Math 131 - Quiz 4

February 18, 2026

Name _____

Score _____

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

1. (6 points) Find and classify (removable, infinite, or jump) each discontinuity. Your work must show how you are using limits.

$$f(x) = \begin{cases} x^2 + 2x + 3, & x < 1 \\ x^3 + 5, & 1 \le x < 2 \\ 6x + \cos(\pi x), & 2 < x \le 4 \\ x + 8\sqrt{x}, & x > 4 \end{cases}$$

2. (2 points) Let $f(x) = x^5 - 6x + 3$. Use the intermediate value theorem to identify an interval, $[a, b]$, on which $f(x) = 0$ has a solution. Explain your reasoning.

3. (2 point) Carefully state the limit definition of the derivative.