Mathematics 3790H – Analysis I: Introduction to analysis
TRENT UNIVERSITY, Winter 2014

Assignment #8
Due on Friday, 14 March, 2014.

Consider the following condition which a function $f : \mathbb{R} \to \mathbb{R}$ might satisfy at some point $a \in \mathbb{R}$:

($\star$) $f(q_n) \to f(a)$ for every sequence $\{q_n\}$ such that $q_n \to a$ and $q_n \in \mathbb{Q}$ for all n.

Note that this is a modification of the sequential definition of continuity of a function at a point.

1. Either show that $f(x)$ satisfies ($\star$) if and only if $f(x)$ is continuous at a, or find a counterexample to this assertion. *[10]*