THEOREM. Limit Laws

1. Sum or Difference
$$\lim_{x \to a} [f(x) \pm g(x)] = \lim_{x \to a} f(x) \pm \lim_{x \to a} g(x)$$

   $\Rightarrow$ We can break up a limit

2. Constant/Scalar Multiple
$$\lim_{x \to a} c \cdot f(x) = c \cdot \lim_{x \to a} f(x)$$

   $\Rightarrow$ We can move the constant out of the limit

3. Product
$$\lim_{x \to a} f(x) \cdot g(x) = \lim_{x \to a} f(x) \cdot \lim_{x \to a} g(x)$$

   $\Rightarrow$ Find limit of each function separately, then multiply

4. Quotient
$$\lim_{x \to a} \frac{f(x)}{g(x)} = \frac{\lim_{x \to a} f(x)}{\lim_{x \to a} g(x)}$$

   only if $\lim_{x \to a} g(x) \neq 0$

   $\Rightarrow$ Find limit of each function, then divide

5. Power
$$\lim_{x \to a} [f(x)]^n = \left[\lim_{x \to a} f(x) \right]^n$$

   $\Rightarrow$ Find limit, then raise to the power

6. Fractional Power/Radical

$$\lim_{x \to a} [f(x)]^{n/m} = \left[\lim_{x \to a} f(x) \right]^{n/m}$$