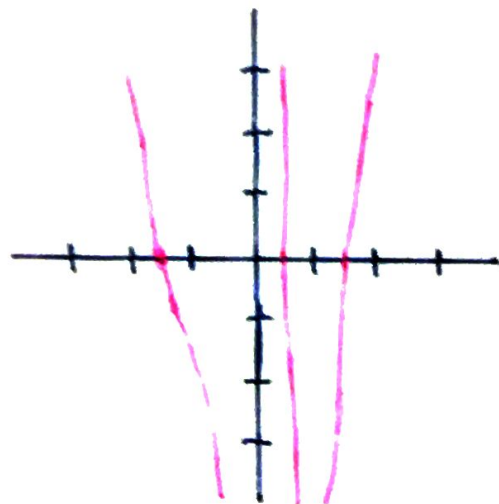


$$1.) \quad e^{x^2} + x^{-3} = 10 \Rightarrow f(x) = e^{x^2} + x^{-3} - 10$$

Skizze:



Newton

$$x_0 = 2, \quad x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}, \quad f(x) = e^{x^2} + \frac{1}{x^3} - 10, \quad f'(x) = 2xe^{x^2} - \frac{3}{x^4}$$

$$x_0 = 2$$

$$x_1 = 2 - \frac{e^2 + \frac{1}{2^3} - 10}{2 \cdot 2 \cdot e^2 - \frac{3}{2^4}} = 1.7950$$

$$x_2 = x_1 - \frac{e^{x_1^2} + \frac{1}{x_1^3} - 10}{2 \cdot x_1 \cdot e^{x_1^2} - \frac{3}{x_1^4}} = 1.6251$$

$$x_3 = 1.5308$$

$$x_4 = 1.5086$$

vereinfachtes Newton

$$x_0 = 0.5, \quad f'(x_0) = -46.7160$$

$$x_1 = x_0 - \frac{e^{x_0^2} + \frac{1}{x_0^3} - 10}{-46.7160} = 0.4847$$

$$x_2 = 0.4857$$

$$x_3 = 0.4856$$

$$x_4 = 0.4856$$

Selante

$$x_0 = -1 \quad f(x_0) = e - 11$$

$$x_1 = -1.2 \quad f(x_1) = -6.3580$$

$$x_2 = x_1 - \frac{x_1 - x_0}{f(x_1) - f(x_0)} \cdot f(x_1) = -1.8610$$

$$f(x_2) = 21.7695$$

$$x_3 = -1.3494$$

$$f(x_3) = -4.5635$$

$$x_4 = -1.4381$$