

Der Logarithmus - Umkehrung d. Potenziers

Aufgabe 3

a)

$$10 \cdot \log_{10}(x) = 5$$

$$\log_{10}(x) = \frac{1}{2}$$

$$10^{\frac{1}{2}} = x$$

$$\sqrt{10} = x$$

Alternative:

b)

$$\log_{10}(4x) = 2$$

$$\log_{10}(4) + \log_{10}(x) = 2$$

$$\log_{10}(x) = 2 - \log_{10}(4)$$

$$10^{2 - \log_{10}(4)} = x$$

$$25 = x$$

$$10^2 = 4x$$

$$100 = 4x$$

$$25 = x$$

c)

$$\log_{10}(x-2) + \log_{10}(x-11) = 1$$

$$\log_{10}((x-2)(x-11)) = 1$$

$$(x-2)(x-11) = 10^1$$

$$x^2 - 11x - 2x + 22 = 10$$

$$x^2 - 13x + 12 = 0$$

$$x_{0/1} = \frac{13 \pm \sqrt{\left(\frac{13}{2}\right)^2 - 12}}{2}$$

$$x_0 = 12 \quad x_1 = 1$$

Probe: $\log_{10}(12-2) + \log_{10}(12-11) = 1$

$$1 + 1 = 2 \neq 1 \quad \checkmark$$

$$\log_{10}(1-2) + \log_{10}(1-11) = 1 \quad \times$$