

(Ex 8)

$$\sigma'(y) = \sigma(y)(1 - \sigma(y))$$

$$\sigma(y) = 1 / (1 + e^{-y})$$

$$\frac{d\sigma}{dy} = \left((1 + e^{-y})^{-1} \right)' = (1 + e^{-y})^{-2} \cdot e^{-y} =$$

$$= \frac{1}{(1 + e^{-y})^2} \cdot e^{-y} =$$

$$= \frac{1}{1 + e^{-y}} \cdot \frac{1}{1 + e^{-y}} \cdot e^{-y} =$$

$$= \frac{1}{1 + e^{-y}} \cdot \frac{e^{-y} + 1 - 1}{1 + e^{-y}} =$$

$$= \frac{1}{1 + e^{-y}} \cdot \left(\frac{1 + e^{-y}}{1 + e^{-y}} - \frac{1}{1 + e^{-y}} \right) =$$

$$= \sigma(y) \cdot (1 - \sigma(y))$$