

Quadratische Funktion aus 3 gegebenen Punkten berechnen

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

$$\begin{array}{l} A(4|4) \rightarrow \\ B(-8|-8) \rightarrow \\ C(2|-3) \rightarrow \end{array} \rightarrow \left| \begin{array}{l} 4 = a \cdot 16 + b \cdot 4 + c \\ -8 = a \cdot 64 + b \cdot (-8) + c \\ -3 = a \cdot 4 + b \cdot 2 + c \end{array} \right| \xrightarrow{\text{LGS}} \left| \begin{array}{l} 4 = 16a + 4b + c \\ -8 = 64a - 8b + c \\ -3 = 4a + 2b + c \end{array} \right| \cdot (-1)$$

$$\left| \begin{array}{l} 4 = 16a + 4b + c \\ 8 = -64a + 8b - c \\ -3 = 4a + 2b + c \end{array} \right| \xrightarrow{\begin{array}{l} (+) \\ (+) \end{array}} \left| \begin{array}{l} 12 = -48a + 12b \\ 5 = -60a + 10b \end{array} \right| \cdot \begin{array}{l} 10 \\ (-12) \end{array}$$

$$\left| \begin{array}{l} 120 = -480a + 120b \\ -60 = 720a - 120b \end{array} \right| \xrightarrow{(+)} 60 = 240a \quad | : 240$$

$$\underline{\underline{\frac{1}{4} = a}}$$

$$\begin{array}{l} 5 = -60 \cdot \frac{1}{4} + 10b \\ 5 = -15 + 10b \quad | +15 \\ 20 = 10b \quad | : 10 \\ \underline{\underline{2 = b}} \end{array}$$

$$\begin{array}{l} -3 = 4 \cdot \frac{1}{4} + 2 \cdot 2 + c \\ -3 = 1 + 4 + c \\ -3 = 5 + c \quad | -5 \\ \underline{\underline{-8 = c}} \end{array}$$

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

$$\boxed{f(x) = \frac{1}{4}x^2 + 2x - 8}$$