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

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 1-11-2008

Problem 1: (3 points) If it exists, find the limit. Use the symbols ∞ *or* $-\infty$ as appropriate.

$$\lim_{x\to 1^+}\left[\ln(\sqrt{x}-1)-\ln(x-1)\right]$$

Problem 2: (3 points) If $f(x)=x^3-x^2+x$ show that there is a number c such that $f(c)=15$.
(What is the name of the Theorem you used here?)

Problem 3: (2 points) Where is the function continuous?

(a) $y=\dfrac{x-\ln x}{\sqrt{3-x}}$

(b) $y=\ln(1+\cos x)$

Problem 4: (4 points) Use the $\in-\delta$ definition of the limit to show that $\lim_{x\to 2^+}\sqrt{x-2}=0$.

Problem 5: (3 points) Find all values of A and B which will make the function continuous

$$f(x)=\begin{cases} x-B & if \quad x<1 \\ A & if \quad x=1 \\ Ax-B & if \quad x>1 \end{cases}$$

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

Instructor: M. Z. Abu-Sbeih Math 101- Q1 Date: 1-11-2008

Problem 1: (3 points) If it exists, find the limit. Use the symbols ∞ *or* $-\infty$ as appropriate.

$$\lim_{x\to 1^+}\left[\ln(x-1)-\ln(\sqrt{x}-1)\right]$$

Problem 2: (3 points) If $f(x)=x^3-x^2+x$ show that there is a number c such that $f(c)=12$.
(What is the name of the Theorem you used here?)

Problem 3: (2 points) Where is the function continuous?

(a) $y=\dfrac{x+\ln x}{\sqrt{5-x}}$

(b) $y=\ln(1+\sin x)$

Problem 4: (4 points) Use the $\in-\delta$ definition of the limit to show that $\lim_{x\to 1^+}\sqrt{x-1}=0$.

Problem 5: (3 points) Find all values of A and B which will make the function continuous

$$f(x)=\begin{cases} x+A & if \quad x<1 \\ B & if \quad x=1 \\ Ax+B & if \quad x>1 \end{cases}$$