

$$\text{Nr. 7) a) } e^x \cdot 2 - e^x \cdot e^x = 0 \Rightarrow \underbrace{e^x}_{\neq 0} \cdot (2 - e^x) = 0$$

$$\Rightarrow 2 - e^x = 0 \Rightarrow e^x = 2 \mid \ln \Rightarrow \underline{\underline{x = \ln(2) \approx 0,693}}$$

$$\text{b) } 4e^{-x} - e^{-x} \cdot x^2 = 0 \Rightarrow \underbrace{e^{-x}}_{\neq 0} \cdot (4 - x^2) = 0$$

$$\Rightarrow 4 - x^2 = 0 \Rightarrow x^2 = 4 \Rightarrow \underline{\underline{x_{1,2} = \pm \sqrt{4} = \pm 2}}$$

$$\text{c) } e^{2x} - 7e^x = 0 \Rightarrow e^x \cdot (e^x - 7) = 0 \Rightarrow$$

$$e^x = 7 \mid \ln \Rightarrow \underline{\underline{x = \ln(7) \approx 1,946}}$$

$$\text{d) } e^{3x} - 9e^x = 0 \Leftrightarrow (e^x)^3 - 9e^x = 0$$

$$\Rightarrow \underbrace{e^x}_{\neq 0} \cdot ((e^x)^2 - 9) = 0 \Rightarrow (e^x)^2 = 9 \mid \sqrt{\quad} \Rightarrow e^x = \pm 3$$

$$e^x = 3 \mid \ln \Rightarrow \underline{\underline{x = \ln(3)}} \vee \underline{\underline{e^x = -3}} \text{ keine Lösung}$$

$$\text{e) } x^2 \cdot e^{3x} - 5x^2 = 0 \Leftrightarrow x^2 \cdot (e^{3x} - 5) = 0 \Rightarrow \underline{\underline{x_1 = 0}}$$

$$e^{3x} - 5 = 0 \Rightarrow e^{3x} = 5 \mid \ln \Rightarrow 3x = \ln(5) \Rightarrow \underline{\underline{x_2 = \frac{1}{3} \ln(5)}}$$

$$\text{f) } e^{2x} - e^{x+1} = 0 \Leftrightarrow e^{2x} - e^x \cdot e^1 = 0 \Leftrightarrow e^x(e^x - e) = 0$$

$$\Rightarrow e^x - e = 0 \mid +e \Rightarrow e^x = e \mid \ln \Rightarrow \underline{\underline{x = \ln(e) = 1}}$$