

$$1) e^{x-1} - 3 = 0 \quad | +3 \quad | \ln()$$

$$\Leftrightarrow x-1 = \ln(3)$$

$$\Leftrightarrow x = \ln(3) + 1$$

$$\Leftrightarrow x \approx 2,10$$

$$2) \ln(x+1) = 2 \quad | e^{(\dots)}$$

$$\Leftrightarrow x+1 = e^2$$

$$\Leftrightarrow x = e^2 - 1$$

$$\Leftrightarrow x \approx 6,39$$

$$3) e^{2x} = 1 + e^x$$

$$z = e^x$$

$$e^{2x} = (e^x)^2$$

$$\Rightarrow z^2 = 1 + z \quad | -1 \quad | -z$$

$$\Leftrightarrow z^2 - z - 1 = 0$$

$$\Leftrightarrow z_{1,2} = \frac{1}{2} \pm \sqrt{\frac{1}{4} + 1} = \frac{1}{2} \pm \sqrt{\frac{5}{4}}$$

$$z_1 \approx 1,62 \Rightarrow x_1 \approx 0,481$$

$$z_2 \approx -0,618 \quad \text{Knif}$$

Hausaufgabe: S. 116 Nr. 2 a

$$f(x) = a \cdot (x - x_{01}) \cdot (x - x_{02}) \cdot (x - x_{03})$$

$$= a \cdot (x + 2) \cdot (x - 0) \cdot (x - 1)$$

$$= a x (x + 2) \cdot (x - 1)$$

$$= a x (x^2 + x - 2) = a (x^3 + x^2 - 2x)$$

$$f(-1) = 2$$

$$\Rightarrow 2 = a((-1)^3 + (-1)^2 - 2(-1))$$

$$\Leftrightarrow 2 = a(-1 + 1 + 2)$$

$$\Leftrightarrow 2 = a \cdot 2 \quad | : 2$$

$$\Leftrightarrow a = 1 \quad \checkmark$$

$$\underline{f(x) = x^3 + x^2 - 2x}$$

Mr. 2 b)

$$f(x) = ax^3 + bx^2 + cx + d$$

$$f'(x) = 3ax^2 + 2bx + c$$

$$f(0) = 0$$

$$f(1) = -1$$

$$f(2) = 0$$

$$f'(2) = 0 \quad (H)$$

H.A. S. 116 Nr. 2 b, c