King Fahd University Of Petroleum and Minerals
College of Sciences
Mathematics and Statistics Department
Math 202-12
Quiz#3-2

Name:..... ID#:..... Serial#:.....

1. Determine the singular points of the differential equation
   $\left(x^3-2x^2-3x\right)^2 y''+x\left(x-3\right)^2 y'-\left(x+1\right)y=0$
   Classify each singular point as regular or irregular.

2. $x=0$ is a regular singular point of the differential equation
   $x^2y''+xy'+\left(x^2-\frac{1}{4}\right)y=0.$
   Find the roots of the indical equation

3. Find two power series solutions of the differential equation $y'' + x^2 y = 0$ about the ordinary point $x = 0$.

4. Consider the following differential equation

   $3xy'' + y' - y = 0$

   (a) Find the indical equation and its roots

   (b) Find the power series solution associated to the largest indical root