Statistiques pour Mathématiciens: Glossaire et Tables

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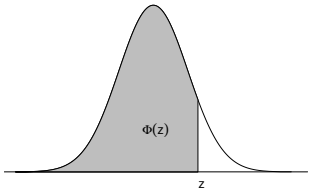
Mathematics	English	Français
	random experiment	une expérience aléatoire
Ω	sample space	l'ensemble fondamental
ω	outcome, elementary event	une épreuve, un événement élémentaire
$A, B, \ldots$	event	un événement
$\mathcal{F}$	event space	l'espace des événements
	sigma-algebra	une tribu
$\Pr$	probability distribution/probability function	une loi de probabilité
$(\Omega, \mathcal{F}, \Pr)$	probability space	un espace de probabilité
	inclusion-exclusion formulae	formule d'inclusion-exclusion
$\Pr(A \mid B)$	probability of A given B	la probabilité de A sachant B
	independence	indépendance
	(mutually) independent events	les événements (mutuellement) indépendants
	pairwise independent events	les événements indépendants deux à deux
	conditionally independent events	les événements conditionellement indépendants
$X, Y, \ldots$	random variable	une variable aléatoire
I	indicator random variable	une variable indicatrice
f_X	probability mass function	fonction de masse
F_X	probability distribution function	fonction de répartition
$\mathrm{E}(X)$	expected value/expectation of X	l'espérance de X
$\mathrm{E}(X^r)$	rth moment of X	$r$ième moment de X
$\mathrm{var}(X)$	variance of X	la variance de X
$M_X(t)$	moment generating function (MGF) of X	la fonction génératrice des moments (FGM)
$K_X(t)$	cumulant generating function (CGF) of X	la fonction génératrice des cumulants (FGC)
κ_r	rth cumulant of X	$r$ième cumulant de X
$\phi_X(t)$	characteristic function of X, or	la fonction characteristique
$\stackrel{D}{=}$	has the same distribution as	a la même loi que
$\xrightarrow{D}$	converges in distribution to	converge en loi vers
$\xrightarrow{P}$	converges in probability to	converge en probabilité vers
$\xrightarrow{2}$	converges in mean square to	converge en moyenne carrée vers
$\xrightarrow{\text{a.s.}}$	converges almost surely to	converge presque surement vers
$X_{(r)}$	rth order statistic	$r$ieme statistique d'ordre
$y = (y_1, \ldots, y_n)$	(observed) data, sample	données (observées), échantillon observé
	dataset	un jeu de données
$Y = (Y_1, \ldots, Y_n)$	random sample	échantillon aléatoire
F, f	probability model, statistical model	loi de probabilité, modèle statistique
$\theta, \mu, \sigma^2, \ldots$	parameter	un paramètre
x_p	quantile	quantile
$x_{0.5}$	median	la médiane
$x_{0.25}, x_{0.75}$	upper and lower quartiles	les quartiles supérieure et inférieure
$\widehat{f}_h$	kernel density estimate	estimation de noyau de densité
	probability (quantile-quantile, Q-Q) plot	Q-Q plot
	boxplot	boxplot
$T = t(Y)$	estimator	un estimateur
$t = t(y)$	estimate	une estimation
$V^{1/2} = v^{1/2}(Y)$	standard error	un écart-type
$Q = q(Y, \theta)$	pivot	un pivot
(L, U)	confidence interval	un intervalle de confiance
$\ell(\theta)$	likelihood	la vraisemblance
$\widehat{\theta}$	maximum likelihood estimate(or) (MLE)	l'estimation(eur) de maximum du vraisemblance
$W(\theta)$	likelihood ratio statistic	statistique du rapport de vraisemblances
$R(\theta)$	likelihood root	la racine de la vraisemblance
$J(\theta)$	observed information	l'information observée
$I(\theta)$	expected/Fisher information	l'information de Fisher
$\exp(\lambda)$	exponential distribution, parameter λ	loi exponentielle, paramètre λ
$\mathcal{N}(\mu, \sigma^2)$	normal distribution, mean μ, variance σ^2	loi normale, espérance μ, variance σ^2
t_ν	Student t distribution with ν degrees of freedom	loi de Student avec ν degrés de liberté
χ^2_ν	chi-squared distribution with ν degrees of freedom	loi chi-deux avec ν degrés de liberté
df	degrees of freedom	degrés de liberté
	sufficient statistic	statistique exhaustive
	complete statistic	statistique complète

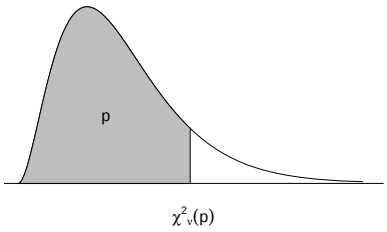
Distribution normale standard $\Phi(z)$



Pour $z < 0$ on utilise symmetrie: $P(Z \leq z) = \Phi(z) = 1 - \Phi(-z)$, $z \in \mathbb{R}$.

z	0	1	2	3	4	5	6	7	8	9
0.0	.50000	.50399	.50798	.51197	.51595	.51994	.52392	.52790	.53188	.53586
0.1	.53983	.54380	.54776	.55172	.55567	.55962	.56356	.56750	.57142	.57535
0.2	.57926	.58317	.58706	.59095	.59483	.59871	.60257	.60642	.61026	.61409
0.3	.61791	.62172	.62552	.62930	.63307	.63683	.64058	.64431	.64803	.65173
0.4	.65542	.65910	.66276	.66640	.67003	.67364	.67724	.68082	.68439	.68793
0.5	.69146	.69497	.69847	.70194	.70540	.70884	.71226	.71566	.71904	.72240
0.6	.72575	.72907	.73237	.73565	.73891	.74215	.74537	.74857	.75175	.75490
0.7	.75804	.76115	.76424	.76730	.77035	.77337	.77637	.77935	.78230	.78524
0.8	.78814	.79103	.79389	.79673	.79955	.80234	.80511	.80785	.81057	.81327
0.9	.81594	.81859	.82121	.82381	.82639	.82894	.83147	.83398	.83646	.83891
1.0	.84134	.84375	.84614	.84850	.85083	.85314	.85543	.85769	.85993	.86214
1.1	.86433	.86650	.86864	.87076	.87286	.87493	.87698	.87900	.88100	.88298
1.2	.88493	.88686	.88877	.89065	.89251	.89435	.89617	.89796	.89973	.90147
1.3	.90320	.90490	.90658	.90824	.90988	.91149	.91309	.91466	.91621	.91774
1.4	.91924	.92073	.92220	.92364	.92507	.92647	.92786	.92922	.93056	.93189
1.5	.93319	.93448	.93574	.93699	.93822	.93943	.94062	.94179	.94295	.94408
1.6	.94520	.94630	.94738	.94845	.94950	.95053	.95154	.95254	.95352	.95449
1.7	.95543	.95637	.95728	.95818	.95907	.95994	.96080	.96164	.96246	.96327
1.8	.96407	.96485	.96562	.96638	.96712	.96784	.96856	.96926	.96995	.97062
1.9	.97128	.97193	.97257	.97320	.97381	.97441	.97500	.97558	.97615	.97670
2.0	.97725	.97778	.97831	.97882	.97932	.97982	.98030	.98077	.98124	.98169
2.1	.98214	.98257	.98300	.98341	.98382	.98422	.98461	.98500	.98537	.98574
2.2	.98610	.98645	.98679	.98713	.98745	.98778	.98809	.98840	.98870	.98899
2.3	.98928	.98956	.98983	.99010	.99036	.99061	.99086	.99111	.99134	.99158
2.4	.99180	.99202	.99224	.99245	.99266	.99286	.99305	.99324	.99343	.99361
2.5	.99379	.99396	.99413	.99430	.99446	.99461	.99477	.99492	.99506	.99520
2.6	.99534	.99547	.99560	.99573	.99585	.99598	.99609	.99621	.99632	.99643
2.7	.99653	.99664	.99674	.99683	.99693	.99702	.99711	.99720	.99728	.99736
2.8	.99744	.99752	.99760	.99767	.99774	.99781	.99788	.99795	.99801	.99807
2.9	.99813	.99819	.99825	.99831	.99836	.99841	.99846	.99851	.99856	.99861
3.0	.99865	.99869	.99874	.99878	.99882	.99886	.99889	.99893	.99896	.99900
3.1	.99903	.99906	.99910	.99913	.99916	.99918	.99921	.99924	.99926	.99929
3.2	.99931	.99934	.99936	.99938	.99940	.99942	.99944	.99946	.99948	.99950
3.3	.99952	.99953	.99955	.99957	.99958	.99960	.99961	.99962	.99964	.99965
3.4	.99966	.99968	.99969	.99970	.99971	.99972	.99973	.99974	.99975	.99976
3.5	.99977	.99978	.99978	.99979	.99980	.99981	.99981	.99982	.99983	.99983
3.6	.99984	.99985	.99985	.99986	.99986	.99987	.99987	.99988	.99988	.99989
3.7	.99989	.99990	.99990	.99990	.99991	.99991	.99992	.99992	.99992	.99992
3.8	.99993	.99993	.99993	.99994	.99994	.99994	.99994	.99995	.99995	.99995
3.9	.99995	.99995	.99996	.99996	.99996	.99996	.99996	.99996	.99997	.99997

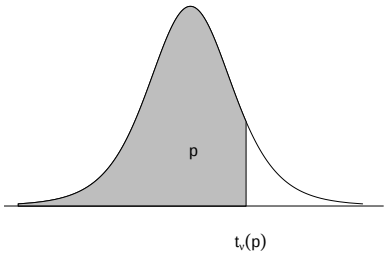
Distribution χ^2_ν



Des quantiles $c_\nu(p)$ pour la distribution en khi-carré à ν degrés de liberté.

ν	.005	.01	.025	.05	.10	.25	.50	.75	.90	.95	.975	.99	.995	.999
1	0	.0002	.010	.0039	.0158	.102	.455	1.32	2.71	3.84	5.02	6.63	7.88	10.8
2	.0100	.0201	.0506	.103	.211	.575	1.39	2.77	4.61	5.99	7.38	9.21	10.6	13.8
3	.0717	.115	.216	.352	.584	1.21	2.37	4.11	6.25	7.81	9.35	11.3	12.8	16.3
4	.207	.297	.484	.711	1.06	1.92	3.36	5.39	7.78	9.49	11.1	13.3	14.9	18.5
5	.412	.554	.831	1.15	1.61	2.67	4.35	6.63	9.24	11.1	12.8	15.1	16.7	20.5
6	.676	.872	1.24	1.64	2.20	3.45	5.35	7.84	10.6	12.6	14.4	16.8	18.5	22.5
7	.989	1.24	1.69	2.17	2.83	4.25	6.35	9.04	12.0	14.1	16.0	18.5	20.3	24.3
8	1.34	1.65	2.18	2.73	3.49	5.07	7.34	10.2	13.4	15.5	17.5	20.1	22.0	26.1
9	1.73	2.09	2.70	3.33	4.17	5.90	8.34	11.4	14.7	16.9	19.0	21.7	23.6	27.9
10	2.16	2.56	3.25	3.94	4.87	6.74	9.34	12.5	16.0	18.3	20.5	23.2	25.2	29.6
11	2.60	3.05	3.82	4.57	5.58	7.58	10.3	13.7	17.3	19.7	21.9	24.7	26.8	31.3
12	3.07	3.57	4.40	5.23	6.30	8.44	11.3	14.8	18.5	21.0	23.3	26.2	28.3	32.9
13	3.57	4.11	5.01	5.89	7.04	9.30	12.3	16.0	19.8	22.4	24.7	27.7	29.8	34.5
14	4.07	4.66	5.63	6.57	7.79	10.2	13.3	17.1	21.1	23.7	26.1	29.1	31.3	36.1
15	4.60	5.23	6.26	7.26	8.55	11.0	14.3	18.2	22.3	25.0	27.5	30.6	32.8	37.7
16	5.14	5.81	6.91	7.96	9.31	11.9	15.3	19.4	23.5	26.3	28.8	32.0	34.3	39.3
17	5.70	6.41	7.56	8.67	10.1	12.8	16.3	20.5	24.8	27.6	30.2	33.4	35.7	40.8
18	6.26	7.01	8.23	9.39	10.9	13.7	17.3	21.6	26.0	28.9	31.5	34.8	37.2	42.3
19	6.84	7.63	8.91	10.1	11.7	14.6	18.3	22.7	27.2	30.1	32.9	36.2	38.6	43.8
20	7.43	8.26	9.59	10.9	12.4	15.5	19.3	23.8	28.4	31.4	34.2	37.6	40.0	45.3
21	8.03	8.90	10.3	11.6	13.2	16.3	20.3	24.9	29.6	32.7	35.5	38.9	41.4	46.8
22	8.64	9.54	11.0	12.3	14.0	17.2	21.3	26.0	30.8	33.9	36.8	40.3	42.8	48.3
23	9.26	10.2	11.7	13.1	14.8	18.1	22.3	27.1	32.0	35.2	38.1	41.6	44.2	49.7
24	9.89	10.9	12.4	13.8	15.7	19.0	23.3	28.2	33.2	36.4	39.4	43.0	45.6	51.2
25	10.5	11.5	13.1	14.6	16.5	19.9	24.3	29.3	34.4	37.7	40.6	44.3	46.9	52.6
26	11.2	12.2	13.8	15.4	17.3	20.8	25.3	30.4	35.6	38.9	41.9	45.6	48.3	54.1
27	11.8	12.9	14.6	16.2	18.1	21.7	26.3	31.5	36.7	40.1	43.2	47.0	49.6	55.5
28	12.5	13.6	15.3	16.9	18.9	22.7	27.3	32.6	37.9	41.3	44.5	48.3	51.0	56.9
29	13.1	14.3	16.0	17.7	19.8	23.6	28.3	33.7	39.1	42.6	45.7	49.6	52.3	58.3
30	13.8	15.0	16.8	18.5	20.6	24.5	29.3	34.8	40.3	43.8	47.0	50.9	53.7	59.7
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	73.4
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	86.7
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	99.6
70	43.3	45.4	48.8	51.7	55.3	61.7	69.3	77.6	85.5	90.5	95.0	100.	104.	112.

Distribution t_ν de Student



Des quantiles $t_\nu(p)$ pour la distribution t de Student à ν degrés de liberté.

Pour $p < 0$ on utilise la symmétrie: $t_\nu(p) = -t_\nu(1-p)$.

ν	.75	.9	.95	.975	.99	.995
1	1.000	3.078	6.314	12.71	31.82	63.66
2	.8165	1.886	2.920	4.303	6.965	9.925
3	.7649	1.638	2.353	3.182	4.541	5.841
4	.7407	1.533	2.132	2.776	3.747	4.604
5	.7267	1.476	2.015	2.571	3.365	4.032
6	.7176	1.440	1.943	2.447	3.143	3.707
7	.7111	1.415	1.895	2.365	2.998	3.499
8	.7064	1.397	1.860	2.306	2.896	3.355
9	.7027	1.383	1.833	2.262	2.821	3.250
10	.6998	1.372	1.812	2.228	2.764	3.169
11	.6974	1.363	1.796	2.201	2.718	3.106
12	.6955	1.356	1.782	2.179	2.681	3.055
13	.6938	1.350	1.771	2.160	2.650	3.012
14	.6924	1.345	1.761	2.145	2.624	2.977
15	.6912	1.341	1.753	2.131	2.602	2.947
16	.6901	1.337	1.746	2.120	2.583	2.921
17	.6892	1.333	1.740	2.110	2.567	2.898
18	.6884	1.330	1.734	2.101	2.552	2.878
19	.6876	1.328	1.729	2.093	2.539	2.861
20	.6870	1.325	1.725	2.086	2.528	2.845
21	.6864	1.323	1.721	2.080	2.518	2.831
22	.6858	1.321	1.717	2.074	2.508	2.819
23	.6853	1.319	1.714	2.069	2.500	2.807
24	.6848	1.318	1.711	2.064	2.492	2.797
25	.6844	1.316	1.708	2.060	2.485	2.787
26	.6840	1.315	1.706	2.056	2.479	2.779
27	.6837	1.314	1.703	2.052	2.473	2.771
28	.6834	1.313	1.701	2.048	2.467	2.763
29	.6830	1.311	1.699	2.045	2.462	2.756
30	.6828	1.310	1.697	2.042	2.457	2.750
40	.6807	1.303	1.684	2.021	2.423	2.704
50	.6794	1.299	1.676	2.009	2.403	2.678
100	.6770	1.290	1.660	1.984	2.364	2.626
∞	.6745	1.282	1.645	1.960	2.326	2.576