Quiz 3

Name: Sols

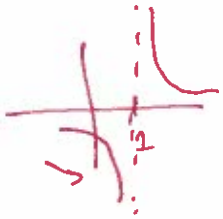
1. [6 pts] Evaluate each of the following limits exactly (without guessing), or explain why the indicated limit does not exist.

(a) $\lim_{x\to 4^-} \frac{|x|}{x}$ $= \frac{|4|}{4} = 1$

(c) $\lim_{r\to -2} \frac{1}{(r-2)^2}$ $= \frac{1}{(-2-2)^2} = \frac{1}{16}$

(b) $\lim_{x\to 1^-} \frac{1}{x-1}$

$= -\infty$



(d) $\lim_{t\to 0} \frac{1}{x}$

Does not exist;

$\lim_{x\to 0^-} \frac{1}{x} = -\infty$,

$\lim_{x\to 0^+} \frac{1}{x} = +\infty$.

2. [4 pts] Let $g(x) = 14x - 8$. Using the limit definition of the derivative, calculate $f'(-3)$ exactly.

$$f'(-3) = \lim_{h\to 0} \frac{f(-3+h) - f(-3)}{h} = \lim_{h\to 0} \frac{14(-3+h) - 8 - (14(-3) - 8)}{h}$$

$$= \lim_{h\to 0} \frac{14(-3) + 14h - 8 - 14(-3) + 8}{h}$$

$$= \lim_{h\to 0} \frac{14h}{h} = \lim_{h\to 0} 14 = \boxed{14}$$