Nr. 1

i	0	1	2	3
x_i	-2	0	1	2
y_i	4	0	1	-4

Es gibt 4 Punkte: $m = 4$

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

$$A = \begin{pmatrix} 1 & -2 \\ 1 & 0 \\ 1 & 1 \\ 1 & 2 \end{pmatrix} \qquad b = \begin{pmatrix} 4 \\ 0 \\ 1 \\ -4 \end{pmatrix} \qquad x = \begin{pmatrix} a \\ b \end{pmatrix}$$

$$A^TA = \begin{pmatrix} 4 & 1 \\ 1 & 9 \end{pmatrix} \qquad A^Tb = \begin{pmatrix} 1 \\ -15 \end{pmatrix}$$

$$\Rightarrow \begin{matrix} 4a + 1b = 1 \\ 1a + 9b = -15 \end{matrix} \quad \Rightarrow \left(\begin{array}{cc|c} 4 & 1 & 1 \\ 1 & 9 & -15 \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{cc|c} 0 & -35 & 61 \\ 1 & 9 & -15 \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{cc|c} 0 & 1 & -\frac{61}{35} \\ 1 & 9 & -15 \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{cc|c} 0 & 1 & -\frac{61}{35} \\ 1 & 0 & -15 + 9 \cdot \frac{61}{35} \end{array}\right)$$

$$\Leftrightarrow \left(\begin{array}{cc|c} 0 & 1 & -\frac{61}{35} \\ 1 & 0 & \frac{24}{35} \end{array}\right)$$

$$\Rightarrow \quad f(x) = \frac{24}{35} - \frac{61}{35}x^2$$