

Name. _____

Applied Differential Equations 2250
Sample Midterm Exam 4 In-Class
Wednesday, 3 December, 2003

Instructions: This in-class exam is 15 minutes. Calculators and books are not allowed.

5. (Laplace transform)

(a) Find a formula for $X(s) = \mathcal{L}(x(t))$ by Laplace's method, then stop. Do not apply partial fractions nor solve for $x(t)$. Document steps.

$$x''(t) + 3x'(t) + 2x(t) = e^{-t} + t, \quad x(0) = x'(0) = 0.$$

(b) Solve for $x(t)$ in the formula

$$\mathcal{L}(x(t)) = \frac{10}{s} + \frac{s}{s^2 + 9} + \frac{s + 2}{s(s + 1)}.$$