DIFFERENTIAL EQUATIONS: A MODELING APPROACH

by Glenn Ledder

Corrections for the First Printing

Corrections to the Exercise Statements

p. 162, Exercise 3.3.24 The reference should be to Exercise 23, not Exercise 22.

p. 168, Exercise 3.4.6 The differential equation should be $y''' - 2y'' - y' + 2y = 0$.

p. 169, Exercise 3.4.12*b* The mass should be one-half of that needed for critical damping.

p. 178, Exercise 3.5.14 The mass should be twice that needed for critical damping.

p. 311, Exercise 5.3.18*c* Delete the last sentence.

p. 356, Exercise 6.2.25 The inequality in part b should be $4b^3d < 27c^2e^2$ and the condition to be explained in part d should be $d(b + ce) > 1$.

p. 386, Exercise 6.5.5 The initial conditions should be (0, 1) rather than (1, -2).

p. 396, Exercise 6.6.11*c* The form of the third solution should have $(c_1\mathbf{u} + c_2\mathbf{v})$ instead of $\mathbf{v}$.

p. 408, Exercises 6.7.7 and 6.7.8 Change "the system $\mathbf{x}' = \mathbf{A}\mathbf{x}$" to "the corresponding nonlinear system $\mathbf{x}' = \mathbf{f}(\mathbf{x})$"; elsewhere, change $\mathbf{A}$ to $\mathbf{J}(0, 0)$.

p. 409, Exercise 6.7.10 Replace $\epsilon = e/(qr)$ with $R = qr/e$, assume $H = 0.5$ for parts b and c, eliminate the phrase "in the limit $\epsilon \to 0$", change $\epsilon = 0.2$ to $R = 5$.

p. 418, Exercise C6.1*b* Replace the old wording with "Now suppose we divide the interval $0 < y < y_0$ into n equal subdivisions and think of each subdivision as having its own decay time. Write down the formula for the average decay time of the n subdivisions."

p. 419, Exercise C6.8 Replace 4.2 with 0.00838

p. 458, Exercise 7.4.13 Delete part c

p. 459, Exercise 7.4.14*c* Use the Laplace transform method, not the method of variation of parameters

p. 467, Exercises 7.5.1 through 7.5.4 The references to Section 4.6 should be for Exercises 5-8, not Exercises1-4

p. 539, Exercise C8.8 The membrane is flat, circular with radius 1, and edge fixed in place. The equation to be demonstrated is $\int_0^1 rJ_0(z_n r)J_0(z_m r)\,dr = 0$, and the hint should read "Show that there is an integral Q such that $\int_0^1 rJ_0(z_n r)J_0(z_m r)\,dr = \frac{z_m}{z_n}Q = \frac{z_n}{z_m}Q$."

Wrong Answers

The answers provided for Exercises 3.6.9, 3.7.1, 3.7.5, 4.4.11*f*, 4.5.33, 6.1.15, 7.5.3 are incorrect.