

6.A

$$\frac{\partial \chi^2(a_0, a_1)}{\partial a_0} = 0 \Rightarrow -2 \sum_{i=1}^N (y_i - a_0 - a_1 x_i) = 0$$

$$\sum_{i=1}^N y_i - \sum_{i=1}^N a_0 - \sum_{i=1}^N a_1 x_i = 0$$

$$\sum_{i=1}^N y_i - N a_0 - a_1 \sum_{i=1}^N x_i = 0$$

$$a_0 = \frac{\sum_{i=1}^N y_i - a_1 \sum_{i=1}^N x_i}{N}$$

$$a_0 = \bar{y} - a_1 \bar{x}$$

$$\frac{\partial \chi^2(a_0, a_1)}{\partial a_1} = 0 \Rightarrow -2 \sum_{i=1}^N x_i y_i - x_i a_0 - a_1 x_i^2 = 0$$

$$\sum_{i=1}^N x_i y_i - x_i \bar{y} + a_1 x_i \bar{x} - a_1 x_i^2 = 0$$

$$\sum_{i=1}^N x_i y_i - x_i \bar{y} - a_1 \sum_{i=1}^N x_i^2 - x_i \bar{x} = 0$$

$$a_1 = \frac{\sum x_i y_i - \sum x_i \sum y_i}{N}$$

$$\frac{\sum x_i^2 - \frac{(\sum x_i)^2}{N}}{N}$$



6.B

$$\frac{\partial \chi^2}{\partial a_0} = -2 \sum_{i=1}^N y_i - a_0 - a_1 x_i - a_2 x_i^2 = 0$$

$$\sum_{i=1}^N \left[ y_i = a_0 + a_1 x_i + a_2 x_i^2 \right]$$

$$\frac{\partial \chi^2}{\partial a_1} = -2 \sum_{i=1}^N x_i y_i - x_i a_0 - a_1 x_i^2 - a_2 x_i^3 = 0$$

$$\sum_{i=1}^N \left[ x_i y_i = a_0 x_i + a_1 x_i^2 + a_2 x_i^3 \right]$$

$$\frac{\partial \chi^2}{\partial a_2} = -2 \sum_{i=1}^N x_i^2 y_i - a_0 x_i^2 - a_1 x_i^3 - a_2 x_i^4 = 0$$

$$\sum_{i=1}^N \left[ x_i^2 y_i = a_0 x_i^2 + a_1 x_i^3 + a_2 x_i^4 \right]$$

$$\text{Como } \chi^2(a_0, \dots, a_m) = \sum_{i=1}^N (y_i - a_0 - a_1 x_i - \dots - a_m x_i^m)^2,$$

$$\frac{\partial \chi^2}{\partial a_m} = -2 \sum_{i=1}^N x_i^m (y_i - a_0 - a_1 x_i - \dots - a_m x_i^m) y_i, \dots$$

$$\sum_{i=1}^N \left[ x_i^m y_i = a_0 x_i^m + a_1 x_i^{m+1} + \dots + a_m x_i^{m+m} \right]$$