$$\sum_{i=1}^{n} y_i - na - b\sum_{i=1}^{n} x_i - c\sum_{i=1}^{n} x_i^2 = 0$$

$$\sum_{i=1}^{n} x_i y_i - a\sum_{i=1}^{n} x_i - b\sum_{i=1}^{n} x_i^2 - c\sum_{i=1}^{n} x_i^3 = 0$$

$$\sum_{i=1}^{n} x_i^2 y_i - a\sum_{i=1}^{n} x_i^2 - b\sum_{i=1}^{n} x_i^3 - c\sum_{i=1}^{n} x_i^4 = 0 \quad ,$$

que se escribe como:

$$\underbrace{\begin{pmatrix} 1 & \frac{1}{n}\sum_{i=1}^{n} x_i & \frac{1}{n}\sum_{i=1}^{n} x_i^2 \\ \frac{1}{n}\sum_{i=1}^{n} x_i & \frac{1}{n}\sum_{i=1}^{n} x_i^2 & \frac{1}{n}\sum_{i=1}^{n} x_i^3 \\ \frac{1}{n}\sum_{i=1}^{n} x_i^2 & \frac{1}{n}\sum_{i=1}^{n} x_i^3 & \frac{1}{n}\sum_{i=1}^{n} x_i^4 \end{pmatrix}}_{\equiv A} \begin{pmatrix} a \\ b \\ c \end{pmatrix} = \underbrace{\begin{pmatrix} \frac{1}{n}\sum_{i=1}^{n} y_i \\ \frac{1}{n}\sum_{i=1}^{n} x_i y_i \\ \frac{1}{n}\sum_{i=1}^{n} x_i^2 y_i \end{pmatrix}}_{\equiv \vec{f}} .$$

(0.5)

Así, una condición requerida es que A sea invertible. (0.4)

y entonces $\begin{pmatrix} a \\ b \\ c \end{pmatrix} = A^{-1}\vec{f}$ (0.1)

(c) (i) Igual que antes, definiendo

$$Q = \begin{pmatrix} 1 & x_1 & x_1^2 & \cdots & x_1^{m-1} \\ \vdots & \vdots & \vdots & & \vdots \\ 1 & x_n & x_n^2 & \cdots & x_n^{m-1} \end{pmatrix} ,$$

(0.8) $\vec{x} = \begin{pmatrix} a_0 \\ \vdots \\ a_{m-1} \end{pmatrix}$, $\vec{d} = \begin{pmatrix} y_1 \\ \vdots \\ y_n \end{pmatrix}$