The Limit Laws

If \( \lim_{x \to a} f(x) = L \) and \( \lim_{x \to a} g(x) = M \) both exist then

The Sum Law

\[
\lim_{x \to a} [f(x) + g(x)] = L + M.
\]

The Difference Law

\[
\lim_{x \to a} [f(x) - g(x)] = L - M.
\]

The Constant Multiple Law

\[
\lim_{x \to a} [cf(x)] = cM.
\]

The Product Law

\[
\lim_{x \to a} [f(x) \cdot g(x)] = L \cdot M.
\]

The Quotient Law

\[
\lim_{x \to a} \frac{f(x)}{g(x)} = \frac{L}{M}.
\]

The Power Law (where \( n \) is a positive integer)

\[
\lim_{x \to a} [f(x)]^{n} = L^{n}.
\]

The Root Law (where \( n \) is a positive integer)

\[
\lim_{x \to a} \sqrt[n]{f(x)} = \sqrt[n]{L}.
\]