

Functions that differ at a point

Suppose $f(x) = g(x)$ for all $x \neq c$ on an open interval containing c . If $\lim_{x \rightarrow c} g(x)$ exists, then $\lim_{x \rightarrow c} f(x)$ also exists and

$$\lim_{x \rightarrow c} f(x) = \lim_{x \rightarrow c} g(x).$$

Squeeze Theorem

Suppose f , g , and h are functions for which

$$g(x) \leq f(x) \leq h(x)$$

for all x in an open interval containing c , except possibly at c . If

$$\lim_{x \rightarrow c} g(x) = L \quad \text{and} \quad \lim_{x \rightarrow c} h(x) = L,$$

then f must have the same limit at c :

$$\lim_{x \rightarrow c} f(x) = L.$$

Common ways to resolve 0/0 forms

1. Factor and cancel
2. Expand and simplify
3. Multiply by the conjugate and simplify
4. Get a common denominator and add (or subtract)
5. Use $\lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$
6. Use the definition of absolute value