MATH 246 Groupwork 2.6 & 2.7 **Name:** _____

1. Consider the following initial value problem:

$$y'' - 5y' + 6y = te^{2t} \text{ with } y(0) = 1 \text{ and } y'(0) = -2$$

Use the Method of Undetermined Coefficients to find a specific solution to the nonhomogeneous DE, then write down the general solution to the DE, then solve the IVP.

2. Consider the differential equation

$$ty'' + y' = \frac{1}{t} \text{ with } t > 0$$

(a) Show that $Y_1(t) = 1$ and $Y_2 = \ln t$ form a fundamental pair for the associated homogeneous differential equation.

(b) Find a solution to the original differential equation using Variation of Parameters, then write down the general solution.