

RAMK

Tekniikka ja liikenne

Tekniikan matemaattiset apuneuvot/ menetelmät 2

## Derivointikaavat

$$1. f'(x) = \lim_{\Delta x \rightarrow 0} \frac{f(x + \Delta x) - f(x)}{\Delta x}$$

$$2. \frac{d}{dx}[c f(x)] = c f'(x)$$

$$3. \frac{d}{dx}[f(x) + g(x)] = f'(x) + g'(x)$$

$$4. \frac{d}{dx}[f(x)g(x)] = f'(x)g(x) + f(x)g'(x)$$

$$5. \frac{d}{dx} \frac{f(x)}{g(x)} = \frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$$

$$6. \frac{d}{dx} f(g(x)) = f'(g(x))g'(x)$$

$$7. \frac{d}{dx} x^r = r x^{r-1}$$

$$8. \frac{d}{dx} \sin x = \cos x$$

$$9. \frac{d}{dx} \cos x = -\sin x$$

$$10. \frac{d}{dx} e^x = e^x$$

$$11. \frac{d}{dx} \ln x = \frac{1}{x}$$

**Derivointikaavat**

Täydennä puuttuvat kohdat.

1.  $f'(x) = \lim_{\Delta x \rightarrow 0}$

2.  $\frac{d}{dx}[c f(x)] =$

3.  $\frac{d}{dx}[f(x) + g(x)] =$

4.  $\frac{d}{dx}[f(x)g(x)] =$

5.  $\frac{d}{dx} \frac{f(x)}{g(x)} =$

6.  $\frac{d}{dx} f(g(x)) =$

7.  $\frac{d}{dx} x^r =$

8.  $\frac{d}{dx} \sin x =$

9.  $\frac{d}{dx} \cos x =$

10.  $\frac{d}{dx} e^x =$

11.  $\frac{d}{dx} \ln x =$