

Difference Quotient of $f(x)$

This produces the derivative of x .

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

Alternative Version

This allows you to calculate the value of $f'(c)$:

$$f'(c) = \lim_{x \rightarrow c} \frac{f(x) - f(c)}{x - c}$$

L'Hôpital's Rule

Consider the function

$$f(x) = \frac{g(x)}{h(x)}$$

If $\lim_{h \rightarrow c} g(x)$ and $\lim_{h \rightarrow c} h(x)$ are both 0 or are both $\pm\infty$, then

$$\lim_{h \rightarrow c} f(x) = \lim_{h \rightarrow c} \frac{g'(x)}{h'(x)}$$