Math 202-Section 15 Home Quiz 9

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

Q 1 [3 points]: Determine and classify all singular points of the differential equation:

$$x^3(x^3-1)y'' + 3x(x-1)y' + (x+1)y = 0.$$

Q 2 [2 point]: Consider the ordinary differential equation:

$$x^2y'' + 5xy' + (4-x^2)y = 0.$$

a) [5 points] Without using series, show that the indicial roots of the differential equation are equal.

b) [5 points] Find one series solution of the differential equation about the point $x = 0$, and use part a) to obtain the second solution.