

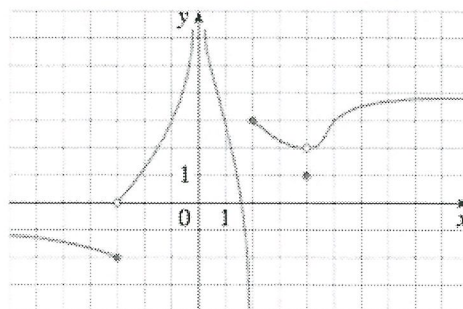
Name: Key

Math 151-01 Calculus I – Crawford

Quiz 1-A

12 September 2017

Books, notes (in any form), and calculators are not allowed. *Show all your work.* Good Luck!



1. (5 pts) Given the graph of $f(x)$ above, state the value of each quantity below, if it exists. Clearly indicate $+\infty$ or $-\infty$ in the case of an infinite limit. If the quantity does not exist, state DNE.

(a). $\lim_{x \rightarrow -3^+} f(x) = \boxed{0}$

(b). $\lim_{x \rightarrow 0} f(x) = \boxed{+\infty}$

(c). $\lim_{x \rightarrow 4} f(x) = \boxed{2}$

(d). $f(4) = \boxed{1}$

2. (5 pts) Evaluate the following limit, if it exists. Clearly indicate $+\infty$ or $-\infty$ in the case of an infinite limit. If the limit does not exist, clearly explain the reason why.

$$\lim_{x \rightarrow -2} \frac{x^2 + 4x + 4}{x^2 - 4} = \lim_{x \rightarrow -2} \frac{(x+2)^2}{(x+2)(x-2)} = \lim_{x \rightarrow -2} \frac{x+2}{x-2} = \frac{-2+2}{-2-2} = \frac{0}{-4} = 0$$

Ind. Form

$\Rightarrow$ More Work

3. (5 pts) Evaluate the following limit, if it exists. Clearly indicate $+\infty$ or $-\infty$ in the case of an infinite limit. If the limit does not exist, clearly explain the reason why.

$$\lim_{x \rightarrow 3} \frac{x^2 + 1}{x - 3}$$

$$\frac{(3)^2 + 1}{3 - 3} = \frac{10}{0}$$

$$\frac{\text{nonzero \#}}{0}$$

$\Rightarrow$ Infinite Limit

$\Rightarrow$ Check one-sided limits

① $\lim_{x \rightarrow 3^+} \frac{x^2 + 1}{x - 3} = +\infty$
eg 3.1

$$\frac{(+)}{(+)} \rightarrow (+)$$

② $\lim_{x \rightarrow 3^-} \frac{x^2 + 1}{x - 3} = -\infty$
eg 2.9

$$\frac{(+)}{(-)} \rightarrow (-)$$

One-sided limits are different. Therefore $\lim_{x \rightarrow 3} \frac{x^2 + 1}{x - 3} \text{ DNE}$