King Fahd University Of Petroleum and Minerals
College of Sciences
Mathematics and Statistics Department
Math 260-02
Quiz#1

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

1. Verify that $y(x) = x^3(c + \ln x)$ satisfies the differential equation $xy' - 3y = x^3$. Then determine a value of the constant C so that $y(x)$ satisfies the initial condition $y(1) = 17$.

2. Find values of r so that $y = e^{rx}$ is a solution of the equation $y'' + y' - 2y = 0$.

3. Find the position function $x(t)$ of a moving particle with the acceleration $a(t) = \frac{1}{\sqrt{t+4}}$ and initial position $x_0 = 1$ and initial velocity $v_0 = -1$.

4. Find all solutions of the differential equation $\frac{dy}{dx} = 6x(y-1)^{\frac{2}{3}}$.

5. Solve the following differential equations

(a) $x^2y' = 1 - x^2 + y^2 - x^2y^2$

(b) $y' = (1 - y)\cos x$

6. A certain city had a population of $25,000$ in 1960 and a population of $30,000$ in 1970. Assume that its population will continue to grow exponentially at a constant rate. What population can its city planners expect in the year 1980?