

Name: SOLUTIONS

Quiz #1 - September 10, 2007

1. State the squeeze theorem precisely.

Suppose there is an $\epsilon > 0$ such that $f(x) \leq g(x) \leq h(x)$ for all $0 < |x - a| < \epsilon$. Suppose further that

$$\lim_{x \rightarrow a} f(x) = L = \lim_{x \rightarrow a} h(x).$$

Then $\lim_{x \rightarrow a} g(x) = L$.

2. Evaluate

$$\lim_{h \rightarrow 0} \left(\frac{1}{h} - \frac{1}{h^2 + h} \right)$$

$$\begin{aligned} \lim_{h \rightarrow 0} \left(\frac{1}{h} - \frac{1}{h^2 + h} \right) &= \lim_{h \rightarrow 0} \left(\frac{h+1}{h^2+h} - \frac{1}{h^2+h} \right) \\ &= \lim_{h \rightarrow 0} \left(\frac{h}{h^2+h} \right) \\ &= \lim_{h \rightarrow 0} \left(\frac{1}{h+1} \right) \\ &= 1 \end{aligned}$$