MA 341-001 Test 2

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Use your own paper to work the problems. On all problems, **show your work**.

When you finish, fold this paper lengthwise together with your work, so that this writing is on the outside. Write your name above, and turn in.

1. Determine the form you would use for a particular solution in the method of undetermined coefficients. **Do not solve for the coefficients.**

   (a) $y'' + 4y = te^{-2t}$

   (b) $y'' + 4y = 6\sin 2t$

2. Find the general solution using the method of undetermined coefficients.
$$y'' + 3y' + 2y = 8t^2 - 30$$

3. Use the method of variation of parameters to find a particular solution.
$$y'' - 2y' + y = t^{-3}e^t$$

4. Find $Y(s)$, the Laplace transform of the solution $y(t)$ of the following initial value problem. Write $Y(s)$ as a quotient of two polynomials with the denominator factored. **You do not need to multiply out the numerator.**

$$y'' + 6y' + 9y = t^3 e^{-5t}$$
$$y(0) = 2, \quad y'(0) = -3$$

5. Find the inverse Laplace transform of the following functions.

   (a) $\dfrac{10-2s}{s^2+2s+10}$

   (b) $\dfrac{s^2-4}{s^2(s-1)}$

   (c) $\dfrac{e^{-6s}}{(s+4)^3}$