

Derivatan av $\sin x$

$$f(x) = \sin x$$

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

$$\frac{f(x+h) - f(x)}{h} = \frac{\sin(x+h) - \sin x}{h} =$$

$$= \frac{\sin x \cdot \cos h + \cos x \cdot \sin h - \sin x}{h} =$$

$$= \sin x \left(\frac{\cos h - 1}{h} \right) + \cos x \cdot \frac{\sin h}{h}$$

$$f'(x) = \lim_{h \rightarrow 0} \sin x \cdot \left(\frac{\cos h - 1}{h} \right) + \cos x \cdot \frac{\sin h}{h} =$$

$$= \sin x \cdot 0 + \cos x \cdot 1 = \cos x$$

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