$$a^x = b \Leftrightarrow x = \log_a b = \frac{\log b}{\log a}$$

$3^x = 243$ $\qquad$ $x = \log_3 243$

$3^x = 3^5$ $\qquad$ $x = 5$

naturalis $\qquad$ $\ln x = \log_e x$

10er $\qquad$ $\log x = \log_{10} x$

dualis $\qquad$ $\mathrm{ld}\, x = \log_2 x$

S 48)

1) $\log \frac{1}{100} - \sqrt{e}^{\,\ln 4} + 4^{\operatorname{ld} 3} - 2 \operatorname{ld} 0{,}25$

$\log 10^{-2} - (e^{1/2})^{\ln 4} + (2^2)^{\operatorname{ld} 3} - \operatorname{ld} \left(\frac{1}{4}\right)^2$ $\qquad \frac{1}{4} = \left(\frac{1}{2}\right)^2 = (2^{-1})^2$

$\log 10^{-2} - e^{\ln (4)^{1/2}} + 2^{\operatorname{ld} 3^2} - \operatorname{ld} (2^{-2})^2$ $\qquad \downarrow\ 2^{-2}$

$-2 \quad -2 \quad +9 \quad +4 \quad = 9$

2) $100^{\log 3} - \ln \frac{1}{e^2} + 0{,}5 \operatorname{ld} 16 - e^{-3 \ln \frac{1}{2}}$

$10^{2 \cdot \log 3} - \ln e^{-2} + \operatorname{ld} (2^4)^{1/2} - e^{\ln \left(\frac{1}{2}\right)^{-3}}$

$10^{\log 3^2} - \ln e^{-2} + \operatorname{ld} 2^2 - e^{\ln 2^3}$

$9 \quad +2 \quad +2 \quad -8 \quad = 5$

3) $\left(\frac{1}{8}\right)^{ld2} - 6\ln \sqrt[1/3]{e} + \frac{1}{4}\, ld\, 64 - \frac{1}{2}\log \frac{1}{1000} + \sqrt[3]{e}^{\,\ln 27}$

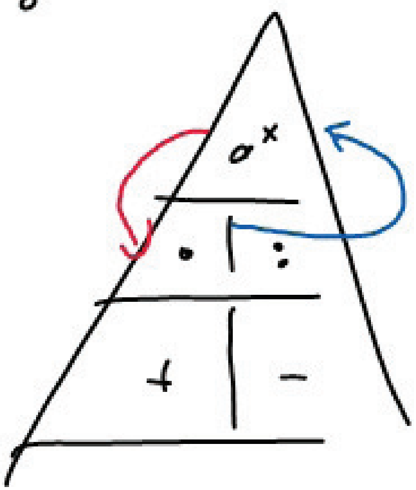
$2^{-3\,ld2} - \ln\left(e^{-1/3}\right)^6 + ld\left(2^6\right)^{1/4} - \log\left(10^{-3}\right)^{1/2} + e^{\ln 27^{1/3}}$

$1/8 \quad + \quad 2 \quad + \quad 3/2 \quad + \quad 3/2 \quad + \quad 3$

EXP

$8^{1/8}$

$\left(e^{-1/3}\right)^6$



$1/2 \log 1/1000$

$\log\left(1/1000\right)^{1/2}$

LOG

4) $\left(\frac{1}{\sqrt{e}}\right)^{\ln \frac{1}{9}} + 100^{\log \frac{1}{2^{-2}}} - 16^{\frac{1}{2} \operatorname{ld} 4} + 2 \log 0{,}001$

$- 3 \ln \frac{1}{e^3} + \frac{1}{4} \operatorname{ld} \frac{1}{256}$

$e^{-\frac{1}{2} \ln \frac{1}{9}} + 10^{2 \log 2^2} - 2^{4 \cdot \frac{1}{2} \operatorname{ld} 4} + \log (10^{-3})^2$

$- \ln (e^{-3})^3 + \operatorname{ld} (2^{-8})^{\frac{1}{4}}$

$\cancel{1}3 + 16 - 16 - 6 + 9 - 2 = 4$