

$$21.16 \quad (=) \ln e^{2x} = \ln \frac{3}{2} \quad (=) 2x = \ln \frac{3}{2} \quad | :2 \quad (=) x = \frac{\ln \frac{3}{2}}{2}$$

$$y = f\left(\frac{\ln \frac{3}{2}}{2}\right) = e^{2 \cdot \frac{\ln \frac{3}{2}}{2}} - \frac{\ln \frac{3}{2}}{2} = e^{\ln \frac{3}{2}} - \frac{\ln \frac{3}{2}}{2} = \frac{3}{2} - \frac{\ln \frac{3}{2}}{2}$$

Wert:  $\left(\frac{\ln \frac{3}{2}}{2}, \frac{3}{2} - \frac{\ln \frac{3}{2}}{2}\right)$

$$\log a^x = x \log a$$

$$\log(a \cdot b) = \log a + \log b$$

$$\log \frac{a}{b} = \log a - \log b$$

$$21.17 \quad a) \ln 6 - 2 \ln 3 + \ln \frac{1}{2}$$

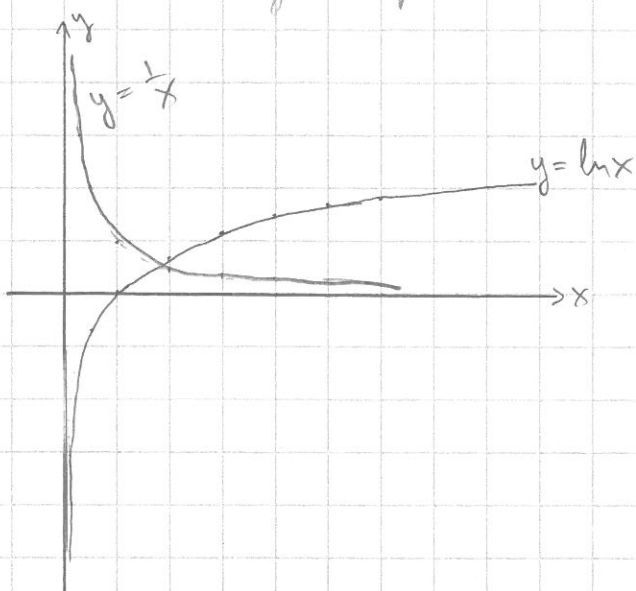
$$= \ln 6 - \ln \frac{3^2}{9} + \ln \frac{1}{2}$$

$$= \ln \frac{6}{9} + \ln \frac{1}{2} = \ln\left(\frac{6}{9} \cdot \frac{1}{2}\right) = \ln \frac{1}{3} = \underbrace{\ln 1}_{=0} - \ln 3 = \underline{\underline{-\ln 3}}$$

$$b) \ln e^3 + \ln \frac{1}{e} = 3 + \underbrace{\ln 1}_{=0} - \underbrace{\ln e}_{=1} = 3 - 1 = \underline{\underline{2}}$$

$$c) \ln \frac{x+1}{x} + \ln x = \ln(x+1) - \ln x + \ln x = \underline{\underline{\ln(x+1)}}, x > 0$$

## 22. Logarithmifunktion derivative



$$e^{\ln x} = x \quad | D, x > 0$$

$$(\Rightarrow) \underbrace{e^{\ln x}}_x \cdot D \ln x = 1 \quad | :x$$

$$(\Rightarrow) \boxed{D \ln x = \frac{1}{x}}$$

Exm. a)  $D(x^2 \cdot \ln x) = 2x \ln x + x^2 \cdot \frac{1}{x} = 2x \ln x + x$

b)  $D(\ln x)^2 = 2(\ln x)^1 \cdot \underbrace{\frac{1}{x}}_{D \ln x} = 2 \ln x \cdot \frac{1}{x}$

c)  $D \ln(6x) = \frac{1}{6x} \cdot \underbrace{6}_{D(6x)} = \frac{1}{x}$  「  $D \ln(6x) = D(\ln 6 + \ln x) = \frac{1}{x}$  」

d)  $D \lg x = D \frac{\ln x}{\ln 10} = \frac{1}{\ln 10} \cdot D \ln x = \frac{1}{\ln 10} \cdot \frac{1}{x} = \frac{1}{x \ln 10}$   
 ( $\lg x = \log_{10} x$ )