Punto 6.1

$$\chi(a_0, a_1) = \sum_{i=1}^{n} \left(y_i - (a_0 + a_1 x_i)\right)^2$$

$$\frac{\partial \chi}{\partial a_1} = 0 = \frac{\partial}{\partial a_0} \sum_{i=1}^{n} y_i^2 - 2y_i(a_0 + a_i x_i) + (a_0 + a_1 x_i)^2$$

$$0 = \frac{\partial}{\partial a_0} \sum_{i=1}^{n} y_i^2 - 2y_i(a_0 + a_1 x_i) + a_0^2 + 2a_0 a_1 x_i + a_1^2 x_i^2$$

$$0 = \sum_{i=1}^{n} -2y_i + 2a_0 + 2a_1 x_i$$

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

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

$$n a_0 = \sum_{i=1}^{n} y_i + a_1 x_i$$

$$a_0 = \frac{\sum_{i=1}^{n} y_i + a_1 x_i}{n}$$

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

$$\frac{\partial X}{\partial a_1} = 0 = \frac{\partial X}{\partial a_1} \sum_{i=1}^{n} y_i^2 - 2y_i(a_0 + a_1 x_i) + a_0^2 + 2a_0 a_1 x_i + a_1^2 x_i^2$$

$$0 = \frac{\partial X}{\partial a_1} \sum_{i=1}^{n} y_i^2 - 2y_i(a_0 + a_1 x_i) + 2a_0 a_1 x_i + a_1^2 x_i^2$$

$$0 = \sum_{i=1}^{n} -2y_i x_i + 2a_0 x_i + 2a_1 x_i^2$$

$$0 = \Sigma(-2yx + 2a_0 x + 2a_1 x^2)$$

$$0 = \Sigma(2a_0 x + 2a_1 x^2 - 2yx)$$

$$0 = \Sigma a_0 x + \Sigma a_1 x^2 - \Sigma xy$$

$$0 = a_0 \Sigma x + a_1 \Sigma x^2 - \Sigma xy$$

$$0 = \frac{\Sigma x \Sigma y}{n} - \frac{(\Sigma x)^2}{n} a_1 + a_1 \Sigma x^2 - \Sigma xy$$

$$a_1 \left(\frac{(\Sigma x)^2}{n} + \Sigma x^2 \right) = \Sigma xy - \frac{\Sigma x \Sigma y}{n}$$

$$a_1 = \frac{\Sigma xy - \frac{\Sigma x \Sigma y}{n}}{\left(\Sigma x^2 - \frac{(\Sigma x)^2}{n} \right)}$$