DE PRODUCT REGEL

te bewijzen:

$$p(x) = f(x) \cdot g(x) \to p'(x) = f'(x) \cdot g(x) + f(x) \cdot g'(x)$$

bewijs:

Stel $p(x) = f(x) \cdot g(x)$

$\frac{\triangle p}{\triangle x} = \frac{p(x+h)-p(x)}{h} = \frac{f(x+h)\cdot g(x+h)-f(x)\cdot g(x)}{h} =$

$\frac{f(x+h)\cdot g(x+h)-f(x)\cdot g(x) \qquad +f(x)\cdot g(x+h)-f(x)\cdot g(x+h)}{h} =$

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

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

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

$g(x+h) \cdot \frac{f(x+h)-f(x)}{h} + f(x) \cdot \frac{g(x+h)-g(x)}{h}$

$\lim_{h\to 0} \left(g(x+h) \cdot \frac{f(x+h)-f(x)}{h} + f(x) \cdot \frac{g(x+h)-g(x)}{h}\right) = g(x) \cdot f'(x) + f(x) \cdot g'(x) = p'(x)$