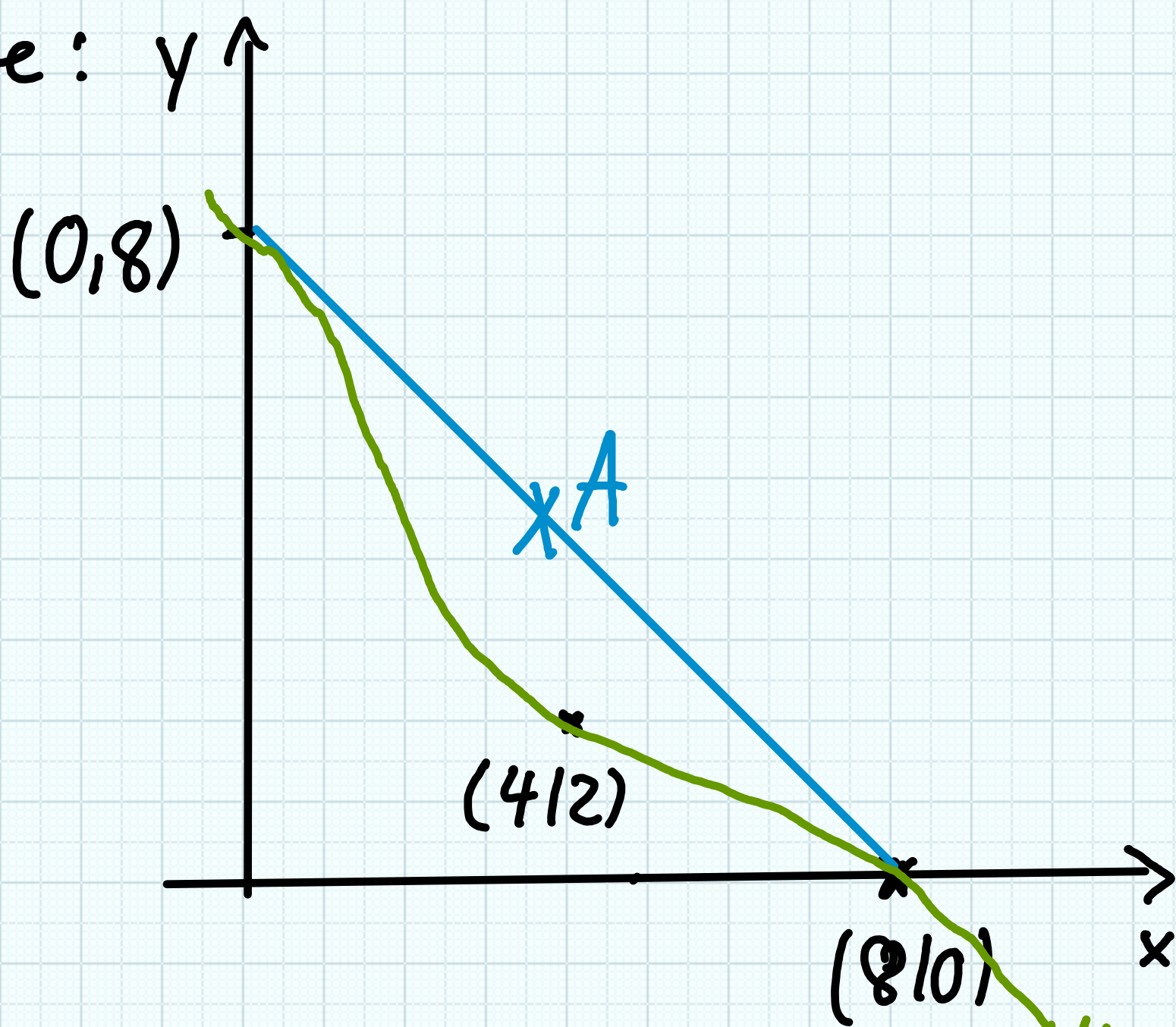


Aufgabe 4b

Skizze: y



Umgehungsstraße

Steigung Gerade: -1

$$f(x) = ax^4 + bx^3 + cx^2 + dx + e$$

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

PP(0|8) : $8 = 0 + 0 + 0 + 0 + e \Rightarrow e = 8$

PP(8|0) : $0 = 8^4a + 8^3b + 8^2c + 8d + 8$

St.P : $-1 = 0 + 0 + 0 + d \Rightarrow d = -1$

St.Q : $-1 = 4a \cdot 8^3 + 3b \cdot 8^2 + 2c \cdot 8 + d$

PP(4|2) : $2 = 4^4a + 4^3b + 4^2c + 4d + e$

$d = -1$ und $e = 8$ vereinfachen das
GS

$$4096a + 512b + 64c = 0$$

$$2048a + 192b + 16c = 0$$

$$256a + 64b + 16c = -2$$

$$\begin{array}{l} \text{I} \\ \text{II} \\ \text{III} \end{array} \left(\begin{array}{ccc|c} 4096 & 512 & 64 & 0 \\ 2048 & 192 & 16 & 0 \\ 256 & 64 & 16 & -2 \end{array} \right) \begin{array}{l} :4 \\ -\frac{1}{4}\text{I} \\ -\frac{1}{4}\text{I} \end{array} \left(\begin{array}{ccc|c} 1024 & 128 & 16 & 0 \\ 1024 & 64 & 0 & 0 \\ -768 & -64 & 0 & -2 \end{array} \right) \text{III}$$

$$\left(\begin{array}{ccc|c} 1024 & 128 & 16 & 0 \\ 1024 & 64 & 0 & 0 \\ 256 & 0 & 0 & -2 \end{array} \right)$$

$$256a = -2 \Rightarrow a = -\frac{1}{128}$$

$$-\frac{1024}{128} + 64b = 0 \Rightarrow b = \frac{1}{8}$$

$$-\frac{1024}{128} + \frac{128}{8} + 16c = 0 = c = -\frac{1}{2}$$

$$y = -\frac{1}{128}x^4 + \frac{1}{8}x^3 - \frac{1}{2}x^2 - x + 8$$