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Excel > Function reference > Statistical

# **TREND**

■ Hide All

Returns values along a linear trend. Fits a straight line (using the method of least squares) to the arrays known\_y's and known\_x's. Returns the y-values along that line for the array of new\_x's that you specify.

## **Syntax**

TREND(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 = mx + b.

- 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.

**Known\_x's** is an optional set of x-values that you may already know in the relationship y = mx + b.

- 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 TREND 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 you omit new\_x's, it is assumed to be the same as known\_x's.
- If you omit both known\_x's and new\_x's, 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 0.

- If const is TRUE or omitted, b is calculated normally.
- If const is FALSE, b is set equal to 0 (zero), and the m-values are adjusted so that y = mx.

### Remarks

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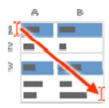
- For information about how Microsoft Excel fits a line to data, see LINEST.
- You can use TREND for polynomial curve fitting by regressing against the same variable raised to different powers. For example, suppose column A contains y-values and column B contains x-values. You can enter x^2 in column C, x^3 in column D, and so on, and then regress columns B through D against column A.
- Formulas that return arrays must be entered as array formulas.
- 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.

The first formula shows corresponding values to the known values. The second formula predicts the next months values, if the linear trend continues.

	Α	В	С
1	Month	Cost	Formula (Corresponding Cost)
2	1	\$133,890	=TREND(B2:B13,A2:A13)
3	2	\$135,000	

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4	3	\$135,790
5	4	\$137,300
6	5	\$138,130
7	6	\$139,100
8	7	\$139,900
9	8	\$141,120
10	9	\$141,890
11	10	\$143,230
12	11	\$144,000
13	12	\$145,290
13	12 Month	
13		
13	Month	Formula (Predicted Cost)
13	Month 13	Formula (Predicted Cost)
13	<b>Month</b> 13 14	Formula (Predicted Cost)

**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:C13 or B15:B19 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 133953.3333 and 146171.5152.

### See Also

- GROWTH
- LINEST
- LOGEST
- Statistical functions