

Aufgabe 3

$$a) \quad 2e^{3x^2-2} - 10 = 0$$

$$2e^{3x^2-2} = 10$$

$$e^{3x^2-2} = 5$$

$$3x^2 - 2 = \ln 5$$

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

$$x_{1/2} = \pm \frac{2 + \ln 5}{3}$$

$$L = \left\{ -\frac{2 + \ln 5}{3}, \frac{2 + \ln 5}{3} \right\}$$

$$b) \quad e^{2x} - (e-1) \cdot e^x - e = 0 \quad u := e^x$$

$$u^2 - (e-1)u - e = 0$$

$$u_{1/2} = \frac{e-1 \pm \sqrt{(e-1)^2 + 4e}}{2}$$

$$u_{1/2} = \frac{e-1 \pm \sqrt{e^2 - 2e + 1 + 4e}}{2}$$

$$= \frac{e-1 \pm \sqrt{e^2 + 2e + 1}}{2}$$

$$= \frac{e-1 \pm \sqrt{(e+1)^2}}{2} = \frac{e-1 \pm (e+1)}{2}$$

$$u_{1/2} = \frac{e-1 + e+1}{2}; \quad u_1 = \frac{e-1+e+1}{2} = \frac{2e}{2} = e \Rightarrow e^x = 1$$

$$u_2 = \frac{e-1 - e-1}{2} = -1 \quad x = 1$$

$$L = \{1\}$$

Aufgabe 4

$$a) \quad x_1 = -2 \quad \text{Pol ohne VZW}$$

$$x_2 = 1 \quad \text{" mit VZW}$$

$$\text{waap. N. } y = 0$$

$$\text{Nullstelle } y = -1$$

$$f(x) = \frac{x+1}{(x+2)^2(x-1)}$$

$$b) \quad \text{waap. N. } y = 1 \quad \text{Nullstelle } x = 1$$

$$\text{Pol mit VZW } x = 2$$

$$f(x) = \frac{x-1}{x-2}$$