

Lecture 7

Monday, October 10, 2022 7:51 AM

Limit laws:

- * Plug in (for continuous function)
- * Addition law
- * Multiplication/quotient law
- * Composition law

$$\text{If } \lim_{x \rightarrow a} f(x) = b, \quad \lim_{x \rightarrow b} g(x) = c$$

$$\text{then } \lim_{x \rightarrow a} f(g(x)) = c$$

$$\text{Ex } \lim_{x \rightarrow 0} \cos^4 x$$

$$x \xrightarrow[\text{g}]{\text{cosine}} \cos x \xrightarrow[\text{f}]{^4} \cos^4 x$$

$$\text{As } x \rightarrow 0, \quad \cos x \rightarrow \cos 0 = 1, \quad \cos^4 x \rightarrow \cos^4 0 = 1^4 = 1.$$

* Squeeze theorem

$$\text{If } f(x) \leq g(x) \quad \forall x$$

$$\text{then } \lim_{x \rightarrow a} f(x) \leq \lim_{x \rightarrow a} g(x)$$