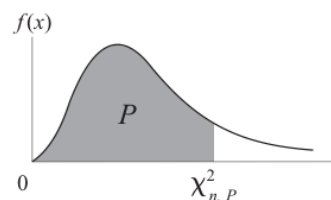


## TABLA DISTRIBUCIÓN JI CUADRADO

**TABLA A.6. Función de distribución  $\chi^2$  de Pearson**

Esta tabla proporciona los valores  $\chi_{n,p}^2$ , tales que

$$P = P(X \leq \chi_{n,p}^2) = \frac{1}{2^{n/2} \Gamma\left(\frac{n}{2}\right)} \int_0^{\chi_{n,p}^2} x^{\frac{n}{2}-1} \cdot e^{-\frac{1}{2}x} dx$$

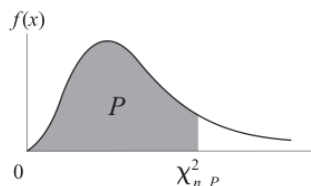


siendo  $X$  una variable aleatoria  $\chi^2$  de Pearson con  $n$ -grados de libertad.

$n \backslash P$	$P$						
	0,005	0,010	0,025	0,050	0,100	0,250	0,500
1	0,0000	0,0001	0,0009	0,0039	0,0157	0,1015	0,454
2	0,0100	0,0201	0,0506	0,1026	0,2107	0,5754	1,386
3	0,0717	0,1148	0,2158	0,3518	0,5844	1,213	2,366
4	0,2070	0,2971	0,4844	0,7107	1,064	1,923	3,357
5	0,4117	0,5543	0,8312	1,145	1,610	2,675	4,351
6	0,6757	0,8721	1,2373	1,635	2,204	3,455	5,348
7	0,9893	1,239	1,690	2,167	2,833	4,255	6,346
8	1,344	1,646	2,180	2,733	3,490	5,071	7,344
9	1,735	2,088	2,700	3,325	4,168	5,899	8,343
10	2,156	2,558	3,247	3,940	4,865	6,737	9,342
11	2,603	3,053	3,816	4,575	5,578	7,584	10,34
12	3,074	3,571	4,404	5,226	6,304	8,438	11,34
13	3,565	4,107	5,009	5,892	7,041	9,299	12,34
14	4,075	4,660	5,629	6,571	7,790	10,17	13,34
15	4,601	5,229	6,262	7,261	8,547	11,04	14,34
16	5,142	5,812	6,908	7,962	9,312	11,91	15,34
17	5,697	6,408	7,564	8,672	10,09	12,79	16,34
18	6,265	7,015	8,231	9,390	10,86	13,68	17,34
19	6,844	7,633	8,907	10,117	11,65	14,56	18,34
20	7,434	8,260	9,591	10,850	12,44	15,45	19,34
21	8,034	8,897	10,282	11,591	13,24	16,34	20,34
22	8,643	9,542	10,982	12,338	14,04	17,24	21,34
23	9,260	10,195	11,688	13,090	14,85	18,14	22,34
24	9,886	10,856	12,401	13,848	15,66	19,04	23,34
25	10,519	11,524	13,119	14,611	16,47	19,94	24,34
26	11,160	12,198	13,843	15,379	17,29	20,84	25,34
27	11,807	12,878	14,573	16,151	18,11	21,75	26,34
28	12,461	13,564	15,307	16,927	18,94	22,66	27,34
29	13,121	14,256	16,047	17,708	19,77	23,57	28,34
30	13,786	14,953	16,790	18,492	20,60	24,48	29,34
40	20,706	22,164	24,433	26,509	29,05	33,66	39,34
50	27,990	29,706	32,357	34,764	37,69	42,94	49,33
60	35,534	37,484	40,481	43,187	46,46	52,29	59,33
70	43,275	45,441	48,756	51,739	55,33	61,70	69,33
80	51,172	53,540	57,153	60,391	64,28	71,14	79,33
90	59,196	61,754	65,646	69,126	73,29	80,62	89,33
100	67,327	70,064	74,221	77,929	82,36	90,13	99,33

**TABLA A.6. Función de distribución  $\chi^2$  de Pearson (continuación)**

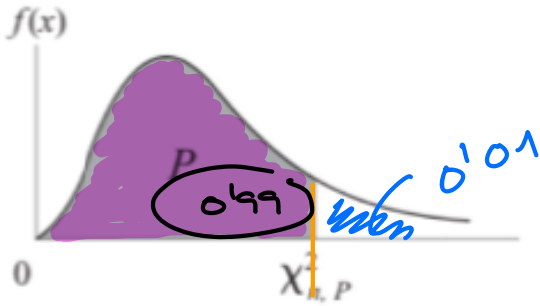
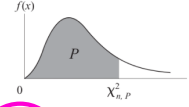
$$P = P(X \leq \chi_{n,p}^2) = \frac{1}{2^{n/2} \Gamma\left(\frac{n}{2}\right)} \int_0^{\chi_{n,p}^2} x^{\frac{n}{2}-1} \cdot e^{-\frac{1}{2}x} dx$$



<i>n</i>	<i>P</i>						
	0,750	0,900	0,950	0,975	0,990	0,995	0,999
1	1,32	2,70	3,84	5,02	6,63	7,88	10,83
2	2,77	4,60	5,99	7,38	9,21	10,60	13,82
3	4,11	6,25	7,81	9,35	11,34	12,84	16,27
4	5,38	7,78	9,49	11,14	13,28	14,86	18,47
5	6,63	9,24	11,07	12,83	15,09	16,75	20,52
6	7,84	10,64	12,59	14,45	16,81	18,55	22,46
7	9,04	12,02	14,07	16,01	18,48	20,28	24,32
8	10,22	13,36	15,51	17,53	20,09	21,96	26,12
9	11,39	14,68	16,92	19,02	21,67	23,59	27,88
10	12,55	15,99	18,31	20,48	23,21	25,19	29,59
11	13,70	17,28	19,68	21,92	24,72	26,76	31,26
12	14,85	18,55	21,03	23,34	26,22	28,30	32,91
13	15,98	19,81	22,36	24,74	27,69	29,82	34,53
14	17,12	21,06	23,68	26,12	29,14	31,32	36,12
15	18,25	22,31	25,00	27,49	30,58	32,80	37,70
16	19,37	23,54	26,30	28,85	32,00	34,27	39,25
17	20,49	24,77	27,59	30,19	33,41	35,72	40,79
18	21,60	25,99	28,87	31,53	34,81	37,16	42,31
19	22,72	27,20	30,14	32,85	36,19	38,58	43,82
20	23,83	28,41	31,41	34,17	37,57	40,00	45,32
21	24,93	29,62	32,67	35,48	38,93	41,40	46,80
22	26,04	30,81	33,92	36,78	40,29	42,80	48,27
23	27,14	32,01	35,17	38,08	41,64	44,18	49,73
24	28,24	33,20	36,42	39,36	42,98	45,56	51,18
25	29,34	34,38	37,65	40,65	44,31	46,93	52,62
26	30,43	35,56	38,89	41,92	45,64	48,29	54,05
27	31,53	36,74	40,11	43,19	46,96	49,64	55,48
28	32,62	37,92	41,34	44,46	48,28	50,99	56,89
29	33,71	39,09	42,56	45,72	49,59	52,34	58,30
30	34,80	40,26	43,77	46,98	50,89	53,67	59,70
40	45,62	51,80	55,76	59,34	63,69	66,77	73,40
50	56,33	63,17	67,50	71,42	76,15	79,49	86,66
60	66,98	74,40	79,08	83,30	88,38	91,95	99,61
70	77,58	85,53	90,53	95,02	100,42	104,21	112,29
80	88,13	96,58	101,87	106,62	112,32	116,32	124,77
90	98,65	107,56	113,14	118,13	124,11	128,29	137,20
100	109,09	118,49	124,34	129,56	135,80	140,16	149,38

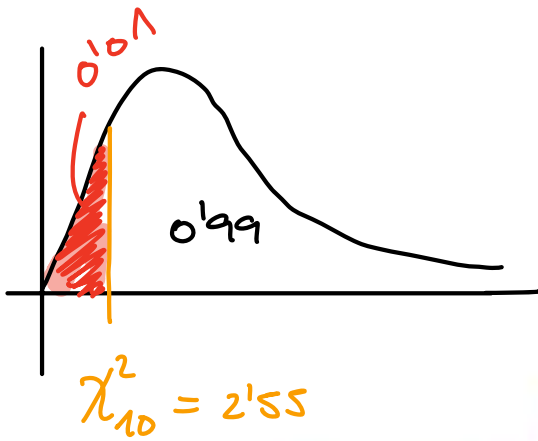
TABLA A.6. Función de distribución  $\chi^2$  de Pearson (continuación)

$$P = P(X \leq \chi_{\alpha, P}^2) = \frac{1}{2^{n/2} \Gamma(\frac{n}{2})} \int_0^{\chi_{\alpha, P}^2} x^{\frac{n}{2}-1} \cdot e^{-\frac{1}{2}x} dx$$



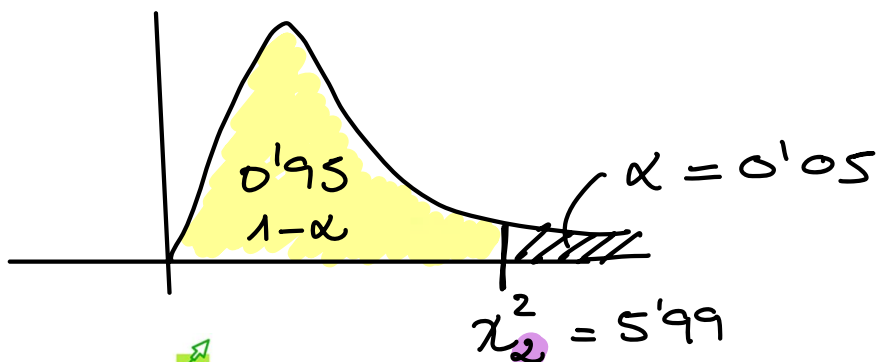
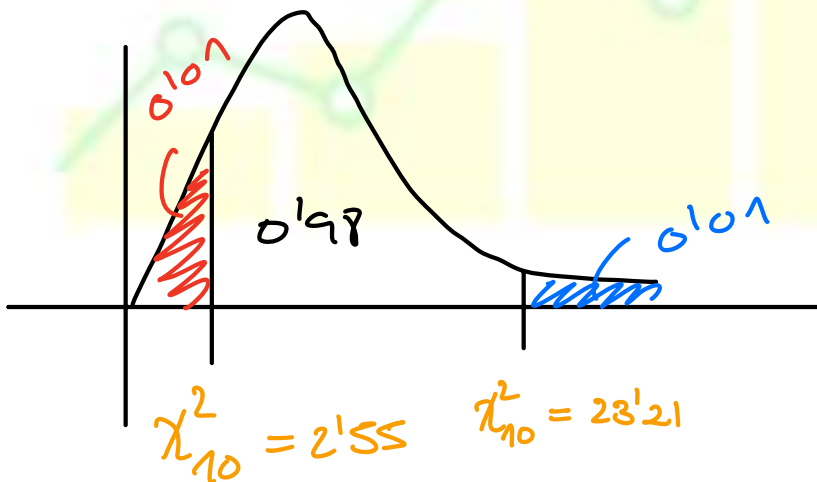
$$\chi_{10}^2 = 23,21$$

P		0,750	0,900	0,950	0,975	0,990	0,995	0,999
n	1	1,32	2,70	3,84	5,02	6,63	7,88	10,83
2	2,77	4,60	5,99	7,38	9,21	10,60	13,82	
3	4,11	6,25	7,81	9,35	11,34	12,84	16,27	
4	5,38	7,78	9,49	11,14	13,28	14,86	18,47	
5	6,63	9,24	11,07	12,83	15,09	16,75	20,52	
6	7,84	10,64	12,59	14,45	16,81	18,55	22,46	
7	9,04	12,02	14,07	16,01	18,48	20,28	24,32	
8	10,22	13,36	15,51	17,53	20,09	21,96	26,12	
9	11,39	14,68	16,92	19,02	21,67	23,59	27,88	
10	12,55	15,99	18,31	20,48	23,21	25,19	29,59	
11	13,70	17,28	19,68	21,92	24,72	26,76	31,26	
12	14,85	18,55	21,03	23,34	26,22	28,30	32,91	
13	15,98	19,81	22,36	24,74	27,69	29,82	34,53	
14	17,12	21,06	23,68	26,12	29,14	31,32	36,12	



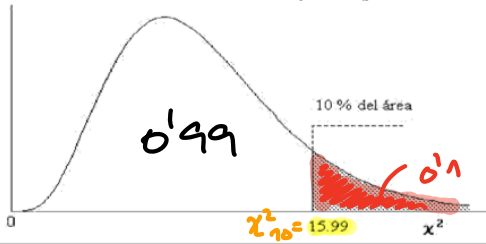
siendo X una variable aleatoria  $\chi^2$  de Pearson con n-grados de libertad.

P		0,005	0,010	0,025	0,050	0,100	0,250	0,500
n	1	0,0000	0,0001	0,0009	0,0039	0,0157	0,1015	0,454
2	0,0100	0,0101	0,0506	0,1026	0,2107	0,5754	1,386	
3	0,0717	0,148	0,2158	0,3518	0,5844	1,213	2,366	
4	0,2070	0,2971	0,4844	0,7107	1,064	1,923	3,357	
5	0,4117	0,5443	0,8312	1,145	1,610	2,675	4,351	
6	0,6757	0,8721	1,2373	1,635	2,204	3,455	5,348	
7	0,9893	1,249	1,690	2,167	2,833	4,255	6,346	
8	1,344	1,646	2,180	2,733	3,490	5,071	7,344	
9	1,735	2,088	2,700	3,325	4,168	5,899	8,343	
10	2,156	2,558	3,247	3,940	4,865	6,737	9,342	
11	2,603	3,053	3,816	4,575	5,578	7,584	10,34	
12	3,074	3,571	4,404	5,226	6,304	8,438	11,34	
13	3,565	4,107	5,009	5,892	7,041	9,299	12,34	
14	4,075	4,660	5,629	6,571	7,790	10,17	13,34	



### TABLA 3: DISTRIBUCIÓN $\chi^2$

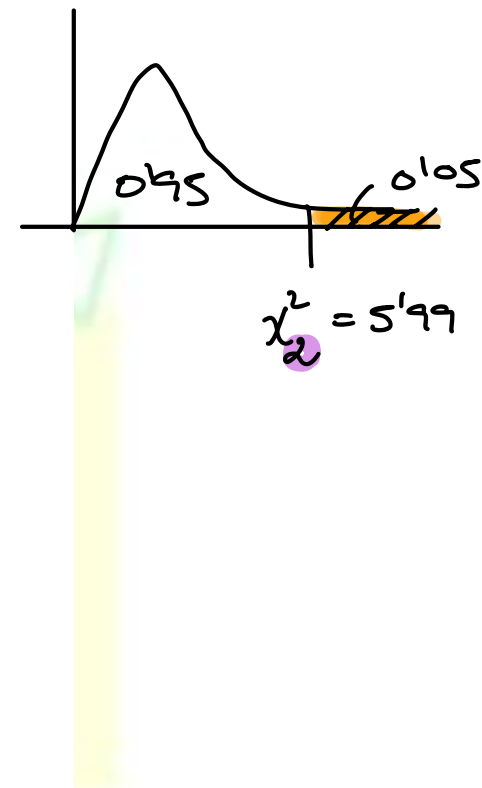
Puntos de porcentaje de la distribución  $\chi^2$



**Ejemplo:**  
Para  $\phi = 10$  grados de libertad

$$P[\chi^2 > 15.99] = 0.10$$

$\pi / \phi$	0.995	0.99	0.975	0.95	0.9	0.75	0.5	0.25	0.1	0.05	0.025	0.01	0.005	$\pi / \phi$
1	3.93E-05	1.57E-04	9.82E-04	3.93E-03	1.58E-02	0.102	0.455	1.323	2.71	3.84	5.02	6.63	7.88	1
2	1.00E-02	2.01E-02	5.06E-02	0.103	0.211	0.575	1.386	2.77	4.61	5.99	7.38	9.21	10.60	2
3	7.17E-02	0.115	0.216	0.352	0.584	1.213	2.37	4.11	6.25	7.81	9.35	11.34	12.84	3
4	0.207	0.297	0.484	0.711	1.064	1.923	3.36	5.39	7.78	9.49	11.14	13.28	14.86	4
5	0.412	0.554	0.831	1.145	1.610	2.67	4.35	6.63	9.24	11.07	12.83	15.09	16.75	5
6	0.676	0.872	1.237	1.635	2.20	3.45	5.35	7.84	10.64	12.59	14.45	16.81	18.55	6
7	0.989	1.239	1.690	2.17	2.83	4.25	6.35	9.04	12.02	14.07	16.01	18.48	20.3	7
8	1.344	1.647	2.18	2.73	3.49	5.07	7.34	10.22	13.36	15.51	17.53	20.1	22.0	8
9	1.735	2.09	2.70	3.33	4.17	5.90	8.34	11.39	14.68	16.92	19.02	21.7	23.6	9
10	2.16	2.56	3.25	3.94	4.87	6.74	9.34	12.55	15.99	18.31	20.5	23.2	25.2	10
11	2.60	3.05	3.82	4.57	5.58	7.58	10.34	13.70	17.28	19.68	21.9	24.7	26.8	11
12	3.07	3.57	4.40	5.23	6.30	8.44	11.34	14.85	18.55	21.0	23.3	26.2	28.3	12
13	3.57	4.11	5.01	5.89	7.04	9.30	12.34	15.98	19.81	22.4	24.7	27.7	29.8	13
14	4.07	4.66	5.63	6.57	7.79	10.17	13.34	17.12	21.1	23.7	26.1	29.1	31.3	14
15	4.60	5.23	6.26	7.26	8.55	11.04	14.34	18.25	22.3	25.0	27.5	30.6	32.8	15
16	5.14	5.81	6.91	7.96	9.31	11.91	15.34	19.37	23.5	26.3	28.8	32.0	34.3	16
17	5.70	6.41	7.56	8.67	10.09	12.79	16.34	20.5	24.8	27.6	30.2	33.4	35.7	17
18	6.26	7.01	8.23	9.39	10.86	13.68	17.34	21.6	26.0	28.9	31.5	34.8	37.2	18
19	6.84	7.63	8.91	10.12	11.65	14.56	18.34	22.7	27.2	30.1	32.9	36.2	38.6	19
20	7.43	8.26	9.59	10.85	12.44	15.45	19.34	23.8	28.4	31.4	34.2	37.6	40.0	20
21	8.03	8.90	10.28	11.59	13.24	16.34	20.3	24.9	29.6	32.7	35.5	38.9	41.4	21
22	8.64	9.54	10.98	12.34	14.04	17.24	21.3	26.0	30.8	33.9	36.8	40.3	42.8	22
23	9.26	10.20	11.69	13.09	14.85	18.14	22.3	27.1	32.0	35.2	38.1	41.6	44.2	23
24	9.89	10.86	12.40	13.85	15.66	19.04	23.3	28.2	33.2	36.4	39.4	43.0	45.6	24
25	10.52	11.52	13.12	14.61	16.47	19.94	24.3	29.3	34.4	37.7	40.6	44.3	46.9	25
26	11.16	12.20	13.84	15.38	17.29	20.8	25.3	30.4	35.6	38.9	41.9	45.6	48.3	26
27	11.81	12.88	14.57	16.15	18.11	21.7	26.3	31.5	36.7	40.1	43.2	47.0	49.6	27
28	12.46	13.56	15.31	16.93	18.94	22.7	27.3	32.6	37.9	41.3	44.5	48.3	51.0	28
29	13.12	14.26	16.05	17.71	19.77	23.6	28.3	33.7	39.1	42.6	45.7	49.6	52.3	29
30	13.79	14.95	16.79	18.49	20.6	24.5	29.3	34.8	40.3	43.8	47.0	50.9	53.7	30
40	20.7	22.2	24.4	26.5	29.1	33.7	39.3	45.6	51.8	55.8	59.3	63.7	66.8	40
50	28.0	29.7	32.4	34.8	37.7	42.9	49.3	56.3	63.2	67.5	71.4	76.2	79.5	50
60	35.5	37.5	40.5	43.2	46.5	52.3	59.3	67.0	74.4	79.1	83.3	88.4	92.0	60
70	43.3	45.4	48.8	51.7	55.3	61.7	69.3	77.6	85.5	90.5	95.0	100.4	104.2	70
80	51.2	53.5	57.2	60.4	64.3	71.1	79.3	88.1	96.6	101.9	106.6	112.3	116.3	80
90	59.2	61.8	65.6	69.1	73.3	80.6	89.3	98.6	107.6	113.1	118.1	124.1	128.3	90
100	67.3	70.1	74.2	77.9	82.4	90.1	99.3	109.1	118.5	124.3	129.6	135.8	140.2	100
$Z_\alpha$	-2.58	-2.33	-1.96	-1.64	-1.28	-0.674	0.000	0.674	1.282	1.645	1.96	2.33	2.58	$Z_\alpha$



Para  $\phi > 100$  tócese  $\chi^2 = \frac{1}{2}(Z_\alpha + \sqrt{2\phi - 1})^2$ .  $Z_\alpha$  es la desviación normal estandarizada correspondiente al nivel de significancia y se muestra en la parte superior de la tabla.