How to Find the Chi-Square Critical Value in Excel

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The Chi-Square critical value in Excel is a statistical measure used to determine the significance of relationships between categorical variables. It is calculated by using the CHISQ.INV function, which takes the desired probability level and the degrees of freedom as inputs. The resulting value is compared to the Chi-Square statistic obtained from the data, and if it is greater, it indicates a significant relationship between the variables. This formula allows for quick and accurate determination of the Chi-Square critical value, making it a useful tool for analyzing categorical data in Excel.

Find the Chi-Square Critical Value in Excel

When you conduct a Chi-Square test, you will get a test statistic as a result. To determine if the results of the Chi-Square test are statistically significant, you can compare the test statistic to a Chi-Square critical value. If the test statistic is greater than the Chi-Square critical value, then the results of the test are statistically significant.

The Chi-Square critical value can be found by using a or by using statistical software.

To find the Chi-Square critical value, you need:

A significance level (common choices are 0.01, 0.05, and 0.10)Degrees of freedom

Using these two values, you can determine the Chi-Square value to be compared with the test statistic.

How to Find the Chi-Square Critical Value in Excel

To find the Chi-Square critical value in Excel, you can use the CHISQ.INV.RT() function, which uses the following syntax:

CHISQ.INV.RT(probability, deg_freedom)

probability: The significance level to usedeg_freedom: The degrees of freedom

This function returns the critical value from the Chi-Square distribution based on the significance level and the degrees of freedom provided.

For example, suppose we would like to find the Chi-square critical value for a significance level of 0.05 and degrees of freedom = 11.

In Excel, we can type the following formula: CHISQ.INV.RT(0.05, 11)

	A	B	C	D
1	**Formula**			
2	=CHISQ.INV.RT(0.05, 11)			
3				
4	**Answer**			
5	19.67514			
6				
7				

This returns the value 19.67514. This is the critical value for a significance level of 0.05 and degrees of freedom = 11.

Note that this also matches the number we would find in the with α = 0.05, DF *(degrees of freedom)* = 11.

	P										
DF	0.995	0.975	0.2	0.1	0.05	0.025	0.02	0.01	0.005	0.002	0.001
1	.0004	.00016	1.642	2.706	3.841	5.024	5.412	6.635	7.879	9.55	10.828
2	0.01	0.0506	3.219	4.605	5.991	7.378	7.824	9.21	10.597	12.429	13.816
3	0.0717	0.216	4.642	6.251	7.815	9.348	9.837	11.345	12.838	14.796	16.266
4	0.207	0.484	5.989	7.779	9.488	11.143	11.668	13.277	14.86	16.924	18.467
5	0.412	0.831	7.289	9.236	11.07	12.833	13.388	15.086	16.75	18.907	20.515
6	0.676	1.237	8.558	10.645	12.592	14.449	15.033	16.812	18.548	20.791	22.458
7	0.989	1.69	9.803	12.017	14.067	16.013	16.622	18.475	20.278	22.601	24.322
8	1.344	2.18	11.03	13.362	15.507	17.535	18.168	20.09	21.955	24.352	26.124
9	1.735	2.7	12.242	14.684	16.919	19.023	19.679	21.666	23.589	26.056	27.877
10	2.156	3.247	13.442	15.987	18.307	20.483	21.161	23.209	25.188	27.722	29.588
11	2.603	3.816	14.631	17.275	19.675	21.92	22.618	24.725	26.757	29.354	31.264
12	3.074	4.404	15.812	18.549	21.026	23.337	24.054	26.217	28.3	30.957	32.909
13	3.565	5.009	16.985	19.812	22.362	24.736	25.472	27.688	29.819	32.535	34.528
14	4.075	5.629	18.151	21.064	23.685	26.119	26.873	29.141	31.319	34.091	36.123
15	4.601	6.262	19.311	22.307	24.996	27.488	28.259	30.578	32.801	35.628	37.697
16	5.142	6.908	20.465	23.542	26.296	28.845	29.633	32	34.267	37.146	39.252
17	5.697	7.564	21.615	24.769	27.587	30.191	30.995	33.409	35.718	38.648	40.79

Cautions on Finding the Chi-Square Critical Value in Excel

If any argument is non-numeric.If the value for *probability* is less than zero or greater than 1.If the value for *deg_freedom* is less than 1.