3a)

Exponentialfunktion

$$f(x) = c \cdot a^x$$

$$\log(f(x)) = \log(c \cdot a^x)$$

$$\log(f(x)) = \underbrace{\log(c)}_{b} + \underbrace{x}_{x} \cdot \underbrace{\log(a)}_{m}$$

Potenzfunktion

$$f(x) = c \cdot x^a$$

$$\log(f(x)) = \log(c \cdot x^a)$$

$$\log(f(x)) = \underbrace{\log(c)}_{b} + \underbrace{a}_{m} \cdot \underbrace{\log(x)}_{x}$$

$$f(x) = \frac{5}{\sqrt[3]{2x^2}}$$

$$= \frac{5}{(2x^2)^{\frac{1}{3}}}$$

$$= \frac{5}{2x^{\frac{2}{3}}}$$

$$f(x) = 5 \cdot 2x^{-\frac{2}{3}}$$

$$\log(f(x)) = \log\left(5 \cdot 2x^{-\frac{2}{3}}\right)$$

$$= \log(5) + -\frac{2}{3} \cdot \log(2 \cdot x)$$

b m x

$$g(x) = 10^5 \cdot (2e)^{-x/100}$$

$$\log(g(x)) = \log(10^5) + \log\left((2e)^{-x/100}\right)$$

$$= \underbrace{5}_{b} + \underbrace{-\frac{x}{100}}_{x} \cdot \underbrace{\log(2e)}_{m}$$