

YOUR NAME: _____

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

1. [2 points] Write a formula for the function $d_{1/2}(t)$ and then compute from scratch the Laplace transform $\mathcal{L}\{d_{1/2}(t)\}$.

2. [4 points] Use Laplace transforms to find the particular solution of the initial value problem

$$y'' + 4y' + 11y = \delta(t - 3), \quad y(0) = 0, \quad y'(0) = 0.$$

3. [2 points] Compute from scratch $(f * g)(t)$ if $f(t) = e^{2t}$ and $g(t) = e^{3t}$.

4. [4 points] Use Laplace transforms to find the particular solution of the initial value problem

$$y'' + 9y = g(t), \quad y(0) = 5, \quad y'(0) = -2.$$