# Worksheet 8: The Wronskian; Complex Roots

MATH 2310, Spring 2019                                    Grade:        / 40

1. Determine the longest interval in which the following initial value problems are certain to have a unique twice differentiable solution. Do not solve.

   (a) (6 pts) $y'' + \cos(t)y' + 2\ln|t|y = 0,\quad y(2) = 3,\quad y'(2) = 1.$

   (b) (6 pts) $(t-1)y'' - 3ty' + 4y = \sin(t),\quad y(-2) = 2,\quad y'(-2) = 1.$

2. (8 pts) If the Wronskian $W$ of $f$ and $g$ is $t^2 e^t$ and if $f(t) = t$, find $g(t)$.

3. (20 pts) Find the solution of the initial value problem

$$y'' - 2y' + 5y = 0, \quad y(\pi/2) = 0, \quad y'(\pi/2) = 2$$