

LOGARITMI

E1 $2^x = 8$

E2 $2^x = 7$

Ratkaisut

E1

$2^x = 8$

$2^x = 2^3$

$x = 3$

Verrattiin kertoimia

E2 I $2^x = 7 \quad | \lg$
 $\lg 2^x = \lg 7$

$\lg = \log_{10}$

$\log_{\square} \square$

$x \cdot \lg 2 = \lg 7 \quad | : \lg 2$

lets. 98
lausel
c - kohta

$x = \frac{\lg 7}{\lg 2} \approx 2,8073\dots$

$x \approx 2,8$

\log_2

\log_3

$\ln = \log_e$

II \log^a

Määritelmä s. 97

$a > 0, a \neq 1 \text{ ja } b > 0$

a ^x = b

$x = \log_{\underline{a}} b$

2 ^x = 7

$x = \log_2 7$

$\approx 2,8073\dots$

$x \approx 2,8$

1. tapa E2

$$\frac{\log_{10}(7)}{\log_{10}(2)}$$

2. tapa E2

$$\log_2(7) \approx 2.80735492206$$

Huomataan, miten kannan vaihto tehdään.

$$\underline{E3} \quad \lg 1000 = \log_{10} 10^{\textcircled{3}} = \underline{\underline{3}}$$

$$\underline{E4} \quad \log_2 1 = \log_2 2^0 = \underline{\underline{0}}$$

$$\underline{E5} \quad \log_3 81^{\frac{1}{2}} = \log_3 \sqrt{81} = \log_3 9 = \log_3 3^2 = \underline{\underline{2}}$$

$$\begin{aligned} \underline{E6} \quad & \log_3 \sqrt[3]{9} \\ &= \log_3 (9^{\frac{1}{3}})^{\frac{1}{2}} = \log_3 9^{\frac{1}{3} \cdot \frac{1}{2}} \\ &= \log_3 9^{\frac{1}{6}} \\ &= \log_3 (3^2)^{\frac{1}{6}} = \log_3 3^{2 \cdot \frac{1}{6}} \\ &= \log_3 3^{\frac{1}{3}} = \underline{\underline{\frac{1}{3}}} \end{aligned}$$

$\log_a (xy) = \log_a x + \log_a y$ $\log_a \frac{x}{y} = \log_a x - \log_a y$
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