“How can I plot a Chi-Square distribution in Excel?”

Authored by

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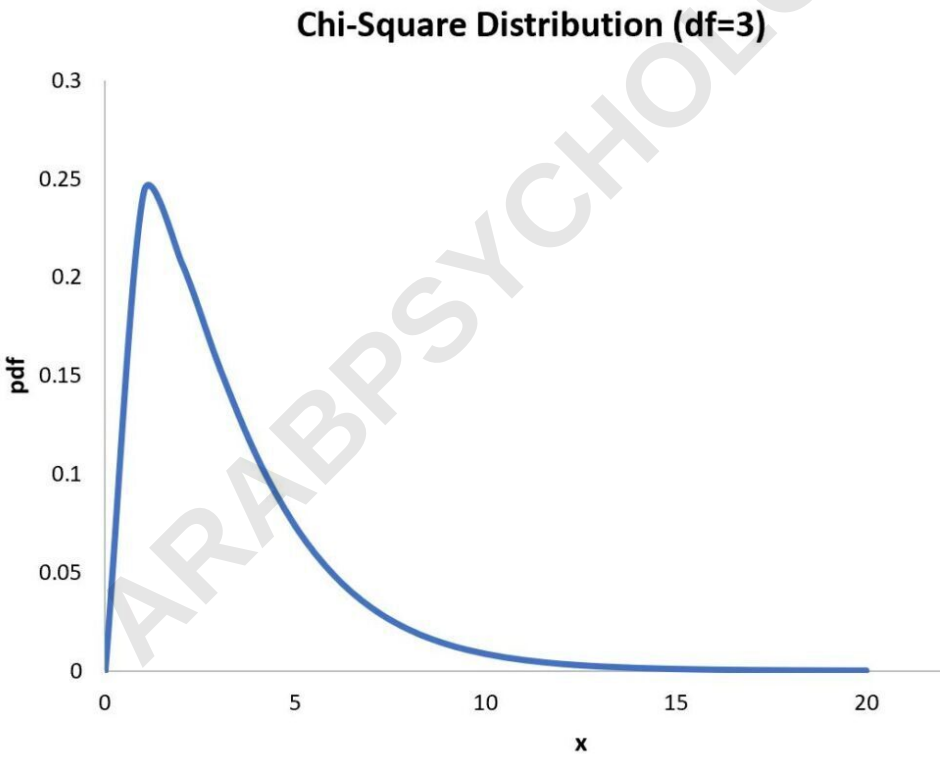
The process of plotting a Chi-Square distribution in Excel involves using the built-in functions and tools available in the software. The Chi-Square distribution is a statistical probability distribution used to analyze categorical data and compare observed values with expected values. To plot this distribution in Excel, one must input the appropriate data and use the CHISQ.DIST function to calculate the values. The resulting values can then be graphed using a scatter plot or a histogram to visualize the distribution. By following these steps, one can effectively plot a Chi-Square distribution in Excel for data analysis purposes.

Plot a Chi-Square Distribution in Excel

This step-by-step tutorial explains how to plot the following Chi-Square distribution in Excel:



Step 1: Define the X Values

First, let's define a range of x-values to use for our plot.

For this example, we'll create a range from 0 to 20:

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

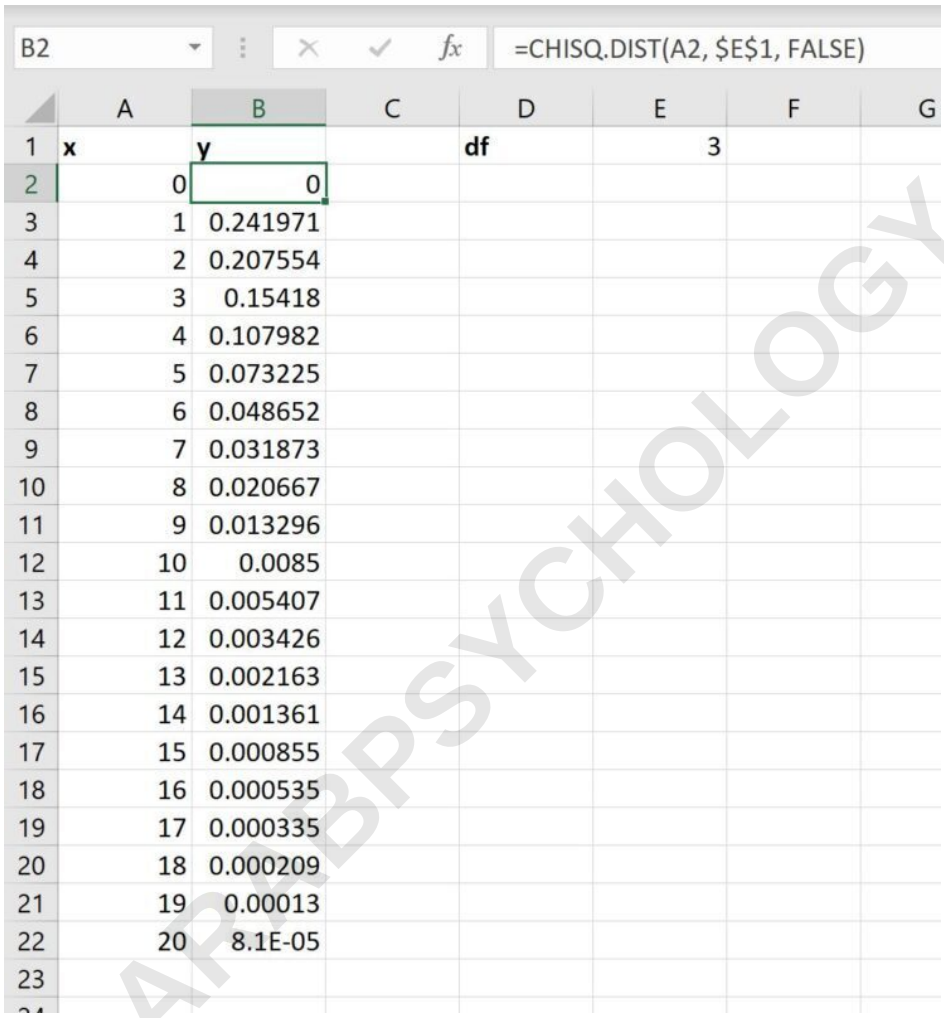
Step 2: Calculate the Y Values

The y values on the plot will represent the PDF values associated with the Chi-Square distribution.

We can type the following formula into cell B2 to calculate the PDF value of the Chi-Square distribution associated with an x value of 0 and a degrees of freedom value of 3:

=CHISQ.DIST(A2, E1, FALSE)

We can then copy and paste this formula down to every remaining cell in column B:

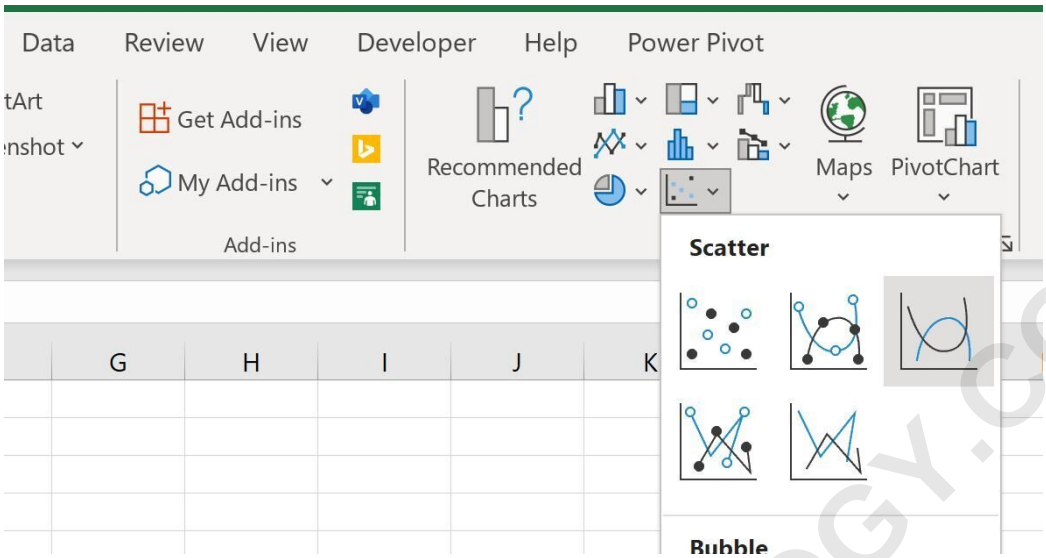


	A	B	C	D	E	F	G
1	x	y		df	3		
2	0	0					
3	1	0.241971					
4	2	0.207554					
5	3	0.15418					
6	4	0.107982					
7	5	0.073225					
8	6	0.048652					
9	7	0.031873					
10	8	0.020667					
11	9	0.013296					
12	10	0.0085					
13	11	0.005407					
14	12	0.003426					
15	13	0.002163					
16	14	0.001361					
17	15	0.000855					
18	16	0.000535					
19	17	0.000335					
20	18	0.000209					
21	19	0.00013					
22	20	8.1E-05					
23							

Step 3: Plot the Chi-Square Distribution

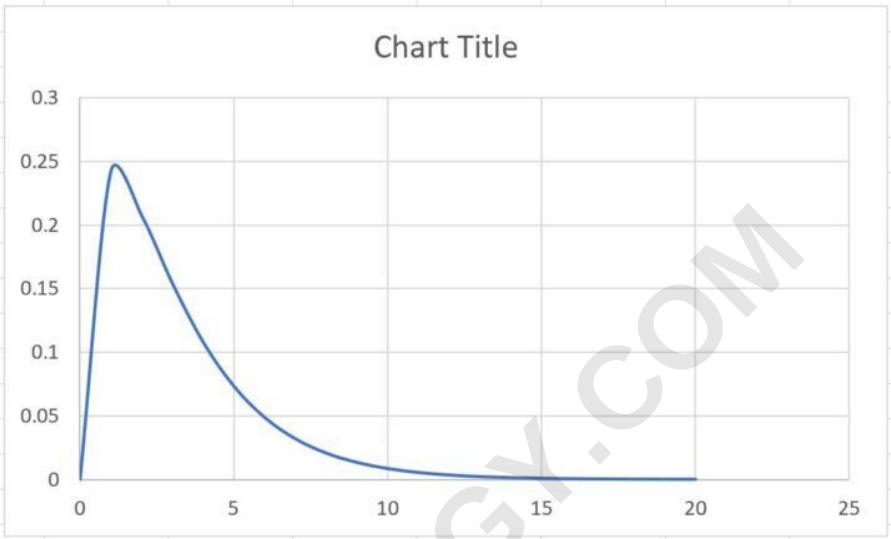
Next, highlight the cell range A2:B22, then click the Insert tab along the top ribbon, then click the Scatter option within the Charts group and click Scatter with

Smooth Lines:



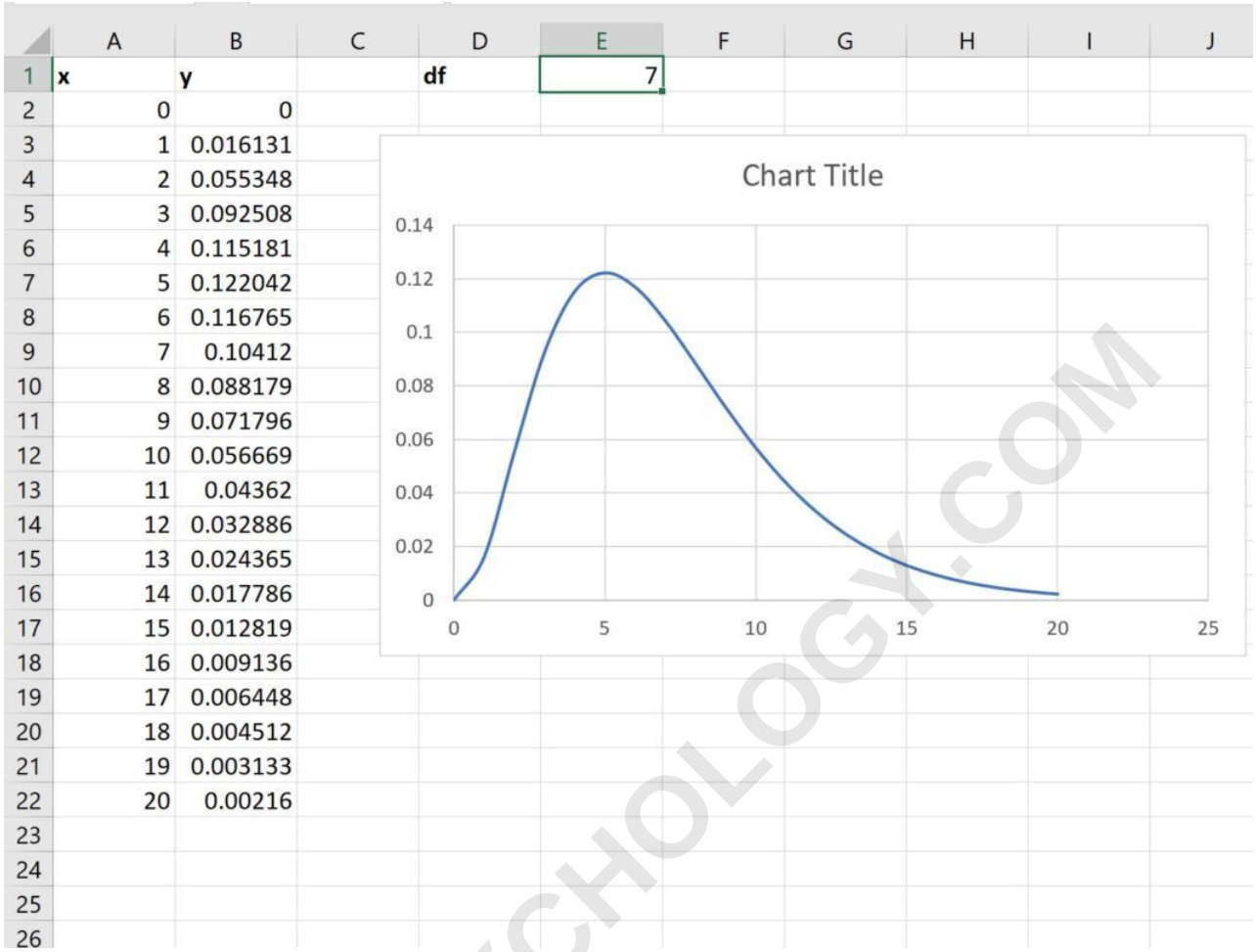
The following chart will be created:

	A	B	C	D	E	F	G	H	I	J
1	x	y		df	3					
2	0	0								
3	1	0.241971								
4	2	0.207554								
5	3	0.15418								
6	4	0.107982								
7	5	0.073225								
8	6	0.048652								
9	7	0.031873								
10	8	0.020667								
11	9	0.013296								
12	10	0.0085								
13	11	0.005407								
14	12	0.003426								
15	13	0.002163								
16	14	0.001361								
17	15	0.000855								
18	16	0.000535								
19	17	0.000335								
20	18	0.000209								
21	19	0.00013								
22	20	8.1E-05								
23										
24										
25										
26										
27										



Note that if you change the value for the degrees of freedom in cell E1, the chart will automatically update.

For example, we could change the degrees of freedom to 7:

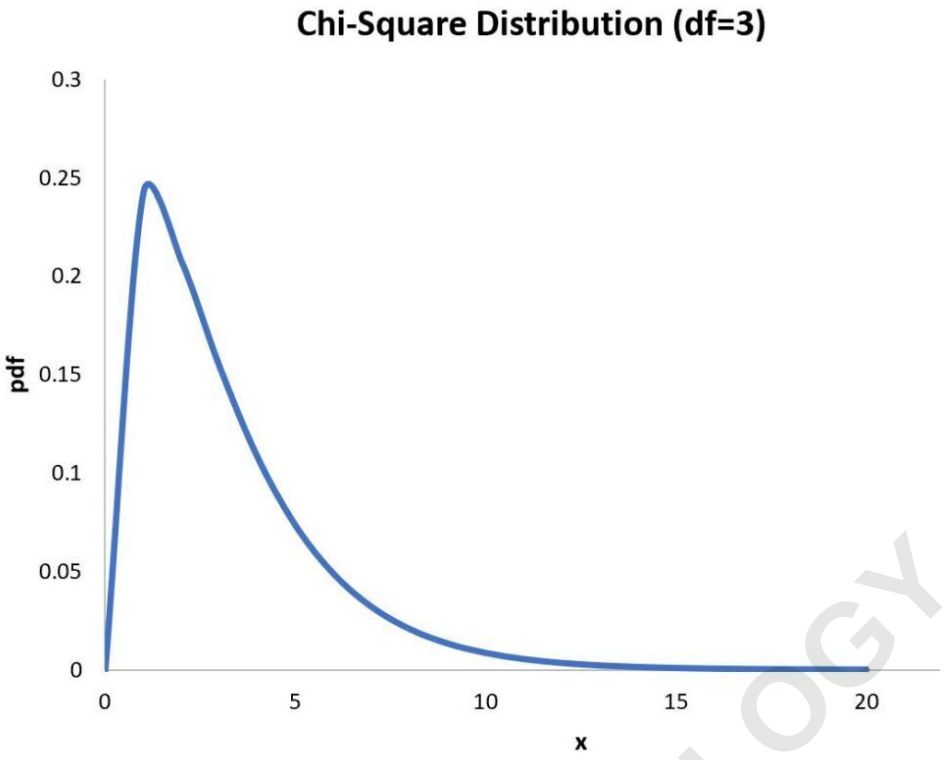


	A	B	C	D	E	F	G	H	I	J
1	x	y		df	7					
2	0	0								
3	1	0.016131								
4	2	0.055348								
5	3	0.092508								
6	4	0.115181								
7	5	0.122042								
8	6	0.116765								
9	7	0.10412								
10	8	0.088179								
11	9	0.071796								
12	10	0.056669								
13	11	0.04362								
14	12	0.032886								
15	13	0.024365								
16	14	0.017786								
17	15	0.012819								
18	16	0.009136								
19	17	0.006448								
20	18	0.004512								
21	19	0.003133								
22	20	0.00216								
23										
24										
25										
26										

Notice that the shape of the plot automatically changes to reflect a Chi-Square distribution with 7 degrees of freedom.

Step 4: Modify the Appearance of the Plot

Feel free to add a title, axis labels, and remove the gridlines to make the plot more aesthetically pleasing:



Additional Resources

The following tutorials explain how to plot other common distributions in Excel: