MATH 1101Y 2009 Quiz 2 (b)

1. (2 pts) Determine the infinite limit

$$\lim_{x\to 1^-} \frac{x+1}{x^2-4x+3}.$$

*Solution*:

$$\lim_{x\to 1^-} \frac{x+1}{x^2-4x+3} = \lim_{x\to 1^-} \frac{x+1}{(x-1)(x-3)} = \infty.$$

□

2. (2 pts) Evaluate the limit, if it exists.

$$\lim_{h\to -3} \frac{\frac{1}{3}+\frac{1}{h}}{3+h}.$$

*Solution*:

$$\begin{aligned}\lim_{h\to -3} \frac{\frac{1}{3}+\frac{1}{h}}{3+h} &= \lim_{h\to -3} \frac{\frac{h+3}{3h}}{3+h} \\ &= \lim_{h\to -3} \frac{\frac{1}{3h}}{1} = -\frac{1}{9}.\end{aligned}$$

□

3. (1 pt) Evaluate the limit, if it exists.

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

*Solution*:

$$\begin{aligned}\lim_{x\to 1} \frac{x^2+2x-3}{x-1} &= \lim_{x\to 1} \frac{(x+3)(x-1)}{x-1} \\ &= \lim_{x\to 1} (x+3) = 4.\end{aligned}$$

□