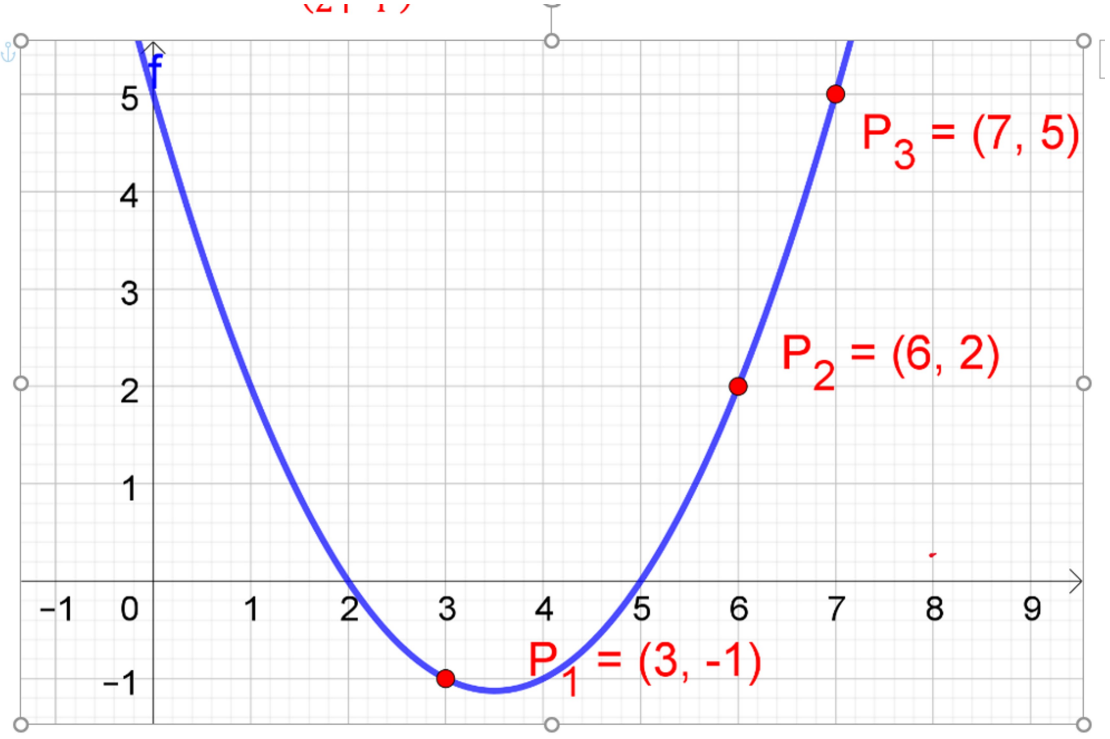

$f(x) = a_2x^2 + a_1x + a_0$

$$\begin{array}{l|l|l} f(3) = -1 & 9a_2 + 3a_1 + 1a_0 = -1 & \text{I} \\ f(6) = 2 & 36a_2 + 6a_1 + 1a_0 = 2 & \text{II} \\ f(7) = 5 & 49a_2 + 7a_1 + 1a_0 = 5 & \text{III} \end{array}$$

$$\begin{array}{l|l} \text{II}' = \text{II} - \text{I} & 27a_2 + 3a_1 = 3 \\ \text{III}' = \text{III} - \text{II} & 13a_2 + 1a_1 = 3 \end{array}$$

$$\begin{array}{r} 39 \\ -27 \\ \hline 12 \end{array}$$

$\text{III}'' = 3 \cdot \text{III}' - \text{II}'$ $\quad 12a_2 = 6 \mid :14$

$$\boxed{a_2 = \frac{1}{2}}$$

Einsetzen in III'

$13 \cdot \frac{1}{2} + a_1 = 3 \mid -\frac{13}{2}$

$a_1 = \frac{6}{2} - \frac{13}{2} = -\frac{7}{2}$

$$\boxed{a_1 = -\frac{7}{2}}$$

Einsetzen in I

$a_1 = 5$

Einsetzen in I

$$9 \cdot \frac{1}{2} - 3 \cdot \frac{7}{2} + a_1 = -1$$

$$\frac{9-21}{2} + a_1 = -1$$

$$-\frac{12}{2} + a_1 = -1 \quad | +6$$

$$\boxed{a_1 = 5}$$

Damit lautet die Funktionsgleichung:

$$\boxed{f(x) = \frac{1}{2}x^2 - \frac{7}{2}x + 5}$$

b) Nullstellen

$$f(x) = 0$$

$$\frac{1}{2}x^2 - \frac{7}{2}x + 5 = 0 \quad | \cdot 2$$

$$x^2 - 7x + 10 = 0 \quad | -10$$

$$x^2 - 7x = -10 \quad | +\left(\frac{7}{2}\right)^2$$

$$\left(x - \frac{7}{2}\right)^2 = -\frac{40}{4} + \frac{49}{4}$$

$$\left(x - \frac{7}{2}\right)^2 = \frac{9}{4} \quad | \pm\sqrt{\ }$$

$$x - \frac{7}{2} = -\frac{3}{2} \vee x - \frac{7}{2} = \frac{3}{2} \quad | + \frac{7}{2}$$

$$x = \frac{4}{2} = \underline{\underline{2}} \vee x = \frac{10}{2} = \underline{\underline{5}}$$

c)

$$x_S = \frac{2+5}{2} = \frac{7}{2}$$

$$f(x_S) = \frac{1}{2} \cdot \left(\frac{7}{2}\right)^2 - \frac{7}{2} \cdot \frac{7}{2} + 5$$

$$= \frac{49}{8} - \frac{49}{4} + 5 = -\frac{49}{8} + \frac{40}{8} = -\frac{9}{8}$$

$$= -1{,}125$$

$= -1{,}125$

$$S\left(\frac{7}{2}\middle|-\frac{9}{8}\right) = S\left(3{,}5\middle|-1{,}125\right)$$