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

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 15-6-2014

Problem 1: (6 points) Find the average rate of the function $y = x^2 - x$ with respect to x over the interval $[1, 1+h]$. What will happen when h approaches 0? What is the slope of the tangent line to the curve at that point (1,0)?

Problem 2: (18 points)

(i) Use the precise definition of the limit to show that $\lim_{x \to 2} (2 - 3x) = -4$.

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

(ii) For the limit $\lim_{x \to 3} \sqrt{x-2} = 1$, find a $\delta > 0$ that works for $\in = 1$ in the definition of the limit.

(iii) If $\lim_{x\to 1}\dfrac{2+x-f(x)}{x-1}=5$, find $\lim_{x\to 1} f(x)$. Justify your answer.

Problem 3: (18 points) Find the limit if it exists

a) $\lim_{x\to 3}\dfrac{x+3}{x^2+x-6}$

b) $\lim_{x\to 4}\dfrac{4x-x^2}{2-\sqrt{x}}$

c) $\lim_{x\to 1}(1-x)^2\cos\dfrac{6}{1-x^2}$ (Use the sandwich Theorem)