

MATH 101
QUIZ # 1

NAME: SEC. #:

ID #:

Q1. Find

$$\begin{aligned}\lim_{x \rightarrow 3} \frac{x^2 - 9}{2x^2 - 7x + 3} &= \\ &= \lim_{x \rightarrow 3} \frac{(x-3)(x+3)}{(x-3)(2x-1)} \\ &= \frac{6}{5}\end{aligned}$$

Q2. Let $f(x) = \begin{cases} 1 - x^2 & \text{if } x \leq 1 \\ x - 1 & \text{if } x > 1 \end{cases}$

Does $\lim_{x \rightarrow 1} f(x)$ exist? If so, what is the limit
Yes

$$\begin{aligned}\lim_{x \rightarrow 1^-} 1 - x^2 &= 0 \\ \lim_{x \rightarrow 1^+} x - 1 &= 0 \\ \implies \lim_{x \rightarrow 1} f(x) &= 0\end{aligned}$$

Q3. Find

$$\begin{aligned}\lim_{x \rightarrow 0} \frac{x}{\sqrt{x+4} - 2} &= \\ &= \lim_{x \rightarrow 0} \frac{x}{\sqrt{x+4} - 2} \cdot \frac{\sqrt{x+4} + 2}{\sqrt{x+4} + 2} \\ &= \lim_{x \rightarrow 0} \frac{x(\sqrt{x+4} + 2)}{x + 4 - 4} \\ &= \lim_{x \rightarrow 0} \sqrt{x+4} + 2 = 4\end{aligned}$$