Engineering Calculus I - MAC 2281 - Section 002

QUIZ III

First Name: Last Name:

1. (5 points)

State the Intermediate Value Theorem.

Suppose that f is continuous on the closed interval $[a, b]$
and let N be any number between $f(a)$ and $f(b)$, where $f(a) \neq f(b)$.
Then there exists a number c in (a, b) such that $f(c) = N$.

2. (5 points)

Sketch the graph of a function f that satisfies **all** the following conditions:

- $f(x) \to 5$ as $x \to -\infty$,
- $\lim_{x \to 1^+} f(x) = +\infty$,
- $f(1) = 0$,
- $f(2) = 1$,
- $\lim_{x \to -3} f(x) = -4$,
- f is not continuous at $x = -3$,
- $\lim_{x \to +\infty} f(x) = 0$,
- $f(x)$ is defined for every x.

Make sure that your graph is the graph of a function, i.e., that it passes the vertical line test.