Due Date: October 19, 2011 Wednesday NAME:.....

Ali Sinan Sertöz STUDENT NO:.....

Math 113 Calculus – Homework 1

1	2	3	4	TOTAL
25	25	25	25	100

Please do not write anything inside the above boxes!

Check that there are 4 questions on your booklet. Write your name on top of every page. Show your work in reasonable detail. A correct answer without proper or too much reasoning may not get any credit.

Q-1) Consider the function $f(x) = \dfrac{1}{x}$ for $x > 0$.

For each given $\epsilon > 0$ and for each $x_0 > 0$, find explicitly a $\delta > 0$ (which usually depends both on ϵ and x_0) such that for all $x > 0$ with $|x - x_0| < \delta$ we will have $|f(x) - f(x_0)| < \epsilon$.

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Q-2) Consider the function $f(x) = \dfrac{1}{x}$ for $x > 0$.

Prove or disprove that given any $\epsilon > 0$, there exists a $\delta > 0$ (which depends only on ϵ) such that for all $x, y > 0$ with $|x - y| < \delta$ we will have $|f(x) - f(y)| < \epsilon$.

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Q-3) Consider the function $f(x) = \dfrac{1}{x}$ for $x \in [1, 5]$.

Prove or disprove that given any $\epsilon > 0$, there exists a $\delta > 0$ (which depends only on ϵ) such that for all $x, y \in [1, 5]$ with $|x - y| < \delta$ we will have $|f(x) - f(y)| < \epsilon$.

NAME: STUDENT NO:

Q-4) Consider the function $f(x) = \dfrac{1}{x}$ for $x \in [1, \infty)$.

Prove or disprove that given any $\epsilon > 0$, there exists a $\delta > 0$ (which depends only on ϵ) such that for all $x, y \in [1, \infty)$ with $|x - y| < \delta$ we will have $|f(x) - f(y)| < \epsilon$.