

$$\begin{aligned}
 & \varphi(x) = a_0 + a_1 \cdot x \\
 & S^2(a_0, a_1) = \sum_{i=1}^n (y_i - \varphi(x_i))^2 \rightarrow \min \\
 & = \sum_{i=1}^n (y_i - a_0 - a_1 \cdot x_i)^2 \\
 & \begin{cases} \frac{\partial S^2}{\partial a_0} = -2 \sum_{i=1}^n (y_i - a_0 - a_1 x_i) = 0 \\ \frac{\partial S^2}{\partial a_1} = -2 \sum_{i=1}^n (y_i - a_0 - a_1 x_i) x_i = 0 \end{cases}
 \end{aligned}$$

Скоротим на  $n+2$ : не перетворюємо під знаком

$$\begin{cases} a_0 \cdot n + a_1 \cdot \sum_{i=1}^n x_i = \sum_{i=1}^n y_i \\ a_0 \cdot \sum_{i=1}^n x_i + a_1 \cdot \sum_{i=1}^n x_i^2 = \sum_{i=1}^n y_i x_i \end{cases}$$

$$\sum a_0 \cdot 1 = a_0 \sum 1 = a_0 n$$

$$2) y = a_0 + a_1 \cdot \ln x$$

$$X = \ln(x) \quad y = a_0 + a_1 \cdot X$$

$$[y_i], [x_i] \rightarrow [\ln x_i] \quad i=1-n$$

$$3) y = a_0 + a_1 \cdot \frac{1}{x}$$

$$X = \frac{1}{x} \quad y = a_0 + a_1 \cdot X$$

$$[y_i], [x_i] \rightarrow [\frac{1}{x_i}] \quad i=1-n$$

$$4) y = a_0 \cdot a_1^x$$

$$\ln y = \ln(a_0 a_1^x) = \ln a_0 + \ln a_1^x = \ln a_0 + x \cdot \ln a_1$$

$$y = \ln y \quad A_0 = \ln a_0 \quad A_1 = \ln a_1 \quad y = A_0 + A_1 X$$

$$[x_i], [y_i] \rightarrow [\ln y_i] \quad i=1-n$$

$$a_0 = e^{A_0} \quad a_1 = e^{A_1}$$

$$5) y = a_0 x^{a_1}$$

$$\ln y = \ln a_0 \cdot x^{a_1} = \ln a_0 + \ln x^{a_1} = \ln a_0 + a_1 \cdot \ln(x)$$

$$y = \ln y \quad X = \ln x \quad A_0 = \ln a_0 \quad y = A_0 + A_1 X$$

$$[y_i] \rightarrow [\ln y_i], [x_i] \rightarrow [\ln x_i] \quad a_0 = e^{A_0}$$

$$6) y = e^{a_0 + \frac{a_1}{x}}$$

$$\ln y = \ln e^{a_0 + \frac{a_1}{x}} = a_0 + \frac{a_1}{x}$$

$$y = \ln y \quad X = \frac{1}{x} \quad y = a_0 + a_1 \cdot X$$

$$[y_i] \rightarrow [\ln y_i], [x_i] \rightarrow [\frac{1}{x_i}] \quad i=1-n$$

$$7) y = \frac{1}{a_0 + a_1 x}$$

$$\frac{1}{y} = a_0 + a_1 x$$

$$y = \frac{1}{y} \quad y = a_0 + a_1 x$$

$$[x_i], [y_i] \rightarrow [\frac{1}{y_i}]$$

$$8) y = \frac{1}{a_0 + a_1 \ln x}$$

$$\frac{1}{y} = a_0 + a_1 \ln x$$

$$y \neq 1 \quad X = \ln x \quad y = a_0 + a_1 X$$

$$[x_i] \rightarrow [\ln x_i], [y_i] \rightarrow [\frac{1}{y_i}]$$

$$9) y = \frac{x}{a_0 + a_1 x}$$

$$\frac{1}{y} = \frac{a_0 + a_1 x}{x} = a_0 \cdot \frac{1}{x} + a_1$$

$$y \neq 1 \quad X = \frac{1}{x} \quad y = a_0 X + a_1$$

$$y = a_0 + a_1 X \quad a_0 = f_1 \quad a_1 = f_0$$

$$[y_i] \rightarrow [\frac{1}{y_i}] \quad [x_i] \rightarrow [\frac{1}{x_i}]$$