

2. SA. - Vorlesung - Musterlös

$$1) \begin{array}{l} \text{I} \quad x + y + z = 2 \\ \text{II} \quad -3x + 3y - z = -2 \\ \text{III} \quad 2x - 4y + 4z = 4 \end{array} \Rightarrow z = 1 \checkmark$$

$$\begin{array}{l} \text{I} + \text{II} = \text{II}' \quad -2x + 4y = 0 \checkmark \Rightarrow x = \frac{2}{3} \checkmark \\ \text{III} - 4\text{I} = \text{III}' \quad -2x - 8y = -4 \checkmark \end{array}$$

(5 BE)

$$\text{III}' - \text{II}' = \text{III}'' \quad -12y = -4 \checkmark \Rightarrow y = +\frac{1}{3} \checkmark$$

$$2) \quad 2x^2 - 2 = x^2 - 2x - 2$$

$$x^2 + 2x = 0$$

$$x(x+2) = 0$$

$$x_1 = 0, x_2 = -2 \Rightarrow L = \{-2; 0\}$$

$$3.1) \quad S(2|3), y = 1 \Rightarrow T(0|1)$$

$$1 = a(0-2)^2 + 3 \checkmark$$

$$4a = -2$$

$$a = -\frac{1}{2} \checkmark \Rightarrow f(x) = -\frac{1}{2}(x-2)^2 + 3 \checkmark$$

(4 BE)

$$3.2) \quad a = 1 \checkmark, U(0|0) \Rightarrow c = 0 \checkmark, P(3|3)$$

$$f(x) = x^2 + bx$$

$$3 = 9 + 3b \checkmark$$

$$b = -2 \checkmark$$

$$\Rightarrow f(x) = x^2 - 2x \checkmark$$

(5 BE)

$$4) \quad f(x) = \frac{1}{4}x^2 - 1, h(x) = -\frac{1}{2}(x-2)^2$$

$$4.1) \quad \frac{1}{4}x^2 = 1 \checkmark$$

$$x^2 = 4 \quad | \pm \sqrt{}$$

$$x_1 = 2, x_2 = -2 \checkmark$$

(3 BE)

$$4.2) \quad f: S_f(0|-1) \checkmark, h: S_h(2|0) \checkmark$$

(2 BE)

$$4.3) \quad \frac{1}{4}x^2 - 1 = -\frac{1}{2}x^2 + 2x - 2 \checkmark$$

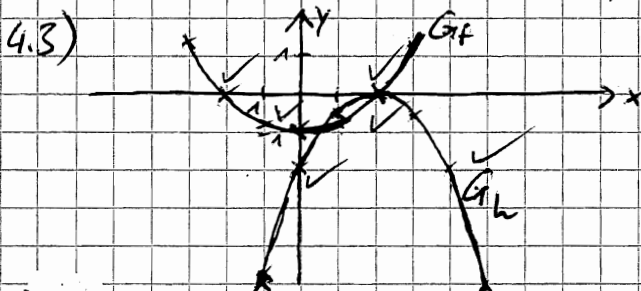
$$\frac{3}{4}x^2 - 2x + 1 = 0 \checkmark$$

$$x_{1,2} = \frac{2 \pm 1}{\frac{3}{2}}, \quad x_1 = 2 \checkmark, \quad x_2 = \frac{2}{3} \checkmark$$

(7 BE)

$$\Delta = 4 - 3 \cdot 1 = 1 \checkmark$$

$$f(2) = 0 \checkmark \Rightarrow SP_1(2|0) \checkmark, f\left(\frac{2}{3}\right) = -\frac{8}{9} \checkmark \Rightarrow SP_2\left(\frac{2}{3} \mid -\frac{8}{9}\right) \checkmark$$



(6 BE)



$$5.0) \quad h(x) = -\frac{1}{10}(x^2 - 6x - 16)$$

$$5.1) \quad x^2 - 6x - 16 = 0 \quad \checkmark$$

$$D = 36 + 4 \cdot 1 \cdot 16 = 100 \quad \checkmark$$

$$x_{1/2} = \frac{6 \pm 10}{2} \quad \checkmark; \quad x_1 = 8 \quad \checkmark, \quad (x_2 = -2) \quad (48E)$$

Die Entfernung vom Stein, wenn er am Boden landet, beträgt 8m. $\checkmark$

$$5.2) \quad x_s = \frac{-\frac{3}{5}}{2 \cdot (-\frac{1}{10})} = 3 \quad \checkmark, \quad h(3) = 2,5 \quad \checkmark$$

Der Stein erreicht eine maximale Höhe von 2,5m. $\checkmark$ (38E)

$$5.3) \quad -\frac{1}{10}x^2 + \frac{3}{5}x + \frac{8}{5} = \frac{1}{2} \quad \checkmark$$

$$-\frac{1}{10}x^2 + \frac{3}{5}x + \frac{11}{10} = 0$$

$$-\frac{1}{10}(x^2 - 6x - 11) = 0 \quad \checkmark$$

$$D = 36 + 44 = 80 \quad \checkmark$$

$$x_{1/2} = \frac{6 \pm 8,95}{2}$$

$$x_1 = 7,475 \quad \checkmark, \quad (x_2 = -1,475)$$

Der Baum ist 7,475m von Maxi entfernt. (48E)