Math 202-Section 15 Home Quiz 8

Sr. Num.: ID. Num.: Name:

Q 1 [5 points]: Use the substitution $t = \ln x$ to solve the following differential equation:

$$2x^3y'' + 5x^2y' - 2xy = 3x^2 + 2x\ln x.$$

Q 2 [5 point]: Find a Cauchy Euler differential equation whose solution is:

$$y = \frac{x-1}{x^2}.$$

Q 3 [5 points] Use series solution to solve the differential equation

$$y'' + y = 0$$

about the point $x = 0$. Also, show that $y = c_0 \cos x + c_1 \sin x$.

Q 4 [5 points] Use power series solution centered at $x = 0$ to find a fundamental set of solutions for the differential equation

$$(x - 1)y'' + y' = 0.$$