

How do I calculate a sigmoid function in Excel?

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The process of calculating a sigmoid function in Excel involves using the "Sigmoid" formula, which is a mathematical function that maps the input data to a value between 0 and 1. This function is commonly used in data analysis, statistics, and machine learning. To calculate a sigmoid function in Excel, one must first input the data values into a column or row, then use the "Sigmoid" formula to calculate the corresponding output values. This function can be useful in analyzing and visualizing data trends and patterns. By following this method, one can easily calculate the sigmoid function in Excel for various data sets.

Calculate a Sigmoid Function in Excel

A is a mathematical function that has an "S" shaped curve when plotted.

The most common example of a sigmoid function is the logistic sigmoid function, which is calculated as:

$$F(x) = 1 / (1 + e^{-x})$$

To calculate the value of a sigmoid function for a given x value in Excel, we can use the following formula:

$$=1/(1+EXP(-A1))$$

This formula assumes the x value is located in cell A1.

The following example shows how to use this formula in practice.

Example: Calculate Sigmoid Function in Excel

Suppose we have the following list of x values in a column in Excel:

	A	B	C	D	E	F
1	x					
2	-5					
3	-4.5					
4	-4					
5	-3.5					
6	-3					
7	-2.5					
8	-2					
9	-1.5					
10	-1					
11	-0.5					
12	0					
13	0.5					
14	1					
15	1.5					
16	2					
17	2.5					
18	3					
19	3.5					
20	4					
21	4.5					
22	5					
23						
24						

To calculate the value of the sigmoid function for each x value, I can type the following formula into cell B2:

=1/(1+EXP(-A2))

I can then drag this formula down to every remaining cell in column B to calculate the value of the sigmoid

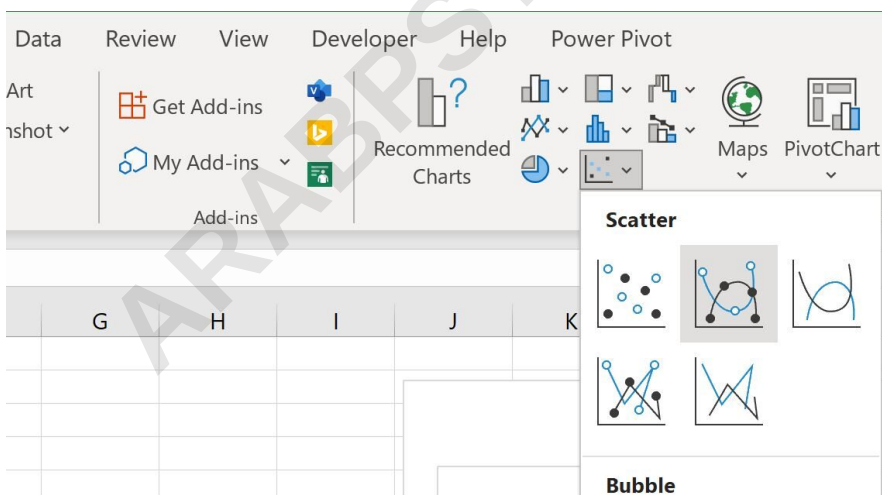
function for each x value:

B2		fx =1/(1+EXP(-A2))						
	A	B	C	D	E	F	G	H
1	x	F(x)						
2	-5	0.006693						
3	-4.5	0.010987						
4	-4	0.017986						
5	-3.5	0.029312						
6	-3	0.047426						
7	-2.5	0.075858						
8	-2	0.119203						
9	-1.5	0.182426						
10	-1	0.268941						
11	-0.5	0.377541						
12	0	0.5						
13	0.5	0.622459						
14	1	0.731059						
15	1.5	0.817574						
16	2	0.880797						
17	2.5	0.924142						
18	3	0.952574						
19	3.5	0.970688						
20	4	0.982014						
21	4.5	0.989013						
22	5	0.993307						
23								
24								

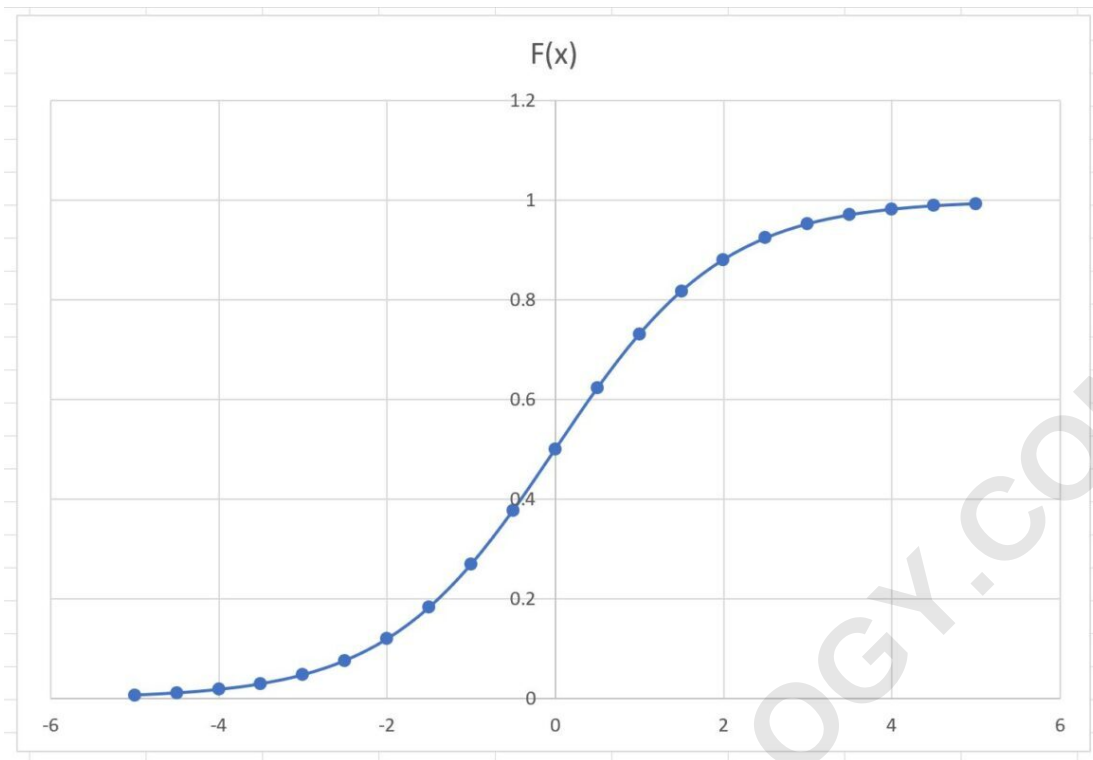
We can then create a line plot to visualize the values of the sigmoid function.

First, highlight every value in column A and B:

	A	B	C	D	E	F	G
1	x	F(x)					
2	-5	0.006693					
3	-4.5	0.010987					
4	-4	0.017986					
5	-3.5	0.029312					
6	-3	0.047426					
7	-2.5	0.075858					
8	-2	0.119203					
9	-1.5	0.182426					
10	-1	0.268941					
11	-0.5	0.377541					
12	0	0.5					
13	0.5	0.622459					
14	1	0.731059					
15	1.5	0.817574					
16	2	0.880797					
17	2.5	0.924142					
18	3	0.952574					
19	3.5	0.970688					
20	4	0.982014					
21	4.5	0.989013					
22	5	0.993307					
23							



Once you click this, the following line chart will appear:



The x-axis displays the x values and the y-axis displays the value of the sigmoid function for each x value.

Notice that the plot exhibits the "S" shaped curve that is characteristic of a sigmoid function.

Additional Resources

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