Lesson 1

p.218

38. $-2\cos x \sin x \sin x^2 + 2x\cos^2 x \cos x^2$

p.222

58. $v = \dfrac{dx}{dt} = \dfrac{4.0\sec^2 4.0t}{\sqrt{\tan 4.0t}}$, $v(0.96) = 7.4\,\text{ft/s}$

Lesson 2

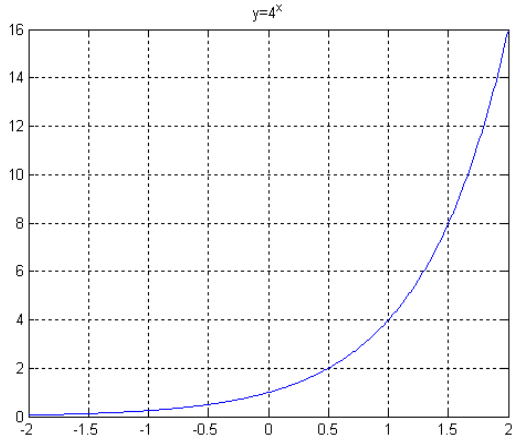
p.232

4. $\log_{27} 3 = \dfrac{1}{3}$

14. 16

20. $\dfrac{1}{5}$

22.



28. $\log_5 \dfrac{7}{6}$

30. $\log_a x^5 y$

38. $2 + 2\log_2 x$

46. $\log_{10} x + \dfrac{1}{2}\log_{10}\left(x^2+1\right)$

Lesson 3

p.237

2. $\frac{1}{x}$

8. $\frac{12}{x}$

16. $-\frac{1}{2x}$

22. $-\frac{1}{x(2x-1)}$

28. $\frac{1}{2x}-\tan x$

32. $\frac{1}{2x\sqrt{\ln x}}$

Lesson 4

p.240

6. $4te^{2t^2}$

18. $\frac{e^x(x-2)}{x^3}$

20. $e^{\theta^2}(2\theta\cos\theta-\sin\theta)$

30. $\frac{e^x+1-xe^x\ln x}{x(e^x+1)^2}$

Lesson 5

p.247

10. $v=\frac{dx}{dt}=-4\sin 2t+4\cos 4t,\ \ v(\pi/4)=-8$ m/s

16. $-0.73\ ^\circ C/\min$

Lesson 6

p.254

4. $2\sqrt{x+2}+C$

6. $-\frac{1}{4}\cos^4 x+C$

12. $\frac{1}{3}\left(1+e^{2\theta}\right)^{3/2}+C$

32. $\frac{1}{4}(1+\sin z)^4+C$

Lesson 7

p.257

4. $-\frac{1}{4}\ln\left|1-2x^2\right|+C$

10. $\frac{1}{6}e^{6x}+C$

20. $\frac{1}{2}e^{\tan 2x}+C$

38. $\frac{1}{2}\left(1-\frac{1}{e}\right)$

48. ln 2

50. 1

Lesson 8

p.260

2. $-\frac{1}{3}\cos 3x+C$

10. $\frac{1}{5}\tan 5t+C$

22. $\ln\left|\sec e^x\right| + C$

28. $-\frac{1}{2}\csc^2 x + C$

34. $\frac{1}{4}$

42. 5 sin8 or 4.9468

Lesson 9

p.278

2. $x\sin x + \cos x + C$

6. $x\ln x - x + C$

10. $-\frac{\ln x}{x} - \frac{1}{x} + C$

12. $-x^2\cos x + 2x\sin x + 2\cos x + C$

Lesson 10

p.278

20. $-\frac{1}{2}e^{-x}\left(\cos x + \sin x\right) + C$

22. $\frac{1}{2}\sec x\tan x + \frac{1}{2}\ln\left|\sec x + \tan x\right| + C$

26. $\pi\left(\pi - 2\right)$

Lesson 13

p.287

2. $x - 7\ln\left|x+2\right| + C$

10. $-2\ln\left|x-2\right| - \frac{1}{x-2} + C$

12. $-\frac{4}{x+2}+C$

Lesson 14

p.288

18. $\frac{2}{x-3}+\frac{3}{x^2+9}$

20. $\frac{2}{x-1}-\frac{1}{x+2}+\frac{1}{x^2+1}$

22. $\frac{x}{x^2+1}+\frac{2x}{\left(x^2+1\right)^2}$

Lesson 15

p.291 All the answers are available in the back of the textbook (pp.498)

Lesson 16

p.365

2. 3

4. 5

10. $\frac{10}{11}$

12. $\frac{5}{8}$

20. $\frac{5}{333}$

Lesson 17

p.376

2. Verify.

8. Verify.

12. Verify.

Lesson 18

p.380

4. $e^{-x^2} = 1 - x^2 + \frac{x^4}{2!} - \frac{x^6}{3!} + \frac{x^8}{4!} - \ldots$

12. $x\ln(1+x) = x^2 - \frac{x^3}{2} + \frac{x^4}{3} - \frac{x^5}{4} + \ldots$

14. $x^2 \sin 2x = 2x^3 - \frac{2^3 x^5}{3!} + \frac{2^5 x^7}{5!} - \ldots$

18. $-\frac{x}{3!} + \frac{x^3}{5!} - \frac{x^5}{7!} + \ldots$

Lesson 19

p.386

4. 0.9396951, -0.0000025, 0.9397

12. 2.71828

14. -0.08128

Lesson 20

p.386

None

Lesson 21

p.397

2. a. $a_0 = 1,\ a_1 = a_2 = 0$ b. $b_1 = \frac{2}{\pi},\ b_2 = 0,\ b_3 = \frac{2}{3\pi}$

c. $f(t) = \frac{1}{2} + \frac{2}{\pi}\left(\sin t + \frac{1}{3}\sin 3t + \frac{1}{5}\sin 5t + \ldots\right)$

4. a. $a_0 = a_1 = a_2 = 0$ b. $b_1 = \frac{12}{\pi},\ b_2 = 0,\ b_3 = \frac{4}{\pi}$

c. $f(t) = \frac{12}{\pi}\left(\sin\frac{\pi t}{2} + \frac{1}{3}\sin\frac{3\pi t}{2} + \frac{1}{5}\sin\frac{5\pi t}{2} + \ldots\right)$

Lesson 22

p.397

6. $f(t) = 1 - \frac{8}{\pi^2}\left(\cos\frac{\pi t}{2} + \frac{1}{3^2}\cos\frac{3\pi t}{2} + \frac{1}{5^2}\cos\frac{5\pi t}{2} + \ldots\right)$

8. $f(t) = \frac{\pi}{2} + \frac{4}{\pi}\left(\cos t + \frac{1}{3^2}\cos 3t + \frac{1}{5^2}\cos 5t + \ldots\right)$

p. 398

26. Hint: Use equations (10.33), (10.34), (10.35), (10.36).

Lesson 25

p.402

2. show!

4. show!

18. $y = \frac{1}{2}x^4 - 2$

20. $y = \sin x + 1$

Lesson 26

p.407

8. $\sin x + \ln|y| = c$

36. $\frac{1}{y} + \ln|1+x| + 1 = 0$

Lesson 27

p.412

2. $y = -2 + ce^x$

12. $y = \frac{e^x + c}{x^2}$

36. $y = \sin x$

Lesson 28

p.419

6. 140 days

8. 6.29 hours

12. $6.96^\circ C$

Lesson 29

p.419

14. 7.68 minutes

16. $18.27^\circ C$

22. $x^2 + 2y^2 = k$

24. $xy = k$

26. $x^2 + 3y^2 = k$

Lesson 30

p.431

2. $y = c_1 e^{4x} + c_2 e^{-5x}$

4. $y = c_1 e^{2x} + c_2 e^{-2x}$

12. $y = e^{2x} - e^{x}$

14. $y = \frac{4}{3} e^{x} - \frac{1}{3} e^{-5x}$

30. $y = \frac{2}{5} e^{x} + \frac{3}{5} e^{-(2/3)x}$

Lesson 31

p.434

4. $y = c_1 e^{-(1/2)x} + c_2 x e^{-(1/2)x}$

10. $y = e^{(1/2)x}\left(c_1 \cos\frac{\sqrt{3}}{2} x + c_2 \sin\frac{\sqrt{3}}{2} x \right)$

46. $y = -2x e^{-2(x+1)}$

Lesson 32

p.440

8. $y = c_1 \cos 2x + c_2 \sin 2x + \frac{1}{2} x^2 - \frac{1}{4} x - \frac{1}{4}$

10. $y = e^{-(1/2)x}\left(c_1 \cos\frac{\sqrt{7}}{2} x + c_2 \sin\frac{\sqrt{7}}{2} x \right) + \frac{3}{2} e^{2x}$

14. $y = c_1 e^{2x} + c_2 e^{-2x} + \cos x$

16. $y = c_1 e^{4x} + c_2 e^{-x} - \frac{5}{34}\cos x - \frac{3}{34}\sin x$

20. $y = c_1 e^{x} + c_2 e^{-x} + \frac{1}{3} e^{2x} - 4$

Lesson 33

p. 441

24. $y = c_1 \cos\sqrt{3}x + c_2 \sin\sqrt{3}x + 2xe^{x} - e^{x} + 1$

30. $y = e^{x}\left(-\frac{5}{2}\cos 2x + \frac{3}{4}\sin 2x\right) + \frac{1}{2}\cos x + \sin x$

40. $y_p = -\frac{1}{5}e^{x} + \frac{1}{7}\sin x$

Lesson 34

p. 449

2. $x(t) = -\frac{7}{12}\cos 8t$

4. $x(t) = -\frac{7}{12}\cos 8t - \frac{1}{24}\sin 8t + \frac{1}{12}\sin 4t$

10. $x(t) = e^{-(1/2)t}\left(-\frac{1}{3}\cos\frac{1}{2}\sqrt{255}t - \frac{1}{3\sqrt{255}}\sin\frac{1}{2}\sqrt{255}t\right)$

14. $x(t) = \frac{1}{4}e^{-8t} + 2te^{-8t}$

16. $x(t) = \frac{1}{4}e^{-8t} + \frac{7}{4}te^{-8t} + \frac{1}{32}\sin 8t$

Lesson 35

p.450

All the answers are available in the back of the textbook (pp.512)

Lesson 38

p. 459

2. $F(s) = \dfrac{5}{s-2}$

10. $F(s) = \dfrac{4}{(s-3)^3}$

12. $F(s) = \dfrac{5}{s^2} + \dfrac{3}{s-2}$

Lesson 39

p. 459

14. $f(t) = 3e^{5t}$

16. $f(t) = \cos\sqrt{7}t$

20. $f(t) = t\cos 2t$

24. $f(t) = \dfrac{5}{3}\sin 3t$

Lesson 40

p. 459

38. $f(t) = e^{t} + e^{-t} - 2$

42. $f(t) = \dfrac{1}{4}e^{2t} - \dfrac{1}{2}t - \dfrac{1}{4}$

48. $f(t) = e^{-2t} + te^{-t} - e^{-t}$

Lesson 41

p. 464

8. $f(t) = \cos 2t$

12. $f(t) = \frac{5}{8}\sin 2t - \frac{1}{4}t\cos 2t$

14. $f(t) = \frac{3}{2}\sin t - \frac{1}{2}t\cos t$

Lesson 42

p. 464

16. $f(t) = -\frac{1}{3}\cos 3t + \frac{2}{3}\sin 3t + \frac{1}{3}e^{-6t}$

18. $f(t) = e^{2t} - 2te^{-3t}$

24. $f(t) = \frac{4}{5}e^{3t} - e^{2t} + \frac{1}{5}e^{-2t}$

28. $f(t) = 2e^{t} - e^{2t}\cos t$