Math 242, 1993, Exam 3

There are 5 problems. Each problem is worth 20 points. Use your own paper. SHOW your work. $\boxed{CIRCLE}$ your answer. CHECK your answers.

1. Find ALL solutions of $y'' + 2y' + y = e^{-x}$.

2. Find ALL solutions of $x^2y'' + 3xy' + y = 0$.

3. Find ALL solutions of $y'' + y = \sec^2 x$.

4. Find the Laplace transform of

$$f(t) = \begin{cases} 1 - t & \text{if } 0 \le 1 \le t \\ 0 & \text{if } 1 \le t. \end{cases}$$

5. USE THE METHOD OF LAPLACE TRANSFORMS to solve $x''+4x'+3x = 1$; $x(0) = 0$, and $x'(0) = 0$.