

LIMIT LAWS

Let $f(x)$, $g(x)$ be functions. Assume that $\lim_{x \rightarrow c} f(x)$ and $\lim_{x \rightarrow c} g(x)$ both exist.

$$(LL1) \lim_{x \rightarrow c} bf(x) = b \left(\lim_{x \rightarrow c} f(x) \right), \text{ for any constant } b.$$

$$(LL2) \lim_{x \rightarrow c} f(x) \pm g(x) = \lim_{x \rightarrow c} f(x) \pm \lim_{x \rightarrow c} g(x)$$

$$(LL3) \lim_{x \rightarrow c} f(x)g(x) = \left(\lim_{x \rightarrow c} f(x) \right) \left(\lim_{x \rightarrow c} g(x) \right)$$

$$(LL4) \lim_{x \rightarrow c} \frac{f(x)}{g(x)} = \frac{\lim_{x \rightarrow c} f(x)}{\lim_{x \rightarrow c} g(x)}, \text{ provided } \lim_{x \rightarrow c} g(x) \neq 0.$$

$$(LL5) \text{ For any constant } k, \lim_{x \rightarrow c} k = k.$$

$$(LL6) \lim_{x \rightarrow c} x = c.$$