King Fahd University of Petroleum and Minerals
Quiz 5 Math 202-131 Duration 40 minutes

Full Name:
ID: Serial number:

Question 1. Given the DE:

$$x^3(x^2-1)y''+x^2(x^2-1)y+3(x-1)y=0 \quad \text{where} \quad x\neq 1.$$

Find the singular and non singular points and determine the types of the singular points.

Question 2. Given the DE:

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

Find the region of validity of the power series (DO NOT SOLVE THE DE) solutions around

a) $x=0$

b) $x=-1$.

Question 3. Solve the DE: $2xy'' + y' - 2y = 0$ about $x = 0$.