

## Derivate

$$D k = 0$$

$$D x = 1$$

$$D \sin x = \cos x$$

$$D \cos x = -\sin x$$

$$D \tan x = \frac{1}{\cos^2 x} = 1 + \tan^2 x$$

$$D \cot x = -\frac{1}{\sin^2 x} = -(1 + \cot^2 x)$$

$$D \arcsin x = \frac{1}{\sqrt{1-x^2}}$$

$$D \arccos x = -\frac{1}{\sqrt{1-x^2}}$$

$$D \arctan x = \frac{1}{1+x^2}$$

$$D \operatorname{arc cot} x = -\frac{1}{1+x^2}$$

$$D e^x = e^x$$

$$D a^x = a^x \ln a$$

$$D \ln x = \frac{1}{x}$$

$$D \log_a x = \frac{1}{x} \cdot \log_a e$$

## Derivate di funzioni

$$D f(x) \cdot g(x) = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

$$D \frac{f(x)}{g(x)} = \frac{f'(x) \cdot g(x) - f(x) \cdot g'(x)}{[g(x)]^2}$$

$$D [f(x)]^n = n[f(x)]^{n-1} \cdot f'(x)$$

$$D e^{f(x)} = e^{f(x)} \cdot f'(x)$$

$$D \ln f(x) = \frac{1}{f(x)} \cdot f'(x)$$

$$D \sin f(x) = \cos f(x) \cdot f'(x)$$

$$D \cos f(x) = -\sin f(x) \cdot f'(x)$$

$$D \tan f(x) = \frac{1}{\cos^2 f(x)} \cdot f'(x)$$

$$D \cot f(x) = \frac{1}{\sin^2 f(x)} \cdot f'(x)$$

$$D \arcsin f(x) = \frac{1}{\sqrt{1-[f(x)]^2}} \cdot f'(x)$$

$$D \arccos f(x) = -\frac{1}{\sqrt{1-[f(x)]^2}} \cdot f'(x)$$

$$D \arctan f(x) = \frac{1}{1+[f(x)]^2} \cdot f'(x)$$

$$D \operatorname{arc cot} f(x) = -\frac{1}{1+[f(x)]^2} \cdot f'(x)$$

$$D [f(x)]^{g(x)} = D e^{g(x) \ln f(x)}$$

$$D \frac{1}{f(x)} = \frac{f'(x)}{[f(x)]^2}$$

### *Rapporto incrementale*

$$\lim_{x \rightarrow x_0} \frac{f(x) - f(x_0)}{x - x_0} = \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}$$