Spring, 1998 – Exam 1 Answers

1. (a) $y = c_1 e^{x/2} + c_2 x e^{x/2}$
   (b) $y = e^{-x}(c_1 \cos x + c_2 \sin x)$
   (c) The functions x^2 and $1/x$ form a fundamental solution set because they are linearly independent. That is, the ratio $x^2/(1/x) = x^3$ is not a constant.
2. $\frac{2}{3}y^3 + \frac{1}{2}y^2 = x^3 + 2x^2 + 2x - \frac{1}{6}$
3. $y = \frac{1}{3}e^{-t} + e^{-4t}$
4. (a) $-\ln|1 - y| = \frac{1}{2}x^2$
5. $A(t) = 2t$
6. (a) $y(1/10) \approx 11/10$
   (b) $y(1/10) \approx 221/200$