

# SOLUTIONS

Calculus I, Fall 2014

Quiz 2

Name: \_\_\_\_\_

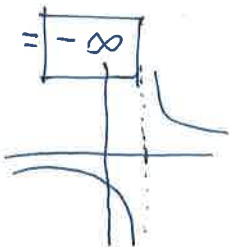
You must show all your work to receive credit. Calculators are allowed.

Find the following limits, if they exist. Write DNE if they do not exist. For this problem, allow  $\infty$  and  $-\infty$  as possible answers (for example, if the limit is  $\infty$  write  $\infty$  instead of DNE). 2 points each.

1.  $\lim_{x \rightarrow 1/3} (x^2 + 4) = \boxed{4.1111\dots = 4 + \frac{1}{9} = 37/9}$

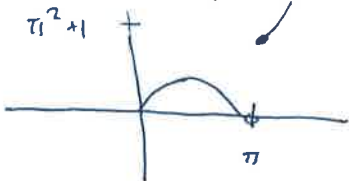
x	.3	.4	.33	.34	.333333
$x^2 + 4$	4.09	4.16	4.1089	4.1156	4.11110889

2.  $\lim_{x \rightarrow 1^-} \frac{x+2}{x-1} = \boxed{-\infty}$



$\frac{x+2}{x-1} \approx \frac{3}{\text{small neg. \#}} = \text{very large neg. \#}$   
when  $x \rightarrow 1^-$

3. Let  $f(x) = \begin{cases} \sin x, & x < \pi \\ x^2 + 1, & x \geq \pi \end{cases}$ . Find  $\lim_{x \rightarrow \pi^+} f(x) = \boxed{\pi^2 + 1}$



4.  $\lim_{x \rightarrow 0} \frac{x}{|x|} = \boxed{\text{DNE}}$

when  $x < 0$ ,  $\frac{x}{|x|} = -1$ , when  $x > 0$ ,  $\frac{x}{|x|} = +1$

5.  $\lim_{x \rightarrow -3} (x+3)^{-2} = \boxed{\infty}$

when  $x \rightarrow -3$ ,  $(x+3)^{-2} = \frac{1}{(x+3)^2} = \frac{1}{\text{small pos. \#}} = \text{large pos. \#}$