Math 231 Work Sheet 4 NAME:

Summary: This worksheet corresponds to sections 4.6 in the textbook.

1. (Variation of Parameters). Consider the differential equation $(t > 0)$

$$ty'' + y' = \frac{1}{t},$$

(a) Show that $Y_1(t) = 1$ and $Y_2(t) = \ln(t)$ form a fundamental pair for the associated homogeneous differential equation. (Hint: check $W[Y_1, Y_2] \neq 0$.)

(b) Find a solution to the original differential equation using Variation of Parameters. (Hint: first write the ODE into the standard form where the coefficient in front of y'' is 1.)

(c) Write down the general solution.