

S 70 Nr. 1

a) $\ln(e) = \ln(e^1) = 1$; b) $\ln(e^3) = 3$; c) $\ln(1) = \ln(e^0) = 0$

d) $\ln(\sqrt{e}) = \ln(e^{\frac{1}{2}}) = \frac{1}{2}$; e) $\ln(\frac{1}{e^2}) = \ln(e^{-2}) = -2$

f) $e^{\ln(4)} = 4$; g) $3 \cdot \ln(e^2) = 3 \cdot 2 = 6$; h) $e^{2 \cdot \ln(3)} = e^{\ln(3)^2} = e^{\ln(9)} = 9$

i) $e^{\frac{1}{2} \ln(9)} = e^{\ln(9)^{\frac{1}{2}}} = e^{\ln(\sqrt{9})} = e^{\ln(3)} = 3$

j) $\ln(e^{3,5} \cdot \sqrt{e}) = \ln(e^{3,5} \cdot e^{\frac{1}{2}}) = \ln(e^{3,5 + \frac{1}{2}}) = \ln(e^4) = 4$

S 70 Nr. 2

a) $e^x = 15 \Rightarrow \ln(e^x) = \ln(15) \Rightarrow x = \ln(15) \approx 2,708$

b) $e^z = 2,4 \Rightarrow \ln(e^z) = \ln(2,4) \Rightarrow z = \ln(2,4) \approx 0,875$

c) $e^{2x} = 7 \Rightarrow \ln(e^{2x}) = \ln(7) \Rightarrow 2x = \ln(7) \Rightarrow x = \frac{\ln(7)}{2} \approx 0,973$

d) $3 \cdot e^{4x} = 16,2 \Rightarrow e^{4x} = \frac{16,2}{3} \Rightarrow \ln(e^{4x}) = \ln(\frac{16,2}{3})$

$\Rightarrow 4x = \ln(\frac{16,2}{3}) \Rightarrow x = \frac{1}{4} \cdot \ln(\frac{16,2}{3}) \approx 0,422$

e) $e^{2x-1} = 1 \Rightarrow \ln(e^{2x-1}) = \ln(1) \Rightarrow 2x-1=0 \Rightarrow x = \frac{1}{2}$

f) $4 \cdot e^{-2x-3} = 6 \Rightarrow e^{-2x-3} = \frac{6}{4} = \frac{3}{2} \Rightarrow \ln(e^{-2x-3}) = \ln(\frac{3}{2})$

$\Rightarrow -2x-3 = \ln(\frac{3}{2}) \Rightarrow -2x = 3 + \ln(\frac{3}{2}) \Rightarrow x = -\frac{1}{2}(3 + \ln(\frac{3}{2})) \approx -1,702$

g) $2e^{3x+4} = \frac{2}{e} \Rightarrow e^{3x+4} = \frac{1}{e} = e^{-1} \Rightarrow \ln(e^{3x+4}) = \ln(e^{-1}) = -1$

$\Rightarrow 3x+4 = -1 \Rightarrow x = -\frac{5}{3}$

h) $e^{0,5x+2} = 4 \Rightarrow \ln(e^{0,5x+2}) = \ln(4) \Rightarrow 0,5x+2 = \ln(4)$

$\Rightarrow \frac{1}{2}x = \ln(4) - 2 \Rightarrow x = 2 \cdot (\ln(4) - 2) \approx -1,227$