

QUIZ 2

Instructions: Complete the following problems. Be sure to show your work when you make ‘significant’ leaps in problem solving. Answers which are not accompanied by justification will receive little or no credit.

(1) (30 pts) Evaluate $\lim_{x \rightarrow 2} \frac{3x^2 - 4x - 4}{x^2 + 3x - 10}$, if it exists. If it does not exist, explain why.

(2) (30 pts) Evaluate $\lim_{h \rightarrow 1} \frac{\sqrt{10 - h} - 3}{h - 1}$, if it exists. If it does not exist, explain why.

(3) (30 pts) Evaluate $\lim_{x \rightarrow 1} \frac{e^x}{\ln(x)}$, if it exists. If it does not exist, explain why.

(4) (10 pts) In class we said that $\lim_{x \rightarrow 0} \left[\sin\left(\frac{1}{x}\right) \right]$ does not exist. Suppose we define a function $f(x)$ by the rule

$$f(x) = \begin{cases} \sin\left(\frac{1}{x}\right) & \text{if } x \neq 0 \\ 0 & \text{if } x = 0. \end{cases}$$

Is $f(x)$ continuous at 0? Justify your answer. (An answer with little or incorrect justification will receive severely reduced credit)