

χ^2 Distribution table

Description: This table provides the quantiles (percentiles) corresponding to the given probabilities (areas) listed at the top.

To get quantiles (percentiles):

1. Use the correct row at the top of the table based on whether you are doing a:
 - (1) one sided (directional) test, or
 - (2) two sided (non-directional) test.
2. Use your value of α and go down the column until you get to the row for your degrees of freedom.

For example, you want to find the quantile corresponding to $\alpha = 0.05$ using $d.f. = 3$. You are doing a two sided (non-directional) test.

Use the second row at the top of the table (the one labeled two sided probabilities). Go across until you see 0.05. then go down until you intersect the row labeled 7. You should see **7.815**.

To get approximate p -values (to bracket p -values):

1. Find the correct row for the degrees of freedom you are using.
2. Go across until you find the two numbers that bracket your number (χ^{2*}).
3. Now go to the top and read off the two probabilities that correspond with the columns of the two numbers that bracket your number.

Your p -value is between these two probabilities.

Note: If your number is larger or smaller than the biggest or smallest number in your row, you can't bracket your p -value. You can only do $p <$ or $p >$ the probability at the top of the table.

For example, you calculate $\chi^{2*} = 8.34$ with $d.f. = 2$ and you want to bracket your p -value. You are doing a two sided test (this is obvious since $d.f. > 1$).

Go into the row for $d.f. = 2$ and move across.

You find that 8.34 is between 7.824 and 9.210.

Move to the top of the table and consult the row for *Two sided probabilities*. You find 0.02 and 0.01. So you can write:

$$0.01 < p < 0.02.$$

In other words, your p -value is between 0.05 and 0.10.

Table 5. χ^2 -distribution table.

One sided probabilities (Only possible if <i>d.f.</i> = 1)	0.1	0.05	0.025	0.01	0.005	0.0025	0.0005	0.00025	0.00005
Two sided probabilities	0.2	0.1	0.05	0.02	0.01	0.005	0.001	0.0005	0.0001
df									
1	1.642	2.706	3.841	5.412	6.635	7.879	10.828	12.116	15.137
2	3.219	4.605	5.991	7.824	9.210	10.597	13.816	15.202	18.421
3	4.642	6.251	7.815	9.837	11.345	12.838	16.266	17.730	21.108
4	5.989	7.779	9.488	11.668	13.277	14.860	18.467	19.997	23.513
5	7.289	9.236	11.070	13.388	15.086	16.750	20.515	22.105	25.745
6	8.558	10.645	12.592	15.033	16.812	18.548	22.458	24.103	27.856
7	9.803	12.017	14.067	16.622	18.475	20.278	24.322	26.018	29.878
8	11.030	13.362	15.507	18.168	20.090	21.955	26.124	27.868	31.828
9	12.242	14.684	16.919	19.679	21.666	23.589	27.877	29.666	33.720
10	13.442	15.987	18.307	21.161	23.209	25.188	29.588	31.420	35.564
11	14.631	17.275	19.675	22.618	24.725	26.757	31.264	33.137	37.367
12	15.812	18.549	21.026	24.054	26.217	28.300	32.909	34.821	39.134
13	16.985	19.812	22.362	25.472	27.688	29.819	34.528	36.478	40.871
14	18.151	21.064	23.685	26.873	29.141	31.319	36.123	38.109	42.579
15	19.311	22.307	24.996	28.259	30.578	32.801	37.697	39.719	44.263
16	20.465	23.542	26.296	29.633	32.000	34.267	39.252	41.308	45.925
17	21.615	24.769	27.587	30.995	33.409	35.718	40.790	42.879	47.566
18	22.760	25.989	28.869	32.346	34.805	37.156	42.312	44.434	49.189
19	23.900	27.204	30.144	33.687	36.191	38.582	43.820	45.973	50.795
20	25.038	28.412	31.410	35.020	37.566	39.997	45.315	47.498	52.386
21	26.171	29.615	32.671	36.343	38.932	41.401	46.797	49.011	53.962
22	27.301	30.813	33.924	37.659	40.289	42.796	48.268	50.511	55.525
23	28.429	32.007	35.172	38.968	41.638	44.181	49.728	52.000	57.075
24	29.553	33.196	36.415	40.270	42.980	45.559	51.179	53.479	58.613
25	30.675	34.382	37.652	41.566	44.314	46.928	52.620	54.947	60.140
26	31.795	35.563	38.885	42.856	45.642	48.290	54.052	56.407	61.657
27	32.912	36.741	40.113	44.140	46.963	49.645	55.476	57.858	63.164
28	34.027	37.916	41.337	45.419	48.278	50.993	56.892	59.300	64.662
29	35.139	39.087	42.557	46.693	49.588	52.336	58.301	60.735	66.152
30	36.250	40.256	43.773	47.962	50.892	53.672	59.703	62.162	67.633
31	37.359	41.422	44.985	49.226	52.191	55.003	61.098	63.582	69.106
32	38.466	42.585	46.194	50.487	53.486	56.328	62.487	64.995	70.571
33	39.572	43.745	47.400	51.743	54.776	57.648	63.870	66.403	72.030
34	40.676	44.903	48.602	52.995	56.061	58.964	65.247	67.803	73.481
35	41.778	46.059	49.802	54.244	57.342	60.275	66.619	69.199	74.926
40	47.269	51.805	55.758	60.436	63.691	66.766	73.402	76.095	82.062
45	52.729	57.505	61.656	66.555	69.957	73.166	80.077	82.876	89.070
50	58.164	63.167	67.505	72.613	76.154	79.490	86.661	89.561	95.969