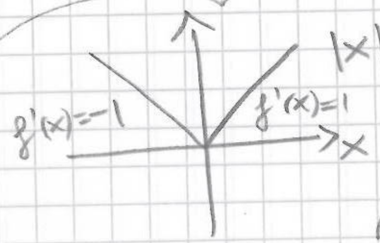
Sek. 6.1

$$= x^x \left(1\cdot \ln|x| + x\,\frac{1}{|x|}\,\underbrace{D[|x|]}\right)$$

$\boxed{\text{prod. regel}}$

Denne er ± 1 avh. av $x > 0$ el. < 0.



Men $|x| = \begin{cases} x, & x \geq 0 \\ -x, & x < 0 \end{cases}$

$\Rightarrow$ "opphever" hverandre:

$$\frac{1}{|x|}\,D[|x|] = \frac{1}{x}$$

$$= x^x\left(\ln|x| + \frac{x}{x}\right) = x^x\left(\underline{\underline{\ln|x| + 1}}\right)$$

13.) $f(x) = \begin{cases} \dfrac{1-\cos x}{x}, & x > 0 \\ x^2, & x \leq 0 \end{cases}$

Er f deriverbar i 0?

$$\lim_{x \to 0^+} \frac{f(x) - f(0)}{x - 0} = \lim_{h \to 0^+} \frac{\frac{1-\cos x}{x} - 0}{x}$$

$$= \lim_{x \to 0^+} \frac{1 - \cos x}{x^2} = \frac{1}{2}$$

Se oppg. 5.4.9) e) iii)

$$\lim_{x \to 0^-} \frac{f(x) - f(0)}{x - 0} = \lim_{x \to 0^-} \frac{x^2 - 0}{x} = \lim_{x \to 0} x = 0$$

Men $\displaystyle\lim_{x \to 0^+} \frac{f(x) - f(0)}{x - 0} = \frac{1}{2} \neq 0 = \lim_{x \to 0^-} \frac{f(x) - f(0)}{x - 0}$

så f er ikke deriverbar i 0.