

How can I perform nonlinear regression in Excel?

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Nonlinear regression is a statistical method used to model and analyze nonlinear relationships between variables. Excel, a popular spreadsheet software, offers a built-in tool for performing nonlinear regression. To perform this analysis in Excel, the user needs to first determine the type of nonlinear relationship between the variables and choose an appropriate regression model. The data should then be organized in a table format and the nonlinear regression tool can be accessed through the Data Analysis tab. The tool will require the input of the variables and the chosen regression model. Once the analysis is completed, Excel will generate the regression equation and a visual representation of the relationship between the variables in the form of a graph. This allows for the interpretation and prediction of data that follows a nonlinear trend.

Perform Nonlinear Regression in Excel (Step-by-Step)

Nonlinear regression is a regression technique that is used when the relationship between a predictor variable and a does not follow a linear pattern.

The following step-by-step example shows how to perform nonlinear regression in Excel.

Step 1: Create the Data

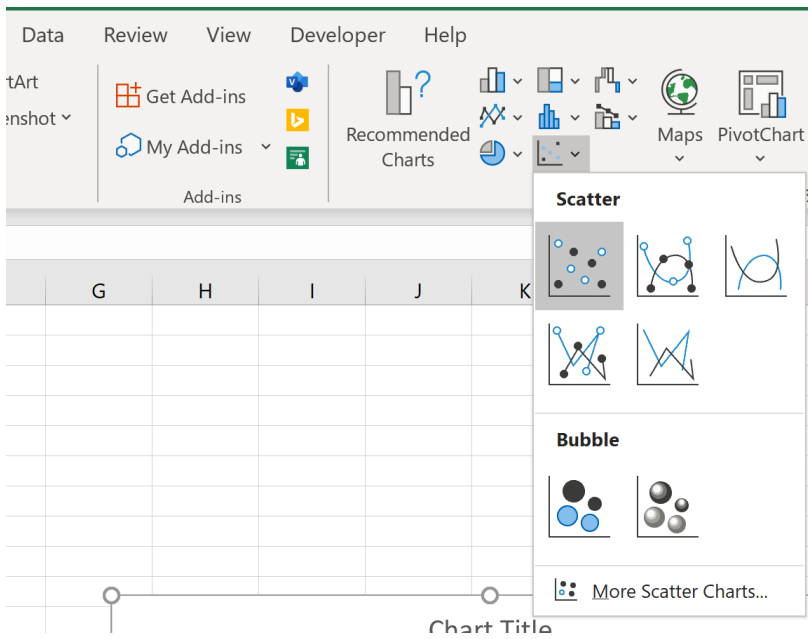
First, let's create a dataset to work with:

	A	B	C	D	E	F	G	H
1	x	y						
2	1	3						
3	2	13						
4	3	22						
5	4	25						
6	5	18						
7	6	10						
8	7	7						
9	8	5						
10	9	5						
11	10	7						
12	11	9						
13	12	13						
14	13	18						
15	14	23						
16	15	27						
17	16	33						
18	17	39						
19	18	48						
20	19	58						
21	20	70						
22								
23								
24								
25								
26								

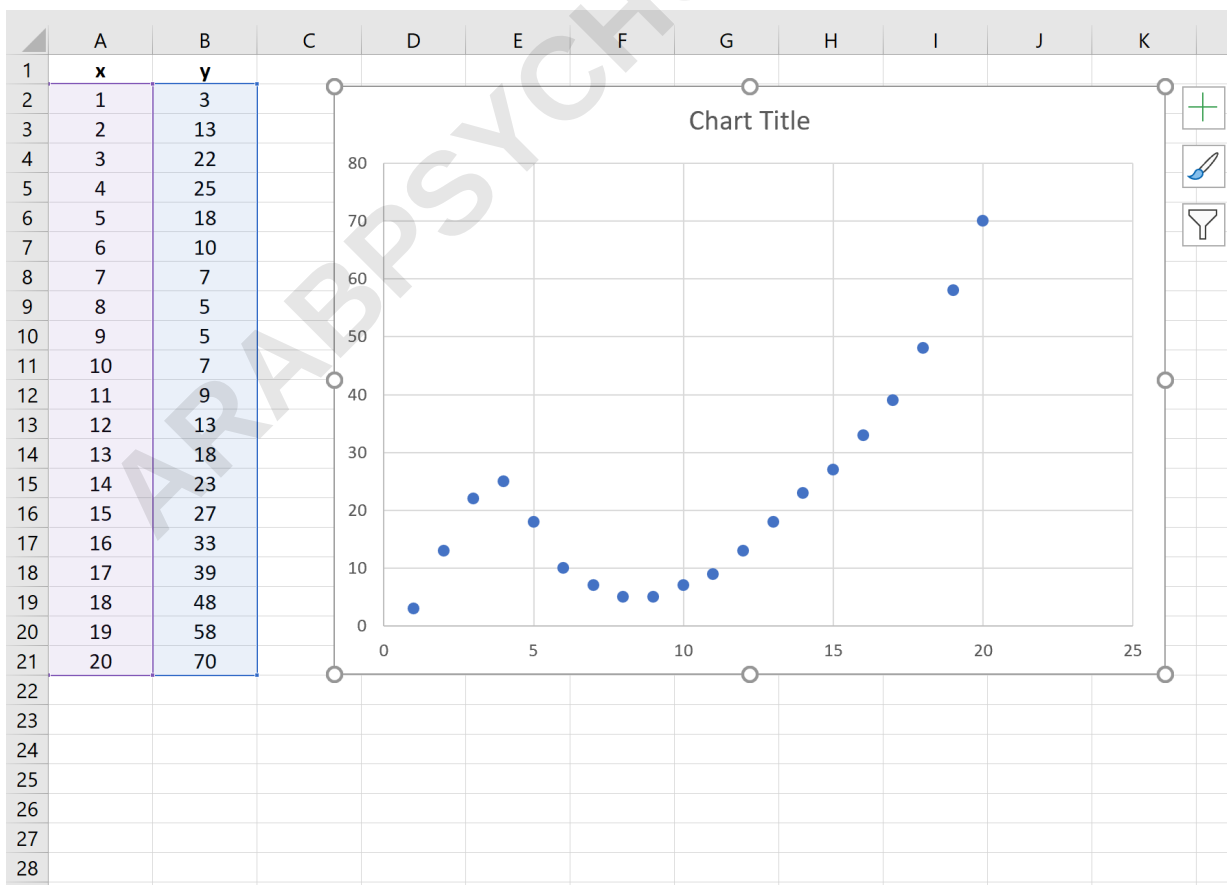
Step 2: Create a Scatterplot

Next, let's create a scatterplot to visualize the data.

First, highlight the cells in the range A1:B21. Next, click the Insert tab along the top ribbon, and then click the first plot option under Scatter:

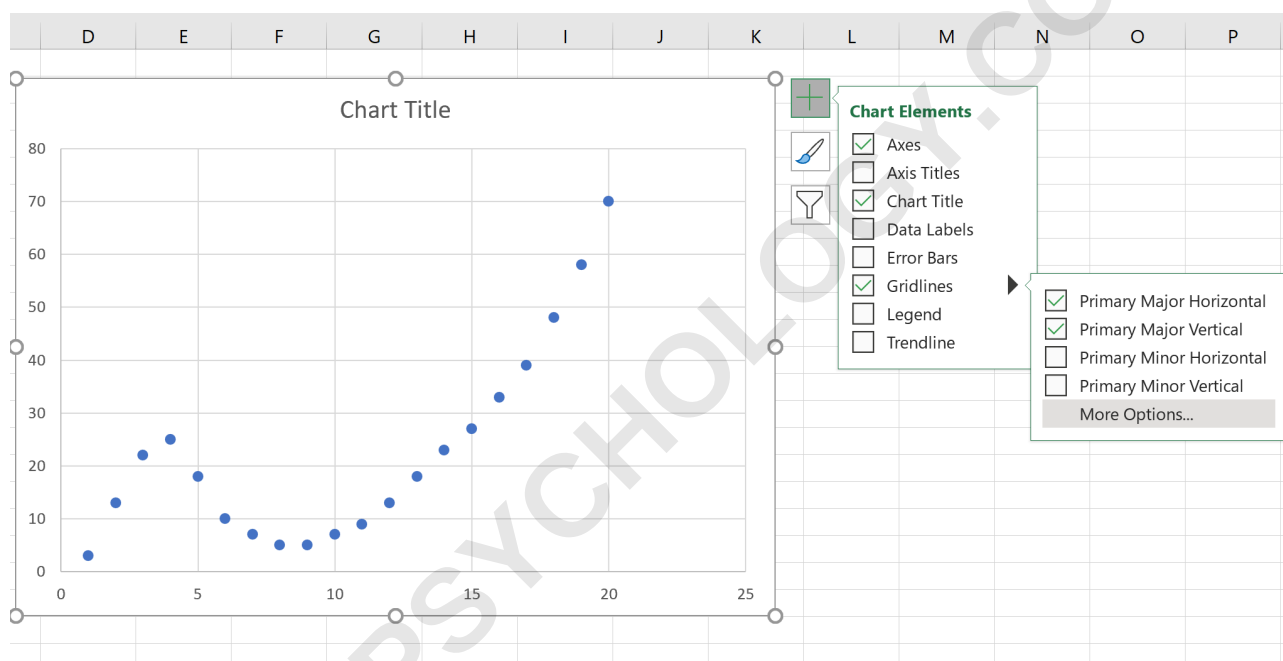


The following scatterplot will appear:

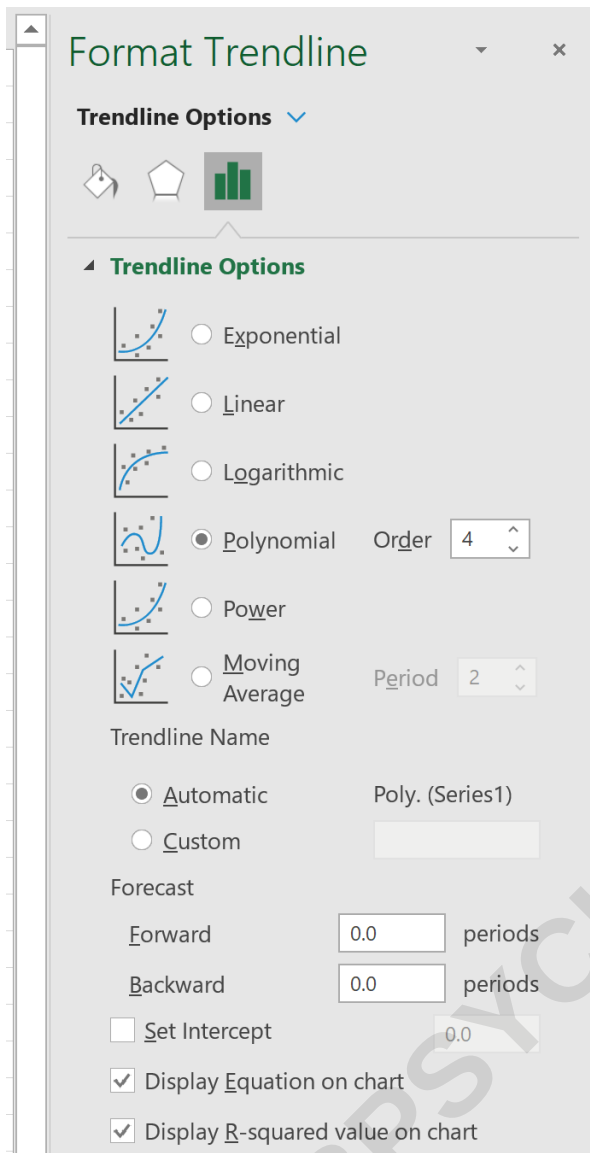


Step 3: Add a Trendline

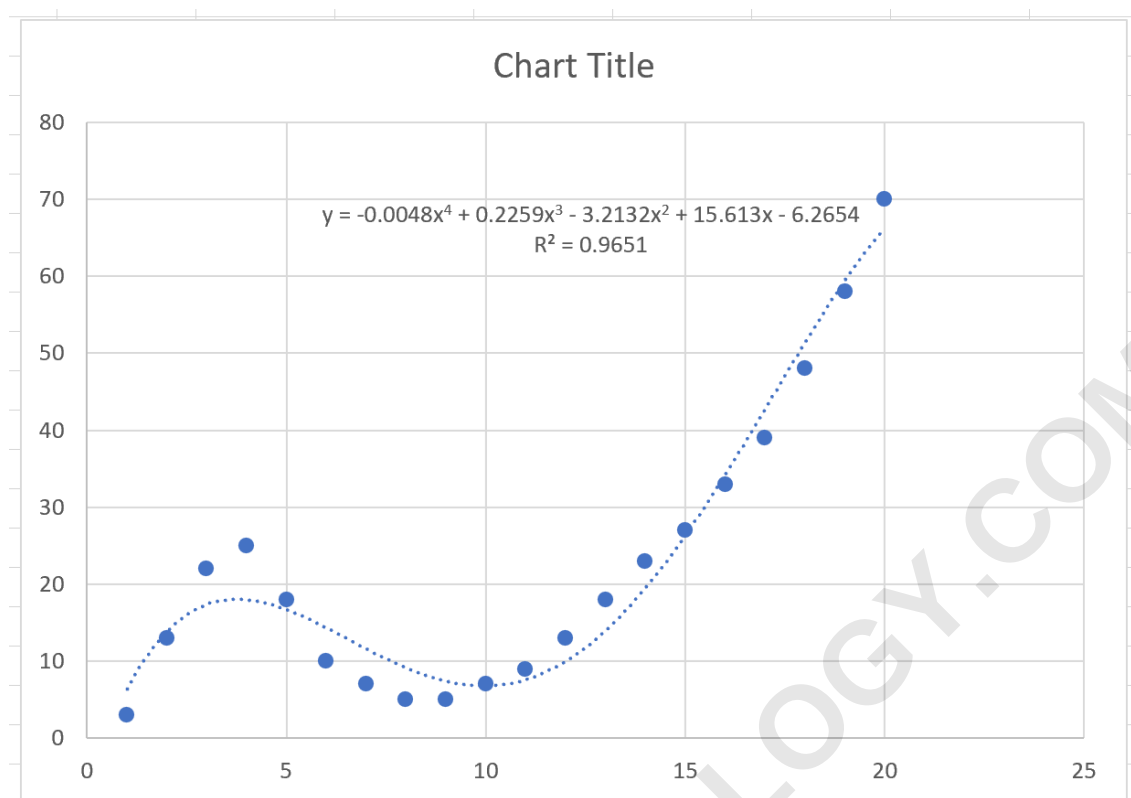
Next, click anywhere on the scatterplot. Then click the **+** sign in the top right corner. In the dropdown menu, click the arrow next to **Trendline** and then click **More Options**:



In the window that appears to the right, click the button next to **Polynomial**. Then check the boxes next to **Display Equation on chart** and **Display R-squared value on chart**.



This produces the following curve on the scatterplot:



Note that you may need to experiment with the value for the Order of the polynomial until you find the curve that best fits the data.

Step 4: Write the Regression Equation

From the plot we can see that the equation of the regression line is as follows:

$$y = -0.0048x^4 + 0.2259x^3 - 3.2132x^2 + 15.613x - 6.2654$$

The tells us the percentage of the variation in the response variable that can be explained by the

predictor variables.

The R-squared for this particular curve is 0.9651. This means that 96.51% of the variation in the response variable can be explained by the predictor variables in the model.

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