Course:IN101

Instructor: Qazi Mazhar Ul Ha

Homework 2

Due Date: 1-Dec

※Please write out all steps in detail, along with the formulas or rules used.

- **Problem 1 (Rules for Finding Derivatives)** (50pts):
  - $\frac{d}{dx}[(4x^3 + x)(2x^4 - x^2 + 2)]$
  - $\frac{d}{dx}\left(\frac{4k}{7x^8}\right), k\ is\ a\ constant.$
  - $\frac{d}{dx}\left(\frac{3x^2+1}{x+4}\right)$
  - $\frac{d}{dx}(x^2 + \sqrt[3]{2x + (x^2 + 1)})^{10}$
  - $\frac{d}{dx}\sin(\cos(\tan(x)))$

- **Problem 2 (Implicit Differentiation)** (50pts):
  - $4x^2y - 2y = x^3 + 2$, $\frac{dy}{dx}$ = ? (10pts)
  - $x^2y + y^3 = \sin(x)$, $\frac{dy}{dx}$ = ? (10pts)
  - $\sin(\cos(x + y)) = x^2 + y^2$, $\frac{dy}{dx}$ = ? (10pts)
  - $tan^2(xy) + csc^2(x + y) = 1$, $\frac{dy}{dx}$ = ? (20pts)