

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Find the general solution of the linear second-order non-homogeneous differential equation

$$y'' - 4y = t \sin(2t).$$

2. Find the general solution of the linear second-order non-homogeneous differential equation

$$y'' - 3y' - 10y = e^{-2t}.$$

3. Use the method of **variation of parameters** to find the general solution of the linear second-order non-homogeneous differential equation

$$y'' - 2y' - 3y = te^{-t}.$$

(**Note:** This problem can also be solved with the method of undetermined coefficients, but this is not the method you are asked to apply.)