

Math 131 - Quiz 3

February 1, 2023

Name _____

Score _____

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

1. (2.5 points) Explain why direct substitution cannot be used to evaluate the limit. Then use a different approach to find the limit.

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

2. (2.5 points) Evaluate the limit: $\lim_{y \rightarrow 2} \frac{2y - 4}{\sqrt{y} - \sqrt{2}}$

Turn over.

3. (1 point) Evaluate $\lim_{x \rightarrow 2^-} f(x)$, where $f(x) = \begin{cases} 2x^3 + \cos(\pi x), & -3 \leq x < 2 \\ x \sin(x), & x > 2 \end{cases}$

4. (4 points) For each problem below, determine analytically whether the limit is $+\infty$, $-\infty$, or DNE. Show work or explain your reasoning.

(a) $\lim_{x \rightarrow 7^-} \left(\frac{3 - x}{x - 7} \right)$

(b) $\lim_{x \rightarrow 4} \frac{2x + 4}{(x - 4)^2}$