

PROGRAMMING



quicksheets

Mathsoft Controls: Fitting a Model Function to Data

You can use this worksheet to test how well your data is modeled by a linear, quadratic, or exponential function.

Step 1: Enter your data in the table below or import it from a file by right-clicking on the table and choosing **Import** from the menu.

data :=

	0	1
0	1	2
1	2	4
2	3	6
3	4	10

Step 2: Choose the model that you think best fits your data.

- linear
  quadratic
  exponential

Step 3: If you selected the exponential fit, please provide guess values for the parameters, a, b, and c, in the model function,  $y = a \cdot e^{b \cdot x} + c$ .

a := 
 b := 
 c :=

fit calculations

X := data<0>

Y := data<1>

Linear Fit

Quadratic Fit

Exponential Fit

int := intercept(X, Y) k := 2

A := if (a = "", 0, a)

m := slope(X, Y)

z := regress(X, Y, k)

B := if (b = "", 0, b)

F(x) := int + m · x

G(x) := interp(z, X, Y, x)

C := if (c = "", 0, c)

$$z = \begin{pmatrix} 3 \\ 3 \\ 2 \\ 1.5 \\ 0.1 \\ 0.5 \end{pmatrix}$$

$$\text{guess} := \begin{pmatrix} A \\ B \\ C \end{pmatrix}$$

$$E := \text{expfit}(X, Y, \text{guess})$$

$$\underline{H}(x) := E_0 \cdot e^{E_1 \cdot x} + E_2$$


$$\text{fit}(x) := \text{if}(\text{sel1} = 1, F(x), \text{if}(\text{sel1} = 2, G(x), H(x)))$$

$$\text{param}_a := E_0 \quad \text{param}_b := E_1 \quad \text{param}_c := E_2$$

$$\underline{a} := \text{if}(\text{sel1} = 1, \text{int}, \text{if}(\text{sel1} = 2, z_3, E_0))$$

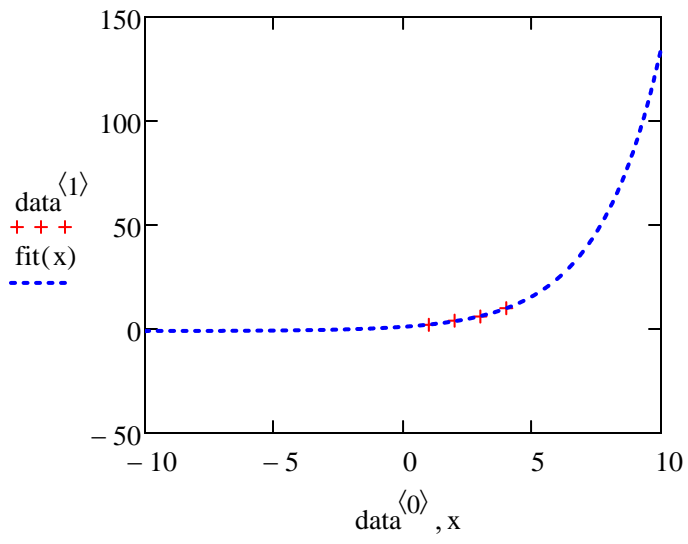
$$\underline{b} := \text{if}(\text{sel1} = 1, \text{m}, \text{if}(\text{sel1} = 2, z_4, E_1))$$

$$\underline{c} := \text{if}(\text{sel1} = 1, \text{"NA"}, \text{if}(\text{sel1} = 2, z_5, E_2))$$

 fit calculations

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**Step 4:** View the data and your fit on the same set of axes. How well does the model you have chosen seem to fit the data?



$$a = 2.043$$

$$b = 0.42$$

$$c = -0.993$$

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