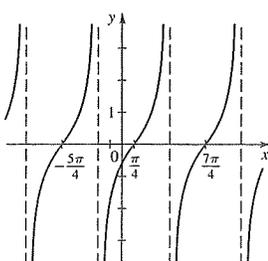
39.  $\pi/2$



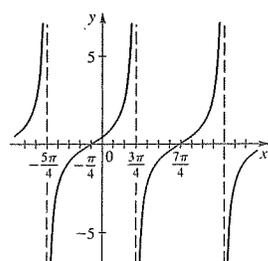
40.  $\pi$



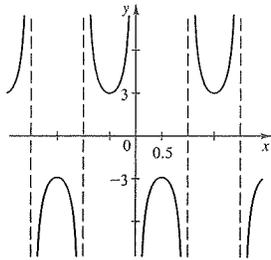
49.  $3\pi/2$



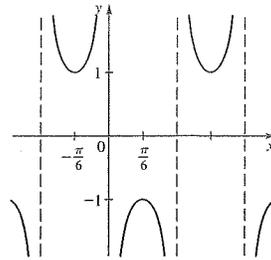
50.  $2\pi$



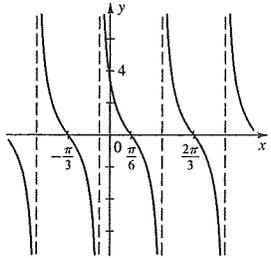
51. 2



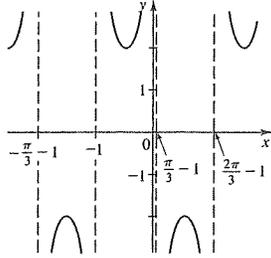
52.  $2\pi/3$



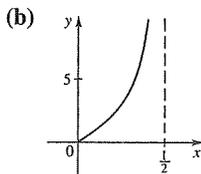
53.  $\pi/2$



54.  $2\pi/3$

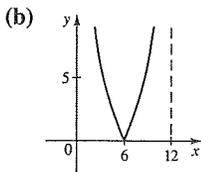


57. (a) 1.53 mi, 3.00 mi, 18.94 mi



(c)  $d(t)$  approaches  $\infty$

58. (a)  $S(2) = 10.39$  ft,  $S(8) = 3.46$  ft,  $S(11\frac{3}{4}) = 91.54$  ft,  $S(12)$  is undefined



(c) 3, 9; 9:00 A.M., 3:00 P.M.

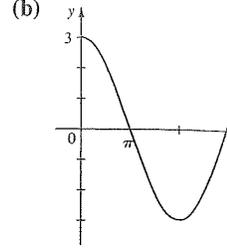
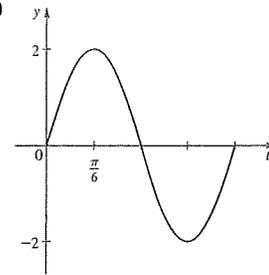
(d) The shadow gets increasingly longer.

SECTION 5.5 ■ PAGE 411

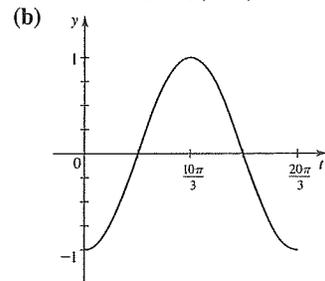
1. (a)  $[-\pi/2, \pi/2]$ ,  $y$ ,  $x$ ,  $\pi/6$ ,  $\pi/6$ ,  $\frac{1}{2}$   
 (b)  $[0, \pi]$ ;  $y$ ,  $x$ ,  $\pi/3$ ,  $\pi/3$ ,  $\frac{1}{2}$  2.  $[-1, 1]$ ; (b)  
 3. (a)  $\pi/2$  (b)  $\pi/3$  (c) Undefined 4. (a)  $-\pi/2$  (b)  $\pi/4$   
 (c) Undefined 5. (a)  $\pi$  (b)  $\pi/3$  (c)  $5\pi/6$  6. (a)  $\pi/4$   
 (b) 0 (c)  $3\pi/4$  7. (a)  $-\pi/4$  (b)  $\pi/3$  (c)  $\pi/6$  8. (a) 0  
 (b)  $-\pi/3$  (c)  $-\pi/6$  9. (a)  $2\pi/3$  (b)  $-\pi/4$  (c)  $\pi/4$   
 10. (a)  $\pi/2$  (b) 0 (c)  $-\pi/6$  11. 0.72973 12.  $-1.09491$   
 13. 2.01371 14. 1.11024 15. 2.75876 16. 0.13889  
 17. 1.47113 18.  $-1.53235$  19. 0.88998 20. Undefined  
 21.  $-0.26005$  22.  $-0.25168$  23.  $\frac{1}{4}$  24.  $\frac{2}{3}$  25. 5  
 26. Undefined 27. Undefined 28.  $\frac{3}{2}$  29.  $5\pi/6$  30.  $\pi/4$   
 31.  $-\pi/6$  32.  $-\pi/4$  33.  $\pi/6$  34.  $\pi/6$  35.  $\pi/6$  36.  $\pi/3$   
 37.  $-\pi/3$  38.  $\pi/4$  39.  $\sqrt{3}/3$  40. 1 41.  $\frac{1}{2}$  42. 1  
 43.  $-\sqrt{2}/2$  44.  $-\sqrt{3}/2$

SECTION 5.6 ■ PAGE 420

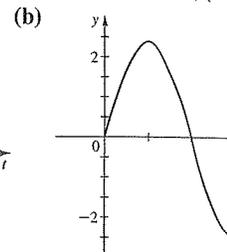
1. (a)  $a \sin \omega t$  (b)  $a \cos \omega t$   
 2. (a)  $ke^{-ct} \sin \omega t$  (b)  $ke^{-ct} \cos \omega t$   
 3. (a) 2,  $2\pi/3$ ,  $3/(2\pi)$  4. (a) 3,  $4\pi$ ,  $1/(4\pi)$   
 (b)



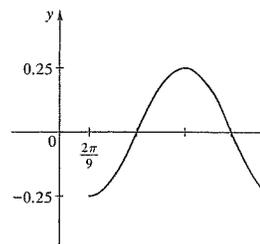
5. (a) 1,  $20\pi/3$ ,  $3/(20\pi)$



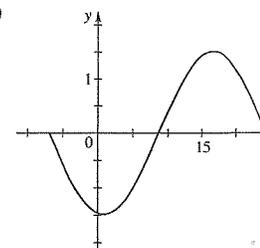
6. (a) 2.4,  $5\pi/9$ ,  $9/(5\pi)$



7. (a)  $\frac{1}{4}$ ,  $4\pi/3$ ,  $3/(4\pi)$  (b)



8. (a)  $\frac{3}{2}$ ,  $10\pi$ ,  $1/(10\pi)$  (b)



9. (a) 5,  $3\pi$ ,  $1/(3\pi)$  (b)

