Quiz 1

MA 262
Artur's Class

2014/08/28

Problem 1

Identify the order of the following differential equations and indicate if they are linear or non-linear. If non-linear, circle/identify the non-linear terms.

(a) $x^2 \frac{d^2y}{dx^2} + \frac{d^3y}{dx^3} = xy$

(b) $y\frac{d^2y}{dx^2} + \frac{dy}{dx} = x^2 y$

Problem 2

Determine values of r such that the function $y(x) = e^{rx}$ solves the differential equation

$$y'' + 2y' - 3y = 0.$$

Problem 3

Sketch the family of curves

$$y = cx^2.$$

Then find the differential equation giving the slope of the tangent line at the point (x, y) for this family.