1. $[-2,-1]$, $[0,1]$, $[1,2]$

a) Newton-Verfahren

$f(x) = e^{x^2} + x^{-3} - 10$

$f'(x) = e^{x^2} \cdot 2x - 3x^{-4}$

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

$x_2 = \ldots$ $= 1.6251$

$x_3 = \ldots$ $= 1.5308$

$x_4 = \ldots$ $= 1.5086$

b) vereinfachtes Newton-Verfahren

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

$$x_1 = x_0 - \frac{f(0.5)}{f'(0.5)} = 0.4847$$

$x_2 =$ 0.4857

$x_3 =$ 0.4856

$x_4 =$ 0.4856

c) Sekanten-Verfahren

$$x_{n+1} = x_n - \frac{x_n - x_{n-1}}{f(x_n) - f(x_{n-1})} \cdot f(x_n)$$

$x_{n-1} = -1.0$

$x_n = -1.2$

$= -1.8610$

$= -1.3494$

$= -1.4326$

$= -1.5394$