

Name (Last, First)

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1. (4pts) Find a **general** solution to the nonhomogeneous Cauchy-Euler equation using variation of parameters.

$$t^2 y''(t) + 3ty'(t) + y(t) = t^{-1}$$

2. (1pt) Find a nonzero solution<sup>1</sup> to the following equation.

$$(t - 2)^2 y''(t) - 6(t - 2)y'(t) + 6y(t) = 0$$

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<sup>1</sup>Just one is enough.

3. (5pts) Find a **particular** solution to the n-homogeneous equation

$$ty''(t) - (t + 1)y'(t) + y(t) = t^2e^{2t},$$

given that, miraculously,  $f(t) = e^t$  is a solution to the corresponding homogeneous equation.