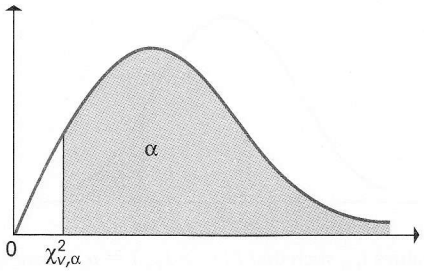
Table 7b Lower Critical Values of Chi-Square Distribution with ν Degrees of Freedom



For selected probabilities α, the table shows the values $\chi^2_{\nu,\alpha}$ such that $P(\chi^2_\nu > \chi^2_{\nu,\alpha}) = \alpha$, where χ^2_ν is a chi-square random variable with ν degress of freedom. For example, the probability is 0.90 that a chi-square variable with 10 degrees of freedom is greater than 4.865.

	Probability of Exceeding the Critical Value				
ν	0.90	0.95	0.975	0.99	0.999
1	.016	.004	.001	.000	.000
2	.211	.103	.051	.020	.002
3	.584	.352	.216	.115	.024
4	1.064	.711	.484	.297	.091
5	1.610	1.145	.831	.554	.210
6	2.204	1.635	1.237	.872	.381
7	2.833	2.167	1.690	1.239	.598
8	3.490	2.733	2.180	1.646	.857
9	4.168	3.325	2.700	2.088	1.152
10	4.865	3.940	3.247	2.558	1.479
11	5.578	4.575	3.816	3.053	1.834
12	6.304	5.226	4.404	3.571	2.214
13	7.042	5.892	5.009	4.107	2.617
14	7.790	6.571	5.629	4.660	3.041
15	8.547	7.261	6.262	5.229	3.483
16	9.312	7.962	6.908	5.812	3.942
17	10.085	8.672	7.564	6.408	4.416
18	10.865	9.390	8.231	7.015	4.905
19	11.651	10.117	8.907	7.633	5.407
20	12.443	10.851	9.591	8.260	5.921
21	13.240	11.591	10.283	8.897	6.447
22	14.041	12.338	10.982	9.542	6.983
23	14.848	13.091	11.689	10.196	7.529
24	15.659	13.848	12.401	10.856	8.085
25	16.473	14.611	13.120	11.524	8.649
26	17.292	15.379	13.844	12.198	9.222
27	18.114	16.151	14.573	12.879	9.803
28	18.939	16.928	15.308	13.565	10.391
29	19.768	17.708	16.047	14.256	10.986
30	20.599	18.493	16.791	14.953	11.588
40	29.051	26.509	24.433	22.164	17.916
50	37.689	34.764	32.357	29.707	24.674
60	46.459	43.188	40.482	37.485	31.738
70	55.329	51.739	48.758	45.442	39.036
80	64.278	60.391	57.153	53.540	46.520
90	73.291	69.126	65.647	61.754	54.155
100	82.358	77.929	74.222	70.065	61.918

NIST/SEMATECH e-Handbook of Statistical Methods, http://www.itl.nist.gov/div898/handbook/, September 2011.