

Name: _____

Math 151-01 Calculus I – Crawford

Quiz 1-B

12 September 2017

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

1. (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.

$$\lim_{x \rightarrow -2} \frac{x^2 - 2x - 8}{x^2 - 4} = \lim_{x \rightarrow -2} \frac{(x-4)\cancel{(x+2)}}{(x-2)\cancel{(x+2)}} = \lim_{x \rightarrow -2} \frac{x-4}{x-2} = \frac{-2-4}{-2-2}$$

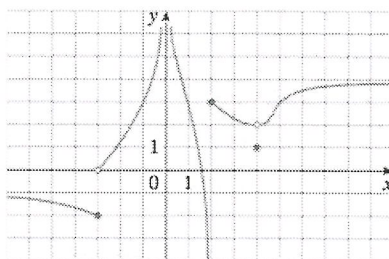
$$\frac{(-2)^2 - 2(-2) - 8}{(-2)^2 - 4}$$

$$\frac{4 + 4 - 8}{4 - 4}$$

$\frac{0}{0}$ Ind. Form
 $\Rightarrow$ More Work

$$= \frac{-6}{-4}$$

$$= \boxed{\frac{3}{2}}$$



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

(b). $\lim_{x \rightarrow 2^-} f(x) = \boxed{-\infty}$

(c). $\lim_{x \rightarrow 2^+} f(x) = \boxed{3}$

(d). $\lim_{x \rightarrow -3} f(x) = \boxed{\text{DNE}}$

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.

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

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

Infinite Limit

$\Rightarrow$ Check one-sided limits

$$\textcircled{1} \lim_{x \rightarrow 3^-} \frac{1-x}{(x-3)^2} = -\infty$$

eg $x=2.9$

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

$$\textcircled{2} \lim_{x \rightarrow 3^+} \frac{1-x}{(x-3)^2} = -\infty$$

eg $x=3.1$

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

Same

$$\boxed{\lim_{x \rightarrow 3} \frac{1-x}{(x-3)^2} = -\infty}$$