

$$\text{TAI: } \log_6 X = 1 - \log_6 (X-5) \quad | 6^{(\cdot)}$$

$$\Leftrightarrow 6^{\log_6 X} = 6^{1 - \log_6 (X-5)}$$

$$\left[ 2^{5-3} = \frac{2^5}{2^3} \right]$$

$$\Leftrightarrow X = \frac{6^1}{6^{\log_6 (X-5)}} \quad \Leftrightarrow X = \frac{6}{X-5} \quad | \cdot (X-5)$$

$$\Leftrightarrow X(X-5) = 6 \quad \dots$$

$$b) \quad 2 \lg (x-1) + \lg 4 = 0$$

$$x-1 > 0 \quad \Leftrightarrow \underline{x > 1}$$

$$\Leftrightarrow \lg (x-1)^2 + \lg 4 = 0$$

$$\Leftrightarrow \lg ((x-1)^2 \cdot 4) = 0$$

$$\Leftrightarrow \underbrace{10^0}_{=1} = (x-1)^2 \cdot 4 \quad | :4 \quad \Leftrightarrow (x-1)^2 = \frac{1}{4} \quad | \sqrt{\phantom{x}}$$

$$\Leftrightarrow x-1 = \pm \sqrt{\frac{1}{4}} = \pm \frac{1}{2} \quad \Leftrightarrow x = \frac{3}{2} \text{ tai } x = \frac{1}{2}$$

$$\underline{\text{Vast. } x = \frac{3}{2}}$$

$$\text{TAI: } 2 \lg (x-1) + \lg 4 = 0$$

$$\Leftrightarrow \lg (x-1) = -\frac{\lg 4}{2}$$

$$\Leftrightarrow 10^{-\frac{\lg 4}{2}} = x-1 \quad \Leftrightarrow x = 1 + 10^{-\frac{\lg 4}{2}} = 1 + 10^{\lg 4^{-\frac{1}{2}}} = 1 + 4^{-\frac{1}{2}} = 1 + \frac{1}{4^{\frac{1}{2}}} = 1 + \frac{1}{\sqrt{4}} = 1 + \frac{1}{2} = \frac{3}{2}$$

13.8 Marsin tärin virheen.

$$\log_3 x^2 = 4, \quad \underline{x \neq 0}$$

$$\Leftrightarrow 2 \log_3 x = 4$$

$$, x > 0$$

meärittelijalta muuttuu!

$$\text{KORJAUS: } \log_3 x^2 = 4$$

$$\Leftrightarrow 3^4 = x^2 \quad | \sqrt{\phantom{x}} \quad \Leftrightarrow \underline{x = \pm \sqrt{3^4} = \pm 9}$$

$$13.15 \quad f(x) = x (\log_5 x)^2 - x \log_5 x^3 = 0, \quad \underline{x > 0}$$

$$\Leftrightarrow x [(\log_5 x)^2 - \log_5 x^3] = 0$$

$$\Leftrightarrow x = 0 \text{ tai } (\log_5 x)^2 - \log_5 x^3 = 0$$

$$\Leftrightarrow (\log_5 x)^2 - 3 \log_5 x = 0$$