

S 221 Nr. 14

f hat Grad 4 und ist symmetrisch zur y-Achse

$$\Rightarrow f(x) = ax^4 + bx^2 + c \quad W_1(1|0), W_2(-1|0)$$

$$f'(x) = 4ax^3 + 2bx$$

Wendetangente b

$$f''(x) = 12ax^2 + 2b$$

$$W(1|0): f(1) = a \cdot 1^4 + b \cdot 1^2 + c = 0$$

notw. Bed.  
Wendep.

$$f''(1) = 12a \cdot 1^2 + 2b = 0$$

Wendetangente  
Schneiden  $\perp$

$$f'(1) = -\frac{1}{f'(-1)} \Rightarrow 4a \cdot 1^3 + 2b \cdot 1^3 = \frac{-1}{4a(-1)^3 + 2b(-1)}$$

$$4a + 2b = \frac{-1}{-4a - 2b} = \frac{1}{4a + 2b} \quad | \cdot HN = 4a + 2b$$

$$(4a + 2b)^2 = 1 \quad | \sqrt{\quad}$$

$$|4a + 2b| = 1$$

$$4a + 2b = \pm 1$$

Mit den beiden oben erstellten Gleichungen folgen 2 LGS

$$\begin{array}{l} \text{LGS I} \\ a + b + c = 0 \\ 12a + 2b = 0 \\ 4a + 2b = +1 \end{array}$$

$$\left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ 12 & 2 & 0 & 0 \\ 4 & 2 & 0 & 1 \end{array} \right)$$

$$\begin{array}{l} \text{GTR} \\ \Rightarrow \left( \begin{array}{ccc|c} 1 & 0 & 0 & -\frac{1}{8} \\ 0 & 1 & 0 & \frac{3}{4} \\ 0 & 0 & 1 & -\frac{5}{8} \end{array} \right) \end{array}$$

$$\underline{\underline{f_{\text{I}}(x) = -\frac{1}{8}x^4 + \frac{3}{4}x^2 - \frac{5}{8}}}$$

$$\begin{array}{l} \text{LGS II} \\ a + b + c = 0 \\ 12a + 2b = 0 \\ 4a + 2b = -1 \end{array}$$

$$\left( \begin{array}{ccc|c} 1 & 1 & 1 & 0 \\ 12 & 2 & 0 & 0 \\ 4 & 2 & 0 & -1 \end{array} \right)$$

$$\begin{array}{l} \text{GTR} \\ \Rightarrow \left( \begin{array}{ccc|c} 1 & 0 & 0 & \frac{1}{8} \\ 0 & 1 & 0 & -\frac{3}{4} \\ 0 & 0 & 1 & \frac{5}{8} \end{array} \right) \end{array}$$

$$\underline{\underline{f_{\text{II}}(x) = \frac{1}{8}x^4 - \frac{3}{4}x^2 + \frac{5}{8}}}$$