King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics

Math 101 (Term 151) - Quiz 2

Student Name_____ **Student ID:** _____

Exercise 1 **[5 points]**

Let $f(x) = \begin{cases} 1+x^2 & ; \ x \leq 0 \\ 2-x & ; \ 0 < x \leq 2 \\ (x-2)^2 & ; \ x > 2 \end{cases}$

Study the continuity of f at 0 and 2; and determine all numbers at which f is continuous.

Exercise 2 **[3 points]**

Find $\lim_{x \to -\infty} x + \sqrt{x^2 + 2x} =$

Exercise 3 **[2 points]**

Let $f(x) = \begin{cases} x sin\frac{1}{x} & ; \ x \neq 0 \\ 0 & ; \ x = 0 \end{cases}$

Is f differentiable at 0? (Justify)