Solution Manual Errata for Ordinary Differential Equations
Adkins/Davidson

- Problem 1.4.13 is incorrect. It should read as follows:

  The given equation is in standard form, $p(t) = \cos t$, an antiderivative is $P(t) = \sin t$, and the integrating factor is $\mu(t) = \mathrm{e}^{\sin t}$. Now multiply by the integrating factor to get

  $$\mathrm{e}^{\sin t}y' + (\cos t)\mathrm{e}^{\sin t}y = (\cos t)\mathrm{e}^{\sin t},$$

  the left hand side of which is a perfect derivative $((\mathrm{e}^{\sin t})y)'$. Thus

  $$((\mathrm{e}^{\sin t})y)' = (\cos t)\mathrm{e}^{\sin t}$$

  and taking antiderivatives of both sides gives $(\mathrm{e}^{\sin t})y = \mathrm{e}^{\sin t} + c$ where $c \in \mathbb{R}$ is a constant. Now multiply by $\mathrm{e}^{-\sin t}$ to get $y = 1 + c\mathrm{e}^{-\sin t}$ for the general solution. To satisfy the initial condition, $0 = y(0) = 1 + c\mathrm{e}^{-\sin 0} = 1 + c$, so $c = -1$. Thus, the solution of the initial value problem is $y = 1 - \mathrm{e}^{-\sin t}$

- Problem 1.4.15 has an error. It should read as follows: The given linear differential equation is in standard form, $p(t) = \frac{-2}{t}$, an antiderivative is $P(t) = -2\ln t = \ln t^{-2}$, and the integrating factor is $\mu(t) = t^{-2}$. Now multiply by the integrating factor to get

  $$t^{-2}y' - \frac{2}{t^3}y = \frac{t+1}{t^3} = t^{-2} + t^{-3},$$

  the left hand side of which is a perfect derivative $(t^{-2}y)'$. Thus

  $$(t^{-2}y)' = t^{-2} + t^{-3}$$

  and taking antiderivatives of both sides gives $(t^{-2})y = -t^{-1} - \frac{t^{-2}}{2} + c$ where $c \in \mathbb{R}$ is a constant. Now multiply by t^2 to and we get $y = -t - \frac{1}{2} + ct^2$ for the general solution. Letting $t = 1$ gives $-3 = y(1) = \frac{-3}{2} + c$ so $c = \frac{-3}{2}$ and

  $$y(t) = -t - \frac{1}{2} - \frac{3}{2}t^2.$$

- Problem 1.4.31 has a misprint. In line 11 $c = P_0 - cV$ should read $k = P_0 - cV$.

- Problem 2.8.11. In lines 2 and 3 the expression $\dfrac{1}{s^2 + b^2}$ should read $\dfrac{1}{a^2 + b^2}$.

- Problem 3.3.13 has a typographic error. The second line in the solution should read ... $y(t) = c_1e^t + c_2e^{-t}$.