

MATH 1850 Sec 001
SINGLE VARIABLE CALCULUS I
QUIZ 2
January 24, 2013

Name (Last, First) Key

1. Find the limit

$$\begin{aligned} \lim_{x \rightarrow -1} \frac{x^2 - 3x - 4}{x + 1} \\ &= \lim_{x \rightarrow -1} \frac{(x-4)(\cancel{x+1})}{(\cancel{x+1})} \\ &= \lim_{x \rightarrow -1} (x-4) = -1-4 = \boxed{-5} \end{aligned}$$

2. Use the following function to answer the following questions.

$$f(x) = \begin{cases} 5-x, & x < 4 \\ \frac{x}{2}, & x > 4 \end{cases}$$

- (a) Find $\lim_{x \rightarrow 4^+} f(x)$, (b) $\lim_{x \rightarrow 4^-} f(x)$, (c) $\lim_{x \rightarrow 4} f(x)$

$$(a) \lim_{x \rightarrow 4^+} f(x) = \lim_{x \rightarrow 4^+} \frac{x}{2} = \frac{4}{2} = \boxed{2}$$

$$(b) \lim_{x \rightarrow 4^-} f(x) = \lim_{x \rightarrow 4^-} (5-x) = 5-4 = \boxed{1}$$

$$(c) \lim_{x \rightarrow 4^+} f(x) \neq \lim_{x \rightarrow 4^-} f(x), \text{ Hence } \lim_{x \rightarrow 4} f(x) \text{ does not exist.}$$