Definitions and Theorems - Test 1

☺ Continuity

A function is *continuous* at a number a if $\lim_{x \to a} f(x) = f(a)$.

😄 Derivative of a Function

Let $f(x)$ be a function. The *derivative* of f is the function $f'(x)$ defined as:

$$f'(x) = \lim_{h \to 0} \frac{f(x+h) - f(x)}{h}.$$

😎 Squeeze Theorem

Let f, g, h be functions defined near a (except possibly at a). Suppose that:

1) $g(x) \leq f(x) \leq h(x)$ for all x near a (except possibly at a);
2) $\lim_{x \to a} g(x) = \lim_{x \to a} h(x) = L$.

Then

$$\lim_{x \to a} f(x) = L.$$

😇 Intermediate Value Theorem

Let f be a continuous function on a closed interval $[a, b]$, with $f(a) \neq f(b)$. Let N be any number between $f(a)$ and $f(b)$.

Then there exists c in (a, b) such that $f(c) = N$.