4.3.8 $y(t) = c_1 e^{-3t/2} + c_2 e^{2t/3}$.

4.3.15 $y(t) = c_1 e^t \cos(\sqrt{3}t) + c_2 e^t \sin(\sqrt{3}t)$.

4.3.20 $y(t) = c_1 e^{-3t/2} + c_2 t e^{-3t/2}$.

4.3.36 $y(t) = 4e^{2t}\cos(3t) - \frac{8}{3}e^{2t}\sin(3t)$.

4.4.13 $k = 32/5$ and $v_0 = 0$.

4.5.2 $y(t) = -e^{-3t}$.

4.5.7 $y(t) = -\frac{21}{100}\cos(2t) + \frac{3}{100}\sin(2t)$.

4.5.10 $y(t) = -\frac{1}{5}\cos(3t)$.

4.5.20 $y(t) = -\frac{9}{5}e^{-t}\cos(t) - \frac{13}{5}e^{-t}\sin(t) - \frac{1}{5}\cos(2t) + \frac{2}{5}\sin(2t)$.

4.5.25 $y(t) = -\frac{2}{3}te^{-t}$.

4.5.38 $y(t) = \frac{1}{32}e^{-4t} - \frac{3}{8}t\cos(4t)$.

4.6.10 $y(t) = \frac{1}{42}t^7 e^{-t}$.

4.6.13 $y(t) = c_1 t + c_2 t^{-3} - \frac{1}{4}t^{-1}$.

Extra exercise $y(t) = \frac{3}{10}\sin(t) + \frac{3}{5}\cos(t)$.