Errata for
Introduction to Dynamical Systems: Discrete and Continuous, 2nd edition
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p. 58 L. 13: (Problem 4) More complete statement of the problem is as follows:
Consider an LRC electric circuit with linear inductor, resistor, and capacitor: \( L \frac{di_L}{dt} = v_L, \ v_R = Ri_R, \)
and \( C \frac{dv_C}{dt} = i_C \) with \( R > 0, \ L > 0, \) and \( C > 0. \) Setting the two variables \( x = i_R = i_L = i_C \) and \( y = v_C, \)
we get the system of linear differential equations
\[
L \frac{dx}{dt} = -Rx - y \\
C \frac{dy}{dt} = x.
\]
(Compare with Section 6.8.2 for a nonlinear resistor.) Sketch the phase portrait for the three cases (a) \( R^2 > 4L/C, \) (b) \( R^2 = 4L/C, \) and (c) \( R^2 < 4L/C. \) What happens when \( R = 0 \) but \( L > 0 \) and \( C > 0. \)

p. 99 L. 18: \( \tau < \min \left\{ \frac{r}{K}, \frac{1}{L} \right\} \)

p. 101 L. 6: Insert the following sentence: “For a small time interval, both solutions are in some closed ball \( \bar{B}(x_0, r) \) and there is some constant \( L \) as in Theorem 3.3.1.” Then,

p. 113 L. 10: Insert the following: “Also assume that the differential equation is defined in all of \( \bar{B}(0, C). \)"

p. 148 L. -4:
\[
DF(\mathbf{x}^*) = \begin{pmatrix}
-x_1^* & -\alpha x_1^* & -\beta x_1^* \\
-\beta x_2^* & -x_2^* & -\alpha x_2^* \\
-\alpha x_3^* & -\beta x_3^* & -x_3^*
\end{pmatrix}.
\]

p. 149 L. 2:
\[
\frac{1}{1 + \alpha + \beta} \left( -1 + \frac{\alpha + \beta}{2} \right) = \frac{\alpha + \beta - 2}{2(1 + \alpha + \beta)} > 0.
\]

p. 149 L. 1-2: (An alternative argument is as follows:) Once we know that two eigenvalues are complex pairs, then we can find their real parts as follows.
\[
2 \text{Re}(\lambda_2) = \lambda_2 + \lambda_3 \\
\lambda_1 + \lambda_2 + \lambda_3 = \text{tr}(DF(\mathbf{x}^*)) = -\frac{3}{1 + \alpha + \beta} \\
2 \text{Re}(\lambda_2) = \frac{-3}{1 + \alpha + \beta} - (-1) \\
= \frac{\alpha + \beta - 2}{1 + \alpha + \beta} \\
\text{Re}(\lambda_2) = \text{Re}(\lambda_3) = \frac{\alpha + \beta - 2}{2(1 + \alpha + \beta)} > 0.
\]

p. 149 L. -12: Therefore, any orbit with \( S(0) > 0 \) must enter and remain in the set where \( S \leq 2. \)

p. 149 L. -3: strict Lyapunov function and any trajectory off the diagonal must go to the minimum

p. 204 L. 10: Since \( \tilde{S}_f = \bigcup_{j \geq 1} S_{j^*}, \)

p. 204 L. 8-7: Better, “For all \( x \in \text{int}(S), \) \( z = Ax \in W, \) so \( c \cdot Ax < 0. \)"

p. 209 L. 1: \( f_j'(x_j) > 0 \)
p. 348 L -4: delete “most initial conditions do converge to a root of the polynomial, and certainly;”, so it reads “Still, if we start near a root ...”
p. 376 L -13: delete “most initial conditions do converge to a root of the polynomial, and certainly;”, so it reads “Still, if we start near a root ...”