

1 Limit Laws

1.1 Addition Law

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

provided both $\lim_{x \rightarrow c} f(x)$ and $\lim_{x \rightarrow c} g(x)$ exist.

1.2 Subtraction Law

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

provided both $\lim_{x \rightarrow c} f(x)$ and $\lim_{x \rightarrow c} g(x)$ exist.

1.3 Multiplication Law

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

provided both $\lim_{x \rightarrow c} f(x)$ and $\lim_{x \rightarrow c} g(x)$ exist.

1.4 Division Law

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

provided both limits on the right exist, and $\lim_{x \rightarrow c} g(x) \neq 0$.

1.5 Logarithm Technique

If

$$\lim_{x \rightarrow c} \ln f(x) = a,$$

then

$$\lim_{x \rightarrow c} f(x) = e^a.$$