

1.3 Limits

Properties:

$$1) \lim_{x \rightarrow a} [cf(x)] = c \cdot \lim_{x \rightarrow a} f(x)$$

$$2) \lim_{x \rightarrow a} [f(x) \pm g(x)] = \lim_{x \rightarrow a} f(x) \pm \lim_{x \rightarrow a} g(x)$$

$$3) \lim_{x \rightarrow a} [f(x) \cdot g(x)] = \lim_{x \rightarrow a} f(x) \cdot \lim_{x \rightarrow a} g(x)$$

$$4) \lim_{x \rightarrow a} \left[\frac{f(x)}{g(x)} \right] = \lim_{x \rightarrow a} f(x) \div \lim_{x \rightarrow a} g(x)$$

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

Ex) Given $\lim_{x \rightarrow c} f(x) = \frac{3}{2}$ $\lim_{x \rightarrow c} g(x) = \frac{1}{2}$

$$a) \lim_{x \rightarrow c} [4f(x)] = 4 \cdot \frac{3}{2} = \boxed{6}$$

$$b) \lim_{x \rightarrow c} [f(x) \cdot g(x)] = \boxed{\frac{3}{4}}$$

$$c) \lim_{x \rightarrow c} [f(x) + g(x)] = \frac{3}{2} + \frac{1}{2} = \boxed{2}$$

$$d) \lim_{x \rightarrow c} \frac{f(x)}{g(x)} = \frac{\frac{3}{2}}{\frac{1}{2}} = \boxed{3}$$