Excel > Function reference > Statistical

GROWTH

⊟ Hide All

Calculates predicted exponential growth by using existing data. GROWTH returns the y-values for a series of new x-values that you specify by using existing x-values and y-values. You can also use the GROWTH worksheet function to fit an exponential curve to existing x-values and y-values.

Syntax

GROWTH(**known_y's**,known_x's,new_x's,const)

Known_y's   is the set of y-values you already know in the relationship $y = b*m^x$.

- If the array known_y's is in a single column, then each column of known_x's is interpreted as a separate variable.

- If the array known_y's is in a single row, then each row of known_x's is interpreted as a separate variable.

- If any of the numbers in known_y's is 0 or negative, GROWTH returns the #NUM! error value.

Known_x's   is an optional set of x-values that you may already know in the relationship $y = b*m^x$.

- The array known_x's can include one or more sets of variables. If only one variable is used, known_y's and known_x's can be ranges of any shape, as long as they have equal dimensions. If more than one variable is used, known_y's must be a vector (that is, a range with a height of one row or a width of one column).

- If known_x's is omitted, it is assumed to be the array {1,2,3,...} that is the same size as known_y's.

New_x's   are new x-values for which you want GROWTH to return corresponding y-values.

- New_x's must include a column (or row) for each independent variable, just as known_x's does. So, if known_y's is in a single column, known_x's and new_x's must have the same number of columns. If known_y's is in a single row, known_x's and new_x's must have the same number of rows.

- If new_x's is omitted, it is assumed to be the same as known_x's.

- If both known_x's and new_x's are omitted, they are assumed to be the array {1,2,3,...} that is the same size as known_y's.

Const   is a logical value specifying whether to force the constant b to equal 1.

- If const is TRUE or omitted, b is calculated normally.

- If const is FALSE, b is set equal to 1 and the m-values are adjusted so that $y = m^x$.
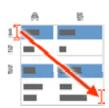
Remarks

- Formulas that return arrays must be entered as array formulas after selecting the correct number of cells.

- When entering an array constant for an argument such as known_x's, use commas to separate values in the same row and semicolons to separate rows.

Example

The example may be easier to understand if you copy it to a blank worksheet.

⊟ How to copy an example

1. Create a blank workbook or worksheet.

2. Select the example in the Help topic.

   | NOTE | Do not select the row or column headers.

   Selecting an example from Help

3. Press CTRL+C.

4. In the worksheet, select cell A1, and press CTRL+V.

5. To switch between viewing the results and viewing the formulas that return the results, press CTRL+` (grave accent), or on the **Formulas** tab, in the **Formula Auditing** group, click the **Show Formulas** button.

This example uses the same data as the LOGEST example. The first formula shows corresponding values to the known values. The second formula predicts the next months values, if the exponential trend continues.

	A	B	C
1	**Month**	**Units**	**Formula (Corresponding Units)**
2	11	33,100	=GROWTH(B2:B7,A2:A7)
3	12	47,300	
4	13	69,000	

5	14	102,000
6	15	150,000
7	16	220,000
	Month	**Formula (Predicted Units)**
	17	=GROWTH(B2:B7,A2:A7, A9:A10)
	18	

NOTE   The formula in the example must be entered as an array formula. After copying the example to a blank worksheet, select the range C2:C7 or B9:B10 starting with the formula cell. Press F2, and then press CTRL+SHIFT+ENTER. If the formula is not entered as an array formula, the single results are 32618.20377 and 320196.7184.

See Also

- LINEST
- LOGEST
- Statistical functions
- TREND