

## Distribución $\chi^2$ con $n$ grados de libertad $\chi_n^2$ .

Las siguientes tablas nos dan algunos valores de la función de distribución de probabilidad  $\chi^2$ . En concreto  $P(\chi_n^2 \leq \chi_{n,\alpha}^2) = \alpha$ , donde  $n$  es el número de grados de libertad y  $\alpha$  la probabilidad. Por ejemplo  $P(\chi_1^2 \leq 7.88) = 0.995$ , o lo que es lo mismo  $\chi_{1,0.995}^2 = 7.88$ .

$n \backslash \alpha$	0.995	0.99	0.975	0.95	0.9	0.85	0.8	0.75	0.7	0.65	0.6	0.55	0.5	0.45	0.4	0.35	0.3	0.25	0.2	0.15	0.1	0.05	0.025	0.01	0.005
1	7.879	6.635	5.024	3.841	2.706	2.072	1.642	1.323	1.074	0.873	0.708	0.571	0.455	0.357	0.275	0.206	0.148	0.102	0.064	0.036	0.016	0.004	0.001	0	0
2	10.597	9.21	7.378	5.991	4.605	3.794	3.219	2.773	2.408	2.1	1.833	1.597	1.386	1.196	1.022	0.862	0.713	0.575	0.446	0.325	0.211	0.103	0.051	0.02	0.01
3	12.838	11.345	9.348	7.815	6.251	5.317	4.642	4.108	3.665	3.283	2.946	2.643	2.366	2.109	1.869	1.642	1.424	1.213	1.005	0.798	0.584	0.352	0.216	0.115	0.072
4	14.86	13.277	11.143	9.488	7.779	6.745	5.989	5.385	4.878	4.438	4.045	3.687	3.357	3.047	2.753	2.47	2.195	1.923	1.649	1.366	1.064	0.711	0.484	0.297	0.207
5	16.75	15.086	12.833	11.07	9.236	8.115	7.289	6.626	6.064	5.573	5.132	4.728	4.351	3.996	3.655	3.325	3	2.675	2.343	1.994	1.61	1.145	0.831	0.554	0.412
6	18.548	16.812	14.449	12.592	10.645	9.446	8.558	7.841	7.231	6.695	6.211	5.765	5.348	4.952	4.57	4.197	3.828	3.455	3.07	2.661	2.204	1.635	1.237	0.872	0.676
7	20.278	18.475	16.013	14.067	12.017	10.748	9.803	9.037	8.383	7.806	7.283	6.8	6.346	5.913	5.493	5.082	4.671	4.255	3.822	3.358	2.833	2.167	1.69	1.239	0.989
8	21.955	20.09	17.535	15.507	13.362	12.027	11.03	10.219	9.524	8.909	8.351	7.833	7.344	6.877	6.423	5.975	5.527	5.071	4.594	4.078	3.49	2.733	2.18	1.646	1.344
9	23.589	21.666	19.023	16.919	14.684	13.288	12.242	11.389	10.656	10.006	9.414	8.863	8.343	7.843	7.357	6.876	6.393	5.899	5.38	4.817	4.168	3.325	2.7	2.088	1.735
10	25.188	23.209	20.483	18.307	15.987	14.534	13.442	12.549	11.781	11.097	10.473	9.892	9.342	8.812	8.295	7.783	7.267	6.737	6.179	5.57	4.865	3.94	3.247	2.558	2.156
11	26.757	24.725	21.92	19.675	17.275	15.767	14.631	13.701	12.899	12.184	11.53	10.92	10.341	9.783	9.237	8.695	8.148	7.584	6.989	6.336	5.578	4.575	3.816	3.053	2.603
12	28.3	26.217	23.337	21.026	18.549	16.989	15.812	14.845	14.011	13.266	12.584	11.946	11.34	10.755	10.182	9.612	9.034	8.438	7.807	7.114	6.304	5.226	4.404	3.571	3.074
13	29.819	27.688	24.736	22.362	19.812	18.202	16.985	15.984	15.119	14.345	13.636	12.972	12.34	11.729	11.129	10.532	9.926	9.299	8.634	7.901	7.042	5.892	5.009	4.107	3.565
14	31.319	29.141	26.119	23.685	21.064	19.406	18.151	17.117	16.222	15.421	14.685	13.996	13.339	12.703	12.078	11.455	10.821	10.165	9.467	8.696	7.79	6.571	5.629	4.66	4.075
15	32.801	30.578	27.488	24.996	22.307	20.603	19.311	18.245	17.322	16.494	15.733	15.02	14.339	13.679	13.03	12.381	11.721	11.037	10.307	9.499	8.547	7.261	6.262	5.229	4.601
16	34.267	32	28.845	26.296	23.542	21.793	20.465	19.369	18.418	17.565	16.78	16.042	15.338	14.655	13.983	13.31	12.624	11.912	11.152	10.309	9.312	7.962	6.908	5.812	5.142
17	35.718	33.409	30.191	27.587	24.769	22.977	21.615	20.489	19.511	18.633	17.824	17.065	16.338	15.633	14.937	14.241	13.531	12.792	12.002	11.125	10.085	8.672	7.564	6.408	5.697
18	37.156	34.805	31.526	28.869	25.989	24.155	22.76	21.605	20.601	19.699	18.868	18.086	17.338	16.611	15.893	15.174	14.44	13.675	12.857	11.946	10.865	9.39	8.231	7.015	6.265
19	38.582	36.191	32.852	30.144	27.204	25.329	23.9	22.718	21.689	20.764	19.91	19.107	18.338	17.589	16.85	16.109	15.352	14.562	13.716	12.773	11.651	10.117	8.907	7.633	6.844
20	39.997	37.566	34.17	31.41	28.412	26.498	25.038	23.828	22.775	21.826	20.951	20.127	19.337	18.569	17.809	17.046	16.266	15.452	14.578	13.604	12.443	10.851	9.591	8.26	7.434
21	41.401	38.932	35.479	32.671	29.615	27.662	26.171	24.935	23.858	22.888	21.991	21.147	20.337	19.548	18.768	17.984	17.182	16.344	15.445	14.439	13.24	11.591	10.283	8.897	8.034
22	42.796	40.289	36.781	33.924	30.813	28.822	27.301	26.039	24.939	23.947	23.031	22.166	21.337	20.529	19.729	18.924	18.101	17.24	16.314	15.279	14.041	12.338	10.982	9.542	8.643
23	44.181	41.638	38.076	35.172	32.007	29.979	28.429	27.141	26.018	25.006	24.069	23.185	22.337	21.51	20.69	19.866	19.021	18.137	17.187	16.122	14.848	13.091	11.689	10.196	9.26
24	45.559	42.98	39.364	36.415	33.196	31.132	29.553	28.241	27.096	26.063	25.106	24.204	23.337	22.491	21.652	20.808	19.943	19.037	18.062	16.969	15.659	13.848	12.401	10.856	9.886
25	46.928	44.314	40.646	37.652	34.382	32.282	30.675	29.339	28.172	27.118	26.143	25.222	24.337	23.472	22.616	21.752	20.867	19.939	18.94	17.818	16.473	14.611	13.12	11.524	10.52
26	48.29	45.642	41.923	38.885	35.563	33.429	31.795	30.435	29.246	28.173	27.179	26.24	25.336	24.454	23.579	22.697	21.792	20.843	19.82	18.671	17.292	15.379	13.844	12.198	11.16
27	49.645	46.963	43.195	40.113	36.741	34.574	32.912	31.528	30.319	29.227	28.214	27.257	26.336	25.437	24.544	23.644	22.719	21.749	20.703	19.527	18.114	16.151	14.573	12.879	11.808
28	50.993	48.278	44.461	41.337	37.916	35.715	34.027	32.62	31.391	30.279	29.249	28.274	27.336	26.419	25.509	24.591	23.647	22.657	21.588	20.386	18.939	16.928	15.308	13.565	12.461
29	52.336	49.588	45.722	42.557	39.087	36.854	35.139	33.711	32.461	31.331	30.283	29.291	28.336	27.402	26.475	25.539	24.577	23.567	22.475	21.247	19.768	17.708	16.047	14.256	13.121
30	53.672	50.892	46.979	43.773	40.256	37.99	36.25	34.8	33.53	32.382	31.316	30.307	29.336	28.386	27.442	26.488	25.508	24.478	23.364	22.11	20.599	18.493	16.791	14.953	13.787
31	55.003	52.191	48.232	44.985	41.422	39.124	37.359	35.887	34.598	33.431	32.349	31.323	30.336	29.369	28.409	27.438	26.44	25.39	24.255	22.976	21.434	19.281	17.539	15.655	14.458
32	56.328	53.486	49.48	46.194	42.585	40.256	38.466	36.973	35.665	34.48	33.381	32.339	31.336	30.353	29.376	28.389	27.373	26.304	25.148	23.844	22.271	20.072	18.291	16.362	15.134
33	57.648	54.776	50.725	47.4	43.745	41.386	39.572	38.058	36.731	35.529	34.413	33.355	32.336	31.337	30.344	29.34	28.307	27.219	26.042	24.714	23.11	20.867	19.047	17.074	15.815
34	58.964	56.061	51.966	48.602	44.903	42.514	40.676	39.141	37.795	36.576	35.444	34.371	33.336	32.322	31.313	30.293	29.242	28.136	26.938	25.586	23.952	21.664	19.806	17.789	16.501
35	60.275	57.342	53.203	49.802	46.059	43.64	41.778	40.223	38.859	37.623	36.475	35.386	34.336	33.306	32.282	31.246	30.178	29.054	27.836	26.46	24.797	22.465	20.569	18.509	17.192
36	61.581	58.619	54.437	50.998	47.212	44.764	42.879	41.304	39.922	38.669	37.505	36.401	35.336	34.291	33.252	32.2	31.115	29.973	28.735	27.336	25.643	23.269	21.336	19.233	17.887
37	62.883	59.893	55.668	52.192	48.363	45.886	43.978	42.383	40.984	39.715	38.535	37.416	36.336	35.276	34.222	33.154	32.053	30.893	29.635	28.214	26.492	24.075	22.106	19.96	18.586
38	64.181	61.162	56.896	53.384	49.513	47.007	45.076	43.462	42.045	40.76	39.564	38.43	37.335	36.262	35.192	34.109	32.992	31.815	30.537	29.093	27.343	24.884	22.878	20.691	19.289
39	65.476	62.428	58.12	54.572	50.66	48.126	46.173	44.539	43.105	41.804	40.593	39.445	38.335	37.247	36.163	35.064	33.932	32.737	31.441	29.974	28.196	25.695	23.654	21.426	19.996
40	66.766	63.691	59.342	55.758	51.805	49.244	47.269	45.616	44.165	42.848	41.622	40.459	39.335	38.233	37.134	36.021	34.872	33.66	32.345	30.856	29.051	26.509	24.433	22.164	20.707
41	68.053	64.95	60.561	56.942	52.949	50.36	48.363	46.692	45.224	43.891	42.651	41.473	40.335	39.219	38.105	36.977	35.813	34.585	33.251	31.74	29.907	27.326	25.215	22.906	21.421
42	69.336	66.206	61.777	58.124	54.09	51.475	49.456	47.766	46.282	44.934	43.679	42.487	41.335	40.205	39.077	37.935	36.755	35.51	34.157	32.626	30.765	28.144	25.999	23.65	22.138
43	70.616	67.459	62.99	59.304	55.23	52.588	50.548	48.84	47.339	45.976	44.706	43.501	42.335	41.191	40.05	38.892	37.698	36.436</							

Continuación distribución  $\chi^2$ .

$n \backslash \alpha$	0.995	0.99	0.975	0.95	0.9	0.85	0.8	0.75	0.7	0.65	0.6	0.55	0.5	0.45	0.4	0.35	0.3	0.25	0.2	0.15	0.1	0.05	0.025	0.01	0.005
46	74.437	71.201	66.617	62.83	58.641	55.92	53.818	52.056	50.507	49.099	47.787	46.541	45.335	44.15	42.968	41.769	40.529	39.22	37.795	36.18	34.215	31.439	29.16	26.657	25.041
47	75.704	72.443	67.821	64.001	59.774	57.028	54.906	53.127	51.562	50.139	48.814	47.554	46.335	45.137	43.942	42.728	41.474	40.149	38.708	37.072	35.081	32.268	29.956	27.416	25.775
48	76.969	73.683	69.023	65.171	60.907	58.135	55.993	54.196	52.616	51.179	49.84	48.567	47.335	46.124	44.915	43.689	42.42	41.079	39.621	37.965	35.949	33.098	30.755	28.177	26.511
49	78.231	74.919	70.222	66.339	62.038	59.241	57.079	55.265	53.67	52.219	50.866	49.58	48.335	47.111	45.889	44.649	43.366	42.01	40.534	38.859	36.818	33.93	31.555	28.941	27.249
50	79.49	76.154	71.42	67.505	63.167	60.346	58.164	56.334	54.723	53.258	51.892	50.592	49.335	48.099	46.864	45.61	44.313	42.942	41.449	39.754	37.689	34.764	32.357	29.707	27.991
51	80.747	77.386	72.616	68.669	64.295	61.45	59.248	57.401	55.775	54.296	52.917	51.605	50.335	49.086	47.838	46.571	45.261	43.874	42.365	40.65	38.56	35.6	33.162	30.475	28.735
52	82.001	78.616	73.81	69.832	65.422	62.553	60.332	58.468	56.827	55.334	53.942	52.617	51.335	50.073	48.813	47.533	46.209	44.808	43.281	41.547	39.433	36.437	33.968	31.246	29.481
53	83.253	79.843	75.002	70.993	66.548	63.654	61.414	59.534	57.879	56.372	54.967	53.63	52.335	51.061	49.788	48.495	47.157	45.741	44.199	42.446	40.308	37.276	34.776	32.018	30.23
54	84.502	81.069	76.192	72.153	67.673	64.755	62.496	60.6	58.93	57.41	55.992	54.642	53.335	52.049	50.764	49.458	48.106	46.676	45.117	43.345	41.183	38.116	35.586	32.793	30.981
55	85.749	82.292	77.38	73.311	68.796	65.855	63.577	61.665	59.98	58.447	57.016	55.654	54.335	53.037	51.739	50.42	49.055	47.61	46.036	44.245	42.06	38.958	36.398	33.57	31.735
56	86.994	83.513	78.567	74.468	69.919	66.954	64.658	62.729	61.031	59.484	58.04	56.666	55.335	54.025	52.715	51.384	50.005	48.546	46.955	45.146	42.937	39.801	37.212	34.35	32.49
57	88.236	84.733	79.752	75.624	71.04	68.052	65.737	63.793	62.08	60.52	59.064	57.678	56.335	55.013	53.691	52.347	50.956	49.482	47.876	46.048	43.816	40.646	38.027	35.131	33.248
58	89.477	85.95	80.936	76.778	72.16	69.149	66.816	64.857	63.129	61.556	60.088	58.69	57.335	56.001	54.667	53.311	51.906	50.419	48.797	46.951	44.696	41.492	38.844	35.913	34.008
59	90.715	87.166	82.117	77.931	73.279	70.246	67.894	65.919	64.178	62.592	61.111	59.701	58.335	56.989	55.643	54.275	52.858	51.356	49.718	47.854	45.577	42.339	39.662	36.698	34.77
60	91.952	88.379	83.298	79.082	74.397	71.341	68.972	66.981	65.227	63.628	62.135	60.713	59.335	57.978	56.62	55.239	53.809	52.294	50.641	48.759	46.459	43.188	40.482	37.485	35.534
61	93.186	89.591	84.476	80.232	75.514	72.436	70.049	68.043	66.274	64.663	63.158	61.724	60.335	58.966	57.597	56.204	54.761	53.232	51.564	49.664	47.342	44.038	41.303	38.273	36.301
62	94.419	90.802	85.654	81.381	76.63	73.53	71.125	69.104	67.322	65.698	64.181	62.736	61.335	59.955	58.574	57.169	55.714	54.171	52.487	50.57	48.226	44.898	42.126	39.063	37.068
63	95.649	92.01	86.83	82.529	77.745	74.623	72.201	70.165	68.369	66.733	65.204	63.747	62.335	60.943	59.551	58.134	56.666	55.11	53.412	51.477	49.111	45.741	42.95	39.855	37.838
64	96.878	93.217	88.004	83.675	78.86	75.715	73.276	71.225	69.416	67.767	66.226	64.758	63.335	61.932	60.528	59.1	57.62	56.05	54.336	52.384	49.996	46.595	43.776	40.649	38.61
65	98.105	94.422	89.177	84.821	79.973	76.807	74.351	72.285	70.462	68.801	67.249	65.769	64.335	62.921	61.506	60.066	58.573	56.99	55.262	53.293	50.883	47.45	44.603	41.444	39.383
66	99.33	95.626	90.349	85.965	81.085	77.898	75.424	73.344	71.508	69.835	68.271	66.78	65.335	63.91	62.484	61.032	59.527	57.931	56.188	54.202	51.77	48.305	45.431	42.24	40.158
67	100.554	96.828	91.519	87.108	82.197	78.988	76.498	74.403	72.554	70.868	69.293	67.791	66.335	64.899	63.461	61.998	60.481	58.872	57.115	55.111	52.659	49.162	46.261	43.038	40.935
68	101.776	98.028	92.689	88.25	83.308	80.078	77.571	75.461	73.6	71.902	70.315	68.802	67.335	65.888	64.44	62.965	61.436	59.814	58.042	56.022	53.548	50.02	47.092	43.838	41.713
69	102.996	99.228	93.856	89.391	84.418	81.167	78.643	76.519	74.645	72.935	71.337	69.813	68.334	66.877	65.418	63.932	62.391	60.756	58.97	56.933	54.438	50.879	47.924	44.639	42.494
70	104.215	100.425	95.023	90.531	85.527	82.255	79.715	77.577	75.689	73.968	72.358	70.824	69.334	67.866	66.396	64.899	63.346	61.698	59.898	57.844	55.329	51.739	48.758	45.442	43.275
71	105.432	101.621	96.189	91.67	86.635	83.343	80.786	78.634	76.734	75	73.38	71.834	70.334	68.856	67.375	65.866	64.302	62.641	60.827	58.757	56.221	52.6	49.592	46.246	44.058
72	106.648	102.816	97.353	92.808	87.743	84.43	81.857	79.69	77.778	76.033	74.401	72.845	71.334	69.845	68.353	66.834	65.258	63.585	61.756	59.67	57.113	53.462	50.428	47.051	44.843
73	107.862	104.01	98.516	93.945	88.85	85.517	82.927	80.747	78.821	77.065	75.422	73.855	72.334	70.835	69.332	67.802	66.214	64.528	62.686	60.583	58.006	54.325	51.265	47.858	45.629
74	109.074	105.202	99.678	95.081	89.956	86.602	83.997	81.803	79.665	78.097	76.443	74.866	73.334	71.824	70.311	68.77	67.17	65.472	63.616	61.497	58.9	55.189	52.103	48.666	46.417
75	110.286	106.393	100.839	96.217	91.061	87.688	85.066	82.858	80.908	79.129	77.464	75.876	74.334	72.814	71.29	69.738	68.127	66.417	64.547	62.412	59.795	56.054	52.942	49.475	47.206
76	111.495	107.583	101.999	97.351	92.166	88.772	86.135	83.913	81.951	80.16	78.485	76.886	75.334	73.804	72.27	70.707	69.084	67.362	65.478	63.327	60.69	56.92	53.782	50.286	47.997
77	112.704	108.771	103.158	98.484	93.27	89.857	87.203	84.968	82.994	81.191	79.505	77.896	76.334	74.793	73.249	71.675	70.042	68.307	66.409	64.243	61.586	57.786	54.623	51.097	48.788
78	113.911	109.958	104.316	99.617	94.374	90.94	88.271	86.022	84.036	82.222	80.526	78.907	77.334	75.783	74.228	72.644	70.999	69.252	67.341	65.159	62.483	58.654	55.466	51.91	49.582
79	115.117	111.144	105.473	100.749	95.476	92.023	89.338	87.077	85.078	83.253	81.546	79.917	78.334	76.773	75.208	73.613	71.957	70.198	68.274	66.076	63.38	59.522	56.309	52.725	50.376
80	116.321	112.329	106.629	101.879	96.578	93.106	90.405	88.13	86.12	84.284	82.566	80.927	79.334	77.763	76.188	74.583	72.915	71.145	69.207	66.994	64.278	60.391	57.153	53.54	51.172
81	117.524	113.512	107.783	103.01	97.68	94.188	91.472	89.184	87.161	85.314	83.586	81.937	80.334	78.753	77.168	75.552	73.874	72.091	70.14	67.912	65.176	61.261	57.998	54.357	51.969
82	118.726	114.695	108.937	104.139	98.78	95.269	92.538	90.237	88.202	86.345	84.606	82.946	81.334	79.743	78.148	76.522	74.833	73.038	71.074	68.83	66.076	62.132	58.845	55.174	52.767
83	119.927	115.876	110.09	105.267	99.88	96.35	93.604	91.289	89.243	87.375	85.626	83.956	82.334	80.733	79.128	77.491	75.792	73.985	72.008	69.749	66.976	63.004	59.692	55.993	53.567
84	121.126	117.057	111.242	106.395	100.98	97.431	94.669	92.342	90.284	88.405	86.646	84.966	83.334	81.724	80.108	78.462	76.751	74.933	72.943	70.669	67.876	63.876	60.54	56.813	54.368
85	122.325	118.236	112.393	107.522	102.079	98.511	95.734	93.394	91.325	89.435	87.665	85.976	84.334	82.714	81.089	79.432	77.71	75.881	73.878	71.589	68.777	64.749	61.389	57.634	55.17
86	123.522	119.414	113.544	108.648	103.177	99.59	96.799	94.446	92.365	90.464	88.685	86.985	85.334	83.704	82.069	80.402	78.67	76.829	74.813	72.509	69.679	65.623	62.239	58.456	55.973
87	124.718	120.591	114.693	109.773	104.275	100.669	97.863	95.497	93.405	91.494	89.704	87.995	86.334	84.695	83.05	81.373	79.63	77.777	75.749	73.43	70.581	66.498	63.089	59.279	56.777
88	125.913	121.767	115.841	110.898	10																				