QUIZ

INTRO TO REAL ANALYSIS

Problem 1. Using the definition of functional limit, prove that
$$\lim_{x \to 2}(3x + 4) = 10.$$

Problem 2. Consider the (erroneous) claim that
$$\lim_{x \to 10} \frac{1}{[[x]]} = \frac{1}{10},$$
where $[[x]]$ denotes the greatest integer less than or equal to x.

(a) Find the largest δ that represents a proper response to the challenge of $\epsilon = \frac{1}{2}$. That is, find the largest δ for which $0 < |x - 10| < \delta$ implies $|f(x) - \frac{1}{10}| < \epsilon = \frac{1}{2}$.

(b) Find the largest δ that represents a proper response to $\epsilon = \frac{1}{50}$.

(c) Find the largest ϵ challenge for which there is no suitable δ response possible.