Math 131 - Quiz 3

Name _____

January 30, 2023

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (3 points) For each part of this problem, assume that $\lim_{x\to 2} f(x) = 3$, $\lim_{x\to 2} g(x) = 7$, and $\lim_{x\to 2} h(x)$ exists.

   (a) Find $\lim_{x\to 2} h(x)$ if $\lim_{x\to 2} \dfrac{g(x)}{h(x)} = \dfrac{1}{2}$.

   (b) Find $\lim_{x\to 2} h(x)$ if $\lim_{x\to 2} \dfrac{f(x)}{h(x)}$ does not exist.

2. (3 points) Explain why direct substitution cannot be used to evaluate the limit. Then use a different approach to find the limit.

$$\lim_{x\to 5} \left(\frac{x^2 - 3x - 10}{x^2 + x - 30} \right)$$

Turn over.

3. (2 points) Evaluate the limit: $\lim_{y \to 2} \dfrac{2y - 4}{\sqrt{y} - \sqrt{2}}$

4. (2 points) Evaluate $\lim_{x \to 2^-} f(x)$, where $f(x) = \begin{cases} 2x^3 + \cos(\pi x), & -3 \leq x < 2 \\ x \sin(x), & x > 2 \end{cases}$