

Indexing expressions in Grapher 2.1

Coefficients are functions of the index.

example for two coefficients :

$$\begin{aligned}
 a(i) &= 0,5i - 2 \\
 b(i) &= -3i + 1 \\
 f(i) &= a(i)x + b(i) \\
 y = f(0) & \quad \text{that is } y = -2x + 1 \\
 y = f(1) & \quad \ll \ll y = -1,5x - 2 \\
 y = f(2) & \quad \ll \ll y = -x - 5 \\
 & \text{etc.}
 \end{aligned}$$

Each coefficient is function of his own index.

example for three coefficients :

$$\begin{aligned}
 a(i) &= 0,5i - 2 \\
 b(j) &= -3j + 1 \\
 c(k) &= k \\
 f(i, j, k) &= a(i)x + b(j) + c(k) \\
 y = f(0, 0, 0) & \quad \text{that is } y = -2x + 1 \\
 y = f(1, 0, 1) & \quad \ll \ll y = -1,5x + 2 \\
 y = f(2, 1, 2) & \quad \ll \ll y = -x \\
 & \text{etc.}
 \end{aligned}$$

Coefficient are not functions (maximum : 3).

we already tried Grapher matrices for three or less coefficients. Example :

$$\begin{aligned}
 A &= \left\{ \begin{bmatrix} -1 \\ 1 \end{bmatrix}, \begin{bmatrix} 2 \\ 3 \end{bmatrix}, \begin{bmatrix} 4 \\ 2 \end{bmatrix} \right\} && \text{3 pairs of coefficients in 3 matrices } 2 \times 1 \\
 y &= A^T \cdot \begin{bmatrix} x \\ 1 \end{bmatrix} && \text{3 equations } y = ax + b
 \end{aligned}$$

Coefficient are not functions (more than 3).

using your second solution may be easier that way (copy - paste is useful !)

$$\begin{aligned}
 a_1 &= -1 \\
 a_2 &= 2 \\
 a_3 &= 4 \\
 b_1 &= 1 \\
 b_2 &= 3 \\
 b_3 &= 2 \\
 y &= a_1x + b_1 \\
 y &= a_2x + b_2 \\
 y &= a_3x + b_3
 \end{aligned}$$

many lines but less signs and very easy to type.

But don't you think it's better to write straight the 3 or more equations $y = -1x + 1$ etc. ?

Grapher and indices.

Grapher shows indices in three places :

- coefficients of regression polynomial equations a_1 to a_N but we cannot use their names in other expressions ;
- in series equations there is one index for the two or three coordinates ; in a 2D window, a serie plots only points, not curves ;
- when using the signs :

$$\sum_{i=1}^n \quad \prod_{i=1}^n$$

Unfortunately we can't use the point sets data, they don't have indices, and matrices are 3x3 maximum.