27.

n	T_n	M_n	S_n
6	6.695473	6.252572	6.403292
12	6.474023	6.363008	6.400206

n	E_T	E_M	E_S
6	−0.295473	0.147428	−0.003292
12	−0.074023	0.036992	−0.000206

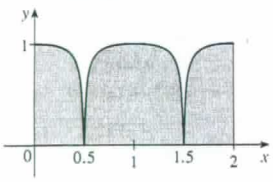
Observations are the same as after Example 1.

29. (a) 19.8 (b) 20.6 (c) $20.5\overline{3}$

31. (a) 23.44 (b) $0.341\overline{3}$ **33.** $37.7\overline{3}$ ft/s

35. 10,177 megawatt-hours **37.** 828 **39.** 6.0 **41.** 59.4

43.



EXERCISES 7.8 ▪ PAGE 515

Abbreviations: C, convergent; D, divergent

1. (a) Infinite interval (b) Infinite discontinuity
(c) Infinite discontinuity (d) Infinite interval

3. $\frac{1}{2} - 1/(2t^2)$; 0.495, 0.49995, 0.4999995; 0.5

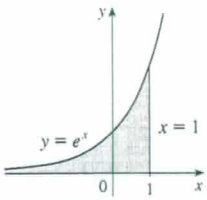
5. $\frac{1}{12}$ **7.** D **9.** $2e^{-2}$ **11.** D **13.** 0 **15.** D

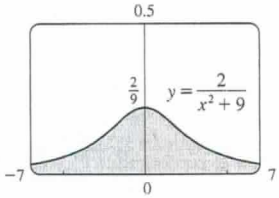
17. D **19.** $\frac{1}{25}$ **21.** D **23.** $\pi/9$

25. $\frac{1}{2}$ **27.** D **29.** $\frac{32}{3}$ **31.** D **33.** $\frac{75}{4}$

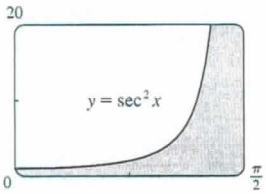
35. D **37.** $-2/e$ **39.** $\frac{8}{3}\ln 2 - \frac{8}{9}$

41. e **43.** $2\pi/3$





45. Infinite area

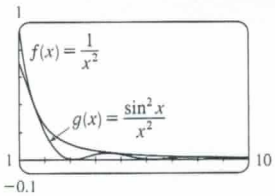


47. (a)

t	$\int_1^t [(\sin^2 x)/x^2]\,dx$
2	0.447453
5	0.577101
10	0.621306
100	0.668479
1,000	0.672957
10,000	0.673407

It appears that the integral is convergent.

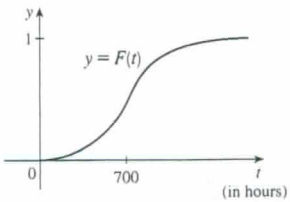
(c)



49. C **51.** D **53.** D **55.** π **57.** $p < 1$, $1/(1-p)$

59. $p > -1$, $-1/(p+1)^2$ **65.** $\sqrt{2GM/R}$

67. (a)



(b) The rate at which the fraction $F(t)$ increases as t increases
(c) 1; all bulbs burn out eventually

69. 1000

71. (a) $F(s) = 1/s$, $s > 0$ (b) $F(s) = 1/(s-1)$, $s > 1$
(c) $F(s) = 1/s^2$, $s > 0$

77. $C = 1$; $\ln 2$ **79.** No

CHAPTER 7 REVIEW ▪ PAGE 518

True-False Quiz

1. False **3.** False **5.** False **7.** False
9. (a) True (b) False **11.** False **13.** False

Exercises

1. $5 + 10\ln\frac{2}{3}$ **3.** $\ln 2$ **5.** $\frac{2}{15}$

7. $-\cos(\ln t) + C$ **9.** $\frac{64}{5}\ln 4 - \frac{124}{25}$

11. $\sqrt{3} - \frac{1}{3}\pi$ **13.** $3e^{\sqrt[3]{x}}(\sqrt[3]{x^2} - 2\sqrt[3]{x} + 2) + C$

15. $-\frac{1}{2}\ln|x| + \frac{3}{2}\ln|x+2| + C$

17. $x\sec x - \ln|\sec x + \tan x| + C$

19. $\frac{1}{18}\ln(9x^2 + 6x + 5) + \frac{1}{9}\tan^{-1}[\frac{1}{2}(3x+1)] + C$

21. $\ln|x - 2 + \sqrt{x^2 - 4x}| + C$

23. $\ln\left|\dfrac{\sqrt{x^2+1} - 1}{x}\right| + C$

25. $\frac{3}{2}\ln(x^2+1) - 3\tan^{-1}x + \sqrt{2}\tan^{-1}(x/\sqrt{2}) + C$

27. $\frac{2}{5}$ **29.** 0 **31.** $6 - \frac{3}{2}\pi$

33. $\dfrac{x}{\sqrt{4 - x^2}} - \sin^{-1}\left(\dfrac{x}{2}\right) + C$

35. $4\sqrt{1 + \sqrt{x}} + C$ **37.** $\frac{1}{2}\sin 2x - \frac{1}{8}\cos 4x + C$

39. $\frac{1}{8}e - \frac{1}{4}$ **41.** $\frac{1}{36}$ **43.** D

45. $4\ln 4 - 8$ **47.** $-\frac{4}{3}$ **49.** $\pi/4$

51. $(x+1)\ln(x^2 + 2x + 2) + 2\arctan(x+1) - 2x + C$

53. 0

55. $\frac{1}{4}(2x-1)\sqrt{4x^2 - 4x - 3} - \ln|2x - 1 + \sqrt{4x^2 - 4x - 3}| + C$