Serial No.:_____ Student Name:_____ Student Number: _____

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 13-2-2014

Problem 1: (10 points) Find the slope of the curve $y = \frac{1}{x+1}$ at the point P(2,1/3). Write the equation of the tangent line to the curve at that point.

Problem 2: (10 points) Use the precise definition of the limit to show that

$$\lim_{x \to 2} (3x - 2) = 4.$$

If $\in = 0.06$, find the largest corresponding $\delta > 0$ which satisfies the definition.

Problem 3: (14 points) Find the limit if it exists **[SOLVE ONLY TWO PARTS]**

a) $\lim_{x \to 1} \frac{x-1}{\sqrt{x+3}-2}$

b) $\lim_{x \to 1} (1-\sqrt{x}) \cos\frac{\pi}{x-1}$

c) $\lim_{x \to 0} \frac{\cos 2x - 1}{\sin x}$

Problem 4: (6 points) If $\lim_{x \to 0} \frac{1+x-g(x)}{x} = 2$, find $\lim_{x \to 0} g(x)$. Justify your answer.