

ING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
DEPARTMENT OF MATHEMATICAL SCIENCES
MATH 260-04
Quiz # 1
September 20, 2006

NAME:

ID#:

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1. For the differential equation $x \frac{dy}{dx} + 3y = 2x^5$

- (a) **(3points)** Verify that $y = \frac{1}{4}x^5 + Cx^{-3}$ is a general solution.
(b) **(3points)** Find a particular solution satisfying $y(2) = 1$.

2. **(4points)** Solve the initial value problem $\frac{dy}{dx} = \frac{10}{x^2+1}$, $y(1) = 2$.

3. **(2points)** Extra Credit In the Swimmers Problem, if the velocity v_R of flow of the water is represented by a cosine function, find an explicit representation of v_R as a function of x and then solve the differential equation $\frac{dy}{dx} = \frac{v_R}{v_S}$, where v_S is the swimmer's velocity (assumed to be constant).