

How can I extrapolate data in Excel?

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Extrapolation in Excel refers to the process of estimating unknown values based on existing data points. This can be done by using mathematical formulas or regression analysis to determine a relationship between the known data points and the unknown values. Excel provides various tools and functions such as trendlines, FORECAST, and TREND, which allow users to extrapolate data and make predictions. By inputting the known data points and using these tools, users can generate a trendline or equation that can be used to estimate values for new data points. This can be useful in analyzing trends, making projections, and forecasting future outcomes. However, it is important to note that extrapolated data should be interpreted with caution as it is based on assumptions and may not always be accurate.

Extrapolate Data in Excel (With Example)

Extrapolation is the process of using historical data values to predict future values.

The easiest way to extrapolate data in Excel is by using the TREND function, which uses the following syntax:

TREND(known_y's, , ,)

where:

known_y's: The range of known y-values
known_x's: The range of known x-values
new_x's: The range of new x-values
const: Whether to force the constant in the trendline equation to be zero.

Note: The TREND function is designed to be used with data that follows a linear trend. For datasets that exhibit

a nonlinear trend, you should use .

The following step-by-step example shows how to use the TREND function to extrapolate data in practice in Excel.

Step 1: Create the Dataset

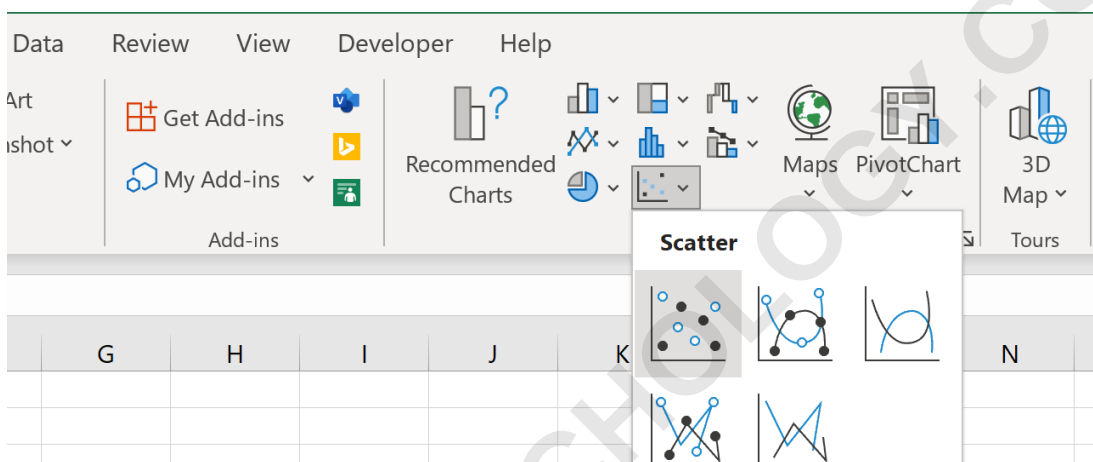
First, let's enter the values for the following dataset into Excel:

	A	B	C	D	E	F
1	x	y				
2	1	4				
3	3	7				
4	6	8				
5	7	8				
6	8	10				
7	10	12				
8	13	16				
9	15	15				
10	17	17				
11	18	19				
12	18	24				
13	20	20				
14	22	26				
15						
16						
17						
18						

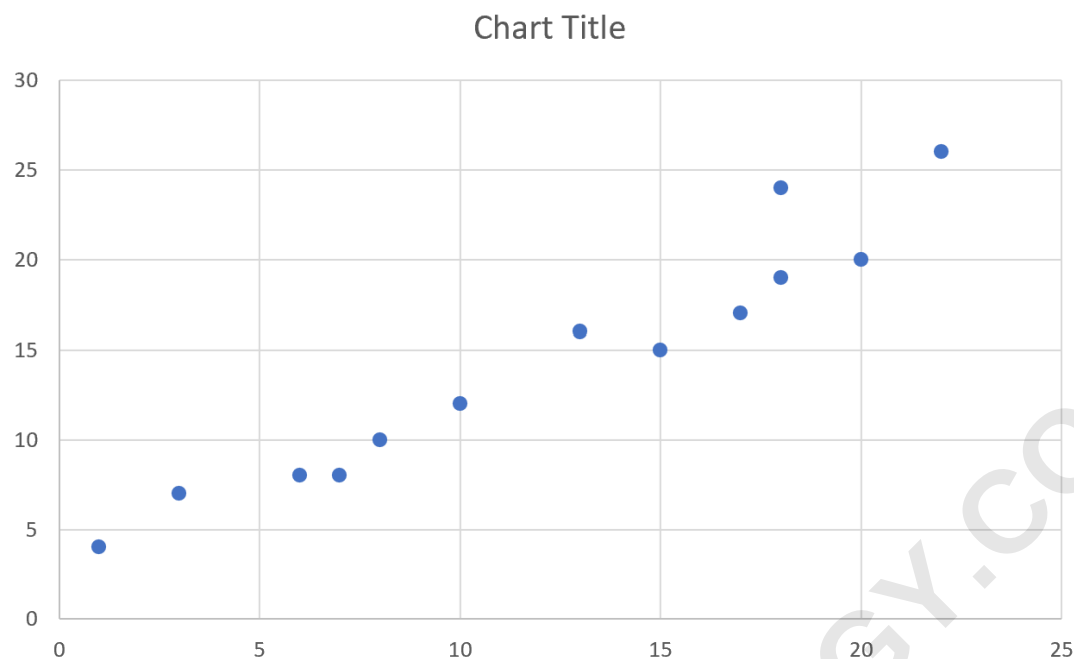
Step 2: Check if the Data Follows a Linear Trend

Next, let's create a scatter plot to check if the data follows a linear trend.

To do so, highlight the range A2:B14, then click the Insert tab along the top ribbon, then click the Scatter icon in the Charts group:



The following scatter plot will appear:



From the plot we can see that the points roughly follow a linear trend.

Thus, we can proceed to use the TREND function to extrapolate future data values.

Note: If the data exhibits a nonlinear pattern, you may try instead.

Step 3: Use TREND Function to Extrapolate New Values

Suppose we would like to use our existing data to extrapolate the y-values for the following new x-values:

$$x = 25 \quad x = 30 \quad x = 35$$

To do so, we can define these new values in our worksheet and then type the following formula into cell B17:

=TREND(\$B\$2:\$B\$14, \$A\$2:\$A\$14, A17)

We can then click and drag this formula down to each of the new values:

B17		=TREND(\$B\$2:\$B\$14, \$A\$2:\$A\$14, A17)					
	A	B	C	D	E	F	G
1	x	y					
2		1	4				
3		3	7				
4		6	8				
5		7	8				
6		8	10				
7		10	12				
8		13	16				
9		15	15				
10		17	17				
11		18	19				
12		18	24				
13		20	20				
14		22	26				
15							
16	new x	new y					
17	25	26.75229					
18	30	31.596					
19	35	36.43971					
20							

Here is how to interpret the output:

For a value of $x = 25$, the forecasted value of y is 26.75229. For a value of $x = 30$, the forecasted value of y is 31.596. For a value of $x = 35$, the forecasted value of y is 36.43971.

If you would like to know the exact formula used to extrapolate these values, you can type the following formula into cell D2:

=LINEST(A2:A14, B2:B14)

The following screenshot shows how to use this formula in practice:

D2	⌵	:	✕	✓	<i>fx</i>	=LINEST(B2:B14, A2:A14)	
	A	B	C	D	E	F	
1	x	y					
2		1	4	0.968741	2.533759		
3		3	7				
4		6	8				
5		7	8				
6		8	10				
7		10	12				
8		13	16				
9		15	15				
10		17	17				
11		18	19				
12		18	24				
13		20	20				
14		22	26				
15							
16	new x	new y					
17		25	26.75229				
18		30	31.596				
19		35	36.43971				
20							

The LINEST function calculates the linear trendline for the existing data, which turns out to be:

$$y = 0.968741x + 2.533759$$

The TREND function uses this equation under the hood to extrapolate the y-values.

For example, for a value of $x = 25$, the equation calculates the following:

$$y = 0.968741*(25) + 2.533759 = 26.75229$$

This matches the value calculated by the TREND function.

The following tutorials explain how to perform other common tasks in Excel:

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