Math 131 - Quiz 2

Name _____

January 27, 2021

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due on February 3.

---

1. (6 points) Evaluate each limit analytically. Do not use a calculator.

   (a) $\lim_{x \to 4} \dfrac{(x^2 - 3x - 4)^2}{x - 4}$

   (b) $\lim_{\theta \to \pi/3} \dfrac{4 \sin 2\theta}{5\theta}$

   (c) $\lim_{x \to 3} \dfrac{3x - 9}{\sqrt{3x} - 3}$

   (d) $\lim_{u \to -4} \left(\dfrac{4u}{2u + 8} + \dfrac{8}{u + 4} \right)$

Turn over.

2. (2 points) Consider the following limit: $\lim_{x \to 5} \dfrac{x^2 - 10x + 20}{(x-5)^2}$

   (a) Explain why the limit laws cannot be used to determine the limit.

   (b) The actual limit fails to exist. In which of the four common ways does it fail to exist? Justify your reasoning.

3. (2 points) Evaluate each limit analytically. DO NOT USE A CALCULATOR.

   (a) $\lim_{x \to 1^+} (5x^2 - x + \sqrt{4x})$

   (b) $\lim_{y \to 4^-} \dfrac{4y - y^2}{|y - 4|}$