Quiz 10

MATH 2280, ORDINARY DIFFERENTIAL EQUATIONS, SPRING 2024

NAME: A#:

Problem 1. Exercise 24.1.g (10 points) Find the general solution of the following ordinary differential equation. Use variation of parameters even if another method might seem easier. For you convenience the equation is accompanied by a general solution to the corresponding homogeneous equation.

$$x^2\ y'' + x\ y' - y = \sqrt{x}, \qquad y_h = c_1\ x + c_2\ x^{-1}$$

Solution:

Problem 2. Exercise 27.7.c (10 points) Find the Laplace transform $Y(s)$ of the solution to the solution of the following initial value problelm. Just find $Y(s)$ using the ideas illustrate in Examples 27.1 and 27.2. Do NOT solve the problem using the the techniques developed before the introduction and definition of Laplace tranforms. Also, do not try to recover $y(t)$ from $Y(s)$.

$$y' + 3\ y = step_4(t)$$

with $y(0) = 0$.

Solution: