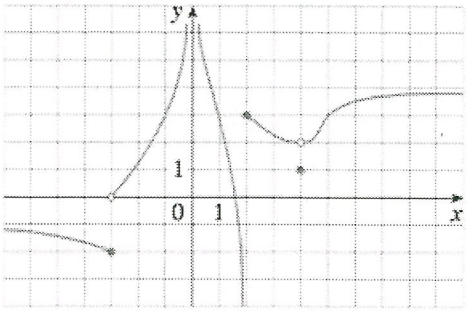
Name: Key

Math 151-02 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). $\lim_{x \to 2^+} f(x) = \boxed{3}$

(b). $f(-3) = \boxed{-2}$

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

(d). $\lim_{x \to 0} f(x) = \boxed{+\infty}$

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.

$$\lim_{x\to -3} \frac{3x^2+9x}{x^2-9} = \lim_{x\to -3} \frac{3x(x+3)}{(x+3)(x-3)} = \lim_{x\to -3} \frac{3x}{x-3}$$

$$\frac{3(-3)^2+9(-3)}{(-3)^2-9}$$

$$\frac{27-27}{9-9}$$

$$\frac{0}{0}$$

Ind. Form

$$= \frac{3(-3)}{-3-3}$$

$$= \frac{-9}{-6}$$

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

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.

$$\lim_{h\to 0} \frac{\sqrt{4+h}-2}{h} \cdot \frac{\sqrt{4+h}+2}{\sqrt{4+h}+2} = \lim_{h\to 0} \frac{(\sqrt{4+h})^2-(2)^2}{h(\sqrt{4+h}+2)}$$

$$\frac{\sqrt{4}-2}{0}$$

$$\frac{2-2}{0}$$

$$\frac{0}{0}$$

Ind. Form

$$= \lim_{h\to 0} \frac{4+h-4}{h(\sqrt{4+h}+2)}$$

$$= \lim_{h\to 0} \frac{h}{h(\sqrt{4+h}+2)}$$

$$= \lim_{h\to 0} \frac{1}{\sqrt{4+h}+2}$$

$$= \frac{1}{\sqrt{4}+2} = \frac{1}{2+2} = \boxed{\frac{1}{4}}$$