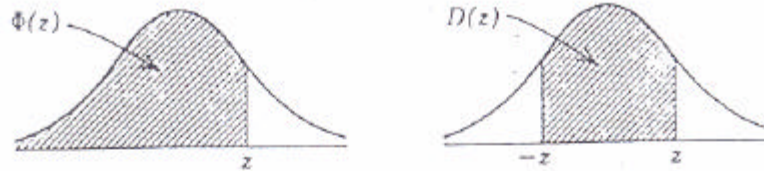


Normal Distribution

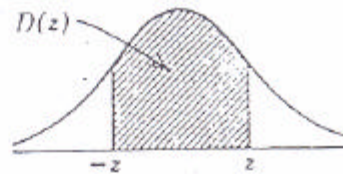
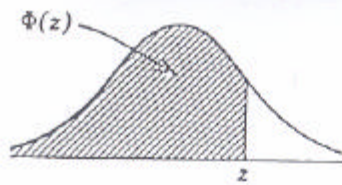
Table 3a. Distribution Function (3),



$D(z) = \Phi(z) - \Phi(-z)$
 $\Phi(-z) = 1 - \Phi(z), \quad \Phi(0) = 0.5$

More extended tables: National Bureau of Standards (1953), Hald (1962). Index for further tables: Greenwood and Hartley (1961) (cf. Appendix 3).

<i>z</i>	$\Phi(-z)$	$\Phi(z)$	<i>D(z)</i>	<i>z</i>	$\Phi(-z)$	$\Phi(z)$	<i>D(z)</i>	<i>z</i>	$\Phi(-z)$	$\Phi(z)$	<i>D(z)</i>
	0.	0.	0.		0.	0.	0.		0.	0.	0.
0.01	4960	5040	0080	0.51	3050	6250	3899	1.01	1562	8438	6875
0.02	4920	5080	0160	0.52	3015	6985	3969	1.02	1539	8461	6923
0.03	4880	5120	0239	0.53	2981	7019	4039	1.03	1515	8485	6970
0.04	4840	5160	0319	0.54	2946	7054	4108	1.04	1492	8508	7017
0.05	4801	5199	0399	0.55	2912	7088	4177	1.05	1469	8531	7063
0.06	4761	5239	0478	0.56	2877	7123	4245	1.06	1446	8554	7109
0.07	4721	5279	0558	0.57	2843	7157	4313	1.07	1423	8577	7154
0.08	4681	5319	0638	0.58	2810	7190	4381	1.08	1401	8599	7199
0.09	4641	5359	0717	0.59	2776	7224	4448	1.09	1379	8621	7243
0.10	4602	5398	0797	0.60	2743	7257	4515	1.10	1357	8643	7287
0.11	4562	5438	0876	0.61	2709	7291	4581	1.11	1335	8665	7330
0.12	4522	5478	0955	0.62	2676	7324	4647	1.12	1314	8686	7373
0.13	4483	5517	1034	0.63	2643	7357	4713	1.13	1292	8708	7415
0.14	4443	5557	1113	0.64	2611	7389	4778	1.14	1271	8729	7457
0.15	4404	5596	1192	0.65	2578	7422	4843	1.15	1251	8749	7499
0.16	4364	5636	1271	0.66	2546	7454	4907	1.16	1230	8770	7540
0.17	4325	5675	1350	0.67	2514	7486	4971	1.17	1210	8790	7580
0.18	4286	5714	1428	0.68	2483	7517	5035	1.18	1190	8810	7620
0.19	4247	5753	1507	0.69	2451	7549	5098	1.19	1170	8830	7660
0.20	4207	5793	1585	0.70	2420	7580	5161	1.20	1151	8849	7699
0.21	4168	5832	1663	0.71	2389	7611	5223	1.21	1131	8869	7737
0.22	4129	5871	1741	0.72	2358	7642	5285	1.22	1112	8888	7775
0.23	4090	5910	1819	0.73	2327	7673	5346	1.23	1093	8907	7813
0.24	4052	5948	1897	0.74	2296	7704	5407	1.24	1075	8925	7850
0.25	4013	5987	1974	0.75	2266	7734	5467	1.25	1056	8944	7887
0.26	3974	6026	2051	0.76	2236	7764	5527	1.26	1038	8962	7923
0.27	3936	6064	2128	0.77	2206	7794	5587	1.27	1020	8980	7959
0.28	3897	6103	2205	0.78	2177	7823	5646	1.28	1003	8997	7995
0.29	3859	6141	2282	0.79	2148	7852	5705	1.29	0985	9015	8029
0.30	3821	6179	2358	0.80	2119	7881	5763	1.30	0968	9032	8064
0.31	3783	6217	2434	0.81	2090	7910	5821	1.31	0951	9049	8098
0.32	3745	6255	2510	0.82	2061	7939	5878	1.32	0934	9066	8132
0.33	3707	6293	2586	0.83	2033	7967	5935	1.33	0918	9082	8165
0.34	3669	6331	2661	0.84	2005	7995	5991	1.34	0901	9099	8198
0.35	3632	6368	2737	0.85	1977	8023	6047	1.35	0885	9115	8230
0.36	3594	6406	2812	0.86	1949	8051	6102	1.36	0869	9131	8262
0.37	3557	6443	2886	0.87	1922	8078	6157	1.37	0853	9147	8293
0.38	3520	6480	2961	0.88	1894	8106	6211	1.38	0838	9162	8324
0.39	3483	6517	3035	0.89	1867	8133	6265	1.39	0823	9177	8355
0.40	3446	6554	3108	0.90	1841	8159	6319	1.40	0808	9192	8385
0.41	3409	6591	3182	0.91	1814	8186	6372	1.41	0793	9207	8415
0.42	3372	6628	3255	0.92	1788	8212	6424	1.42	0778	9222	8444
0.43	3336	6664	3328	0.93	1762	8238	6476	1.43	0764	9236	8473
0.44	3300	6700	3401	0.94	1736	8264	6528	1.44	0749	9251	8501
0.45	3264	6736	3473	0.95	1711	8289	6579	1.45	0735	9265	8529
0.46	3228	6772	3545	0.96	1685	8315	6629	1.46	0721	9279	8557
0.47	3192	6808	3616	0.97	1660	8340	6680	1.47	0708	9292	8584
0.48	3156	6844	3688	0.98	1635	8365	6729	1.48	0694	9306	8611
0.49	3121	6879	3759	0.99	1611	8389	6778	1.49	0681	9319	8638
0.50	3085	6915	3829	1.00	1587	8413	6827	1.50	0668	9332	8664



z	$\Phi(-z)$	$\Phi(z)$	$D(z)$
	0.	0.	0.
1.51	0655	9345	8690
1.52	0643	9357	8715
1.53	0630	9370	8740
1.54	0618	9382	8764
1.55	0606	9394	8789
1.56	0594	9406	8812
1.57	0582	9418	8836
1.58	0571	9429	8859
1.59	0559	9441	8882
1.60	0548	9452	8904
1.61	0537	9463	8926
1.62	0526	9474	8948
1.63	0516	9484	8969
1.64	0505	9495	8990
1.65	0495	9505	9011
1.66	0485	9515	9031
1.67	0475	9525	9051
1.68	0465	9535	9070
1.69	0455	9545	9090
1.70	0446	9554	9109
1.71	0436	9564	9127
1.72	0427	9573	9146
1.73	0418	9582	9164
1.74	0409	9591	9181
1.75	0401	9599	9199
1.76	0392	9608	9216
1.77	0384	9616	9233
1.78	0375	9625	9249
1.79	0367	9633	9265
1.80	0359	9641	9281
1.81	0351	9649	9297
1.82	0344	9656	9312
1.83	0336	9664	9328
1.84	0329	9671	9342
1.85	0322	9678	9357
1.86	0314	9686	9371
1.87	0307	9693	9385
1.88	0301	9699	9399
1.89	0294	9706	9412
1.90	0287	9713	9426
1.91	0281	9719	9439
1.92	0274	9726	9451
1.93	0268	9732	9464
1.94	0262	9738	9476
1.95	0256	9744	9488
1.96	0250	9750	9500
1.97	0244	9756	9512
1.98	0239	9761	9523
1.99	0233	9767	9534
2.00	0228	9772	9545

z	$\Phi(-z)$	$\Phi(z)$	$D(z)$
	0.	0.	0.
2.01	0222	9778	9556
2.02	0217	9783	9566
2.03	0212	9788	9576
2.04	0207	9793	9586
2.05	0202	9798	9596
2.06	0197	9803	9606
2.07	0192	9808	9615
2.08	0188	9812	9625
2.09	0183	9817	9634
2.10	0179	9821	9643
2.11	0174	9826	9651
2.12	0170	9830	9660
2.13	0166	9834	9668
2.14	0162	9838	9676
2.15	0158	9842	9684
2.16	0154	9846	9692
2.17	0150	9850	9700
2.18	0146	9854	9707
2.19	0143	9857	9715
2.20	0139	9861	9722
2.21	0136	9864	9729
2.22	0132	9868	9736
2.23	0129	9871	9743
2.24	0125	9875	9749
2.25	0122	9878	9756
2.26	0119	9881	9762
2.27	0116	9884	9768
2.28	0113	9887	9774
2.29	0110	9890	9780
2.30	0107	9893	9786
2.31	0104	9896	9791
2.32	0102	9898	9797
2.33	0099	9901	9802
2.34	0096	9904	9807
2.35	0094	9906	9812
2.36	0091	9909	9817
2.37	0089	9911	9822
2.38	0087	9913	9827
2.39	0084	9916	9832
2.40	0082	9918	9836
2.41	0080	9920	9840
2.42	0078	9922	9845
2.43	0075	9925	9849
2.44	0073	9927	9853
2.45	0071	9929	9857
2.46	0069	9931	9861
2.47	0068	9932	9865
2.48	0066	9934	9869
2.49	0064	9936	9872
2.50	0062	9938	9876

z	$\Phi(-z)$	$\Phi(z)$	$D(z)$
	0.	0.	0.
2.51	0060	9940	9879
2.52	0059	9941	9883
2.53	0057	9943	9886
2.54	0055	9945	9889
2.55	0054	9946	9892
2.56	0052	9948	9895
2.57	0051	9949	9898
2.58	0049	9951	9901
2.59	0048	9952	9904
2.60	0047	9953	9907
2.61	0045	9955	9909
2.62	0044	9956	9912
2.63	0043	9957	9915
2.64	0041	9959	9917
2.65	0040	9960	9920
2.66	0039	9961	9922
2.67	0038	9962	9924
2.68	0037	9963	9926
2.69	0036	9964	9929
2.70	0035	9965	9931
2.71	0034	9966	9933
2.72	0033	9967	9935
2.73	0032	9968	9937
2.74	0031	9969	9939
2.75	0030	9970	9940
2.76	0029	9971	9942
2.77	0028	9972	9944
2.78	0027	9973	9946
2.79	0026	9974	9947
2.80	0026	9974	9949
2.81	0025	9975	9950
2.82	0024	9976	9952
2.83	0023	9977	9953
2.84	0023	9977	9955
2.85	0022	9978	9956
2.86	0021	9979	9958
2.87	0021	9979	9959
2.88	0020	9980	9960
2.89	0019	9981	9961
2.90	0019	9981	9963
2.91	0018	9982	9964
2.92	0018	9982	9965
2.93	0017	9983	9966
2.94	0016	9984	9967
2.95	0016	9984	9968
2.96	0015	9985	9969
2.97	0015	9985	9970
2.98	0014	9986	9971
2.99	0014	9986	9972
3.00	0013	9987	9973

Table 3b. Normal Distribution. Values of z for Given Values of (3), Sec. 8.2, and $D(z)$

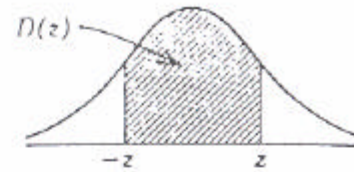
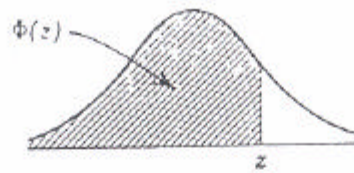
$$D(z) = \Phi(z) - \Phi(-z)$$

Example. $\Phi(z) = 61\%$

for $z = 0.279$,

$D(z) = 61\%$ for $z = 0.860$

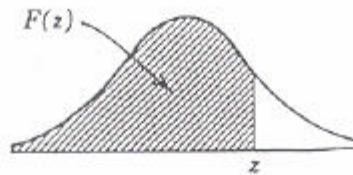
More extended tables: Comrie (1949), Fisher and Yates (1957), Hald (1962), Kelley (1948) (cf. Appendix 3).



%	$z(\Phi)$	$z(D)$	%	$z(\Phi)$	$z(D)$	%	$z(\Phi)$	$z(D)$
1	-2.326	0.013	41	-0.228	0.539	81	0.878	1.311
2	-2.054	0.025	42	-0.202	0.553	82	0.915	1.341
3	-1.881	0.038	43	-0.176	0.568	83	0.954	1.372
4	-1.751	0.050	44	-0.151	0.583	84	0.994	1.405
5	-1.645	0.063	45	-0.126	0.598	85	1.036	1.440
6	-1.555	0.075	46	-0.100	0.613	86	1.080	1.476
7	-1.476	0.088	47	-0.075	0.628	87	1.126	1.514
8	-1.405	0.100	48	-0.050	0.643	88	1.175	1.555
9	-1.341	0.113	49	-0.025	0.659	89	1.227	1.598
10	-1.282	0.126	50	0.000	0.674	90	1.282	1.645
11	-1.227	0.138	51	0.025	0.690	91	1.341	1.695
12	-1.175	0.151	52	0.050	0.706	92	1.405	1.751
13	-1.126	0.164	53	0.075	0.722	93	1.476	1.812
14	-1.080	0.176	54	0.100	0.739	94	1.555	1.881
15	-1.036	0.189	55	0.126	0.755	95	1.645	1.960
16	-0.994	0.202	56	0.151	0.772	96	1.751	2.054
17	-0.954	0.215	57	0.176	0.789	97	1.881	2.170
18	-0.915	0.228	58	0.202	0.806	97.5	1.960	2.241
19	-0.878	0.240	59	0.228	0.824	98	2.054	2.326
20	-0.842	0.253	60	0.253	0.842	99	2.326	2.576
21	-0.806	0.266	61	0.279	0.860	99.1	2.366	2.612
22	-0.772	0.279	62	0.305	0.878	99.2	2.409	2.652
23	-0.739	0.292	63	0.332	0.896	99.3	2.457	2.697
24	-0.706	0.305	64	0.358	0.915	99.4	2.512	2.748
25	-0.674	0.319	65	0.385	0.935	99.5	2.576	2.807
26	-0.643	0.332	66	0.412	0.954	99.6	2.652	2.878
27	-0.613	0.345	67	0.440	0.974	99.7	2.748	2.968
28	-0.583	0.358	68	0.468	0.994	99.8	2.878	3.090
29	-0.553	0.372	69	0.496	1.015	99.9	3.090	3.291
30	-0.524	0.385	70	0.524	1.036			
31	-0.496	0.399	71	0.553	1.058	99.91	3.121	3.320
32	-0.468	0.412	72	0.583	1.080	99.92	3.156	3.353
33	-0.440	0.426	73	0.613	1.103	99.93	3.195	3.390
34	-0.412	0.440	74	0.643	1.126	99.94	3.239	3.432
35	-0.385	0.454	75	0.674	1.150	99.95	3.291	3.481
36	-0.358	0.468	76	0.706	1.175	99.96	3.353	3.540
37	-0.332	0.482	77	0.739	1.200	99.97	3.432	3.615
38	-0.305	0.496	78	0.772	1.227	99.98	3.540	3.719
39	-0.279	0.510	79	0.806	1.254	99.99	3.719	3.891
40	-0.253	0.524	80	0.842	1.282			

Student s t-Distribution

Table 8. Values of z for Given Values of the Distribution Function (3) in Sec. 10.3
 More extended tables: Fisher (1958), Hald (1962), Pearson and Hartley (1954) (cf. Appendix 3).



Example. For 9 degrees of freedom, $F(z) = 0.95$ when $z = 1.83$.

$$F(-z) = 1 - F(z).$$

Example. For 9 degrees of freedom, $F(-1.83) = 1 - F(1.83) = 1 - 0.95 = 0.05$.

$F(z)$	Number of Degrees of Freedom									
	1	2	3	4	5	6	7	8	9	10
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.33	0.29	0.28	0.27	0.27	0.27	0.26	0.26	0.26	0.26
0.7	0.73	0.62	0.58	0.57	0.56	0.55	0.55	0.55	0.54	0.54
0.8	1.38	1.06	0.98	0.94	0.92	0.91	0.90	0.89	0.88	0.88
0.9	3.08	1.89	1.64	1.53	1.48	1.44	1.42	1.40	1.38	1.37
0.95	6.31	2.92	2.35	2.13	2.02	1.94	1.90	1.86	1.83	1.81
0.975	12.7	4.30	3.18	2.78	2.57	2.45	2.37	2.31	2.26	2.23
0.99	31.8	6.97	4.54	3.75	3.37	3.14	3.00	2.90	2.82	2.76
0.995	63.7	9.93	5.84	4.60	4.03	3.71	3.50	3.36	3.25	3.17
0.999	318.3	22.3	10.2	7.17	5.89	5.21	4.79	4.50	4.30	4.14

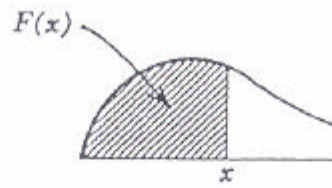
$F(z)$	Number of Degrees of Freedom									
	11	12	13	14	15	16	17	18	19	20
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.26
0.7	0.54	0.54	0.54	0.54	0.54	0.54	0.53	0.53	0.53	0.53
0.8	0.88	0.87	0.87	0.87	0.87	0.87	0.86	0.86	0.86	0.86
0.9	1.36	1.36	1.35	1.35	1.34	1.34	1.33	1.33	1.33	1.33
0.95	1.80	1.78	1.77	1.76	1.75	1.75	1.74	1.73	1.73	1.73
0.975	2.20	2.18	2.16	2.15	2.13	2.12	2.11	2.10	2.09	2.09
0.99	2.72	2.68	2.65	2.62	2.60	2.58	2.57	2.55	2.54	2.53
0.995	3.11	3.06	3.01	2.98	2.95	2.92	2.90	2.88	2.86	2.85
0.999	4.03	3.93	3.85	3.79	3.73	3.69	3.65	3.61	3.58	3.55

$F(z)$	Number of Degrees of Freedom									
	22	24	26	28	30	40	50	100	200	∞
0.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.6	0.26	0.26	0.26	0.26	0.26	0.26	0.26	0.25	0.25	0.25
0.7	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.52
0.8	0.86	0.86	0.86	0.86	0.85	0.85	0.85	0.85	0.84	0.84
0.9	1.32	1.32	1.32	1.31	1.31	1.30	1.30	1.29	1.29	1.28
0.95	1.72	1.71	1.71	1.70	1.70	1.68	1.68	1.66	1.65	1.65
0.975	2.07	2.06	2.06	2.05	2.04	2.02	2.01	1.98	1.97	1.96
0.99	2.51	2.49	2.48	2.47	2.46	2.42	2.40	2.37	2.35	2.33
0.995	2.82	2.80	2.78	2.76	2.75	2.70	2.68	2.63	2.60	2.58
0.999	3.51	3.47	3.44	3.41	3.39	3.31	3.26	3.17	3.13	3.09

Chi-Square Distribution

Table 6. Values of x for Given Values of the Distribution Function (3) in Sec. 10.1

More extended tables: Fisher (1958), Hald (1962), Pearson and Hartley (1954) (cf. Appendix 3).

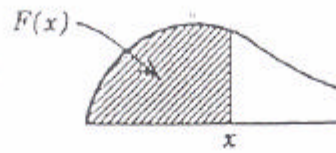


Example. For 3 degrees of freedom, $F = 0.99$ when $x = 11.34$.

$F(x)$	Number of Degrees of Freedom									
	1	2	3	4	5	6	7	8	9	10
0.001	0.00	0.00	0.02	0.09	0.21	0.38	0.60	0.86	1.15	1.48
0.005	0.00	0.01	0.07	0.21	0.41	0.68	0.99	1.34	1.73	2.16
0.01	0.00	0.02	0.11	0.30	0.55	0.87	1.24	1.65	2.09	2.56
0.025	0.00	0.05	0.22	0.48	0.83	1.24	1.69	2.18	2.70	3.25
0.05	0.00	0.10	0.35	0.71	1.15	1.64	2.17	2.73	3.33	3.94
0.1	0.02	0.21	0.58	1.06	1.61	2.20	2.83	3.49	4.17	4.87
0.25	0.10	0.58	1.21	1.92	2.67	3.45	4.25	5.07	5.90	6.74
0.5	0.45	1.39	2.37	3.36	4.35	5.35	6.35	7.34	8.34	9.34
0.75	1.32	2.77	4.11	5.39	6.63	7.84	9.04	10.22	11.39	12.55
0.9	2.71	4.61	6.25	7.78	9.24	10.64	12.02	13.36	14.68	15.99
0.95	3.84	5.99	7.81	9.49	11.07	12.59	14.07	15.51	16.92	18.31
0.975	5.02	7.38	9.35	11.14	12.83	14.45	16.01	17.53	19.02	20.48
0.99	6.63	9.21	11.34	13.28	15.09	16.81	18.48	20.09	21.67	23.21
0.995	7.88	10.60	12.84	14.86	16.75	18.55	20.28	21.96	23.59	25.19
0.999	10.83	13.82	16.27	18.47	20.52	22.46	24.32	26.13	27.88	29.59

$F(x)$	Number of Degrees of Freedom									
	11	12	13	14	15	16	17	18	19	20
0.001	1.83	2.21	2.62	3.04	3.48	3.94	4.42	4.90	5.41	5.92
0.005	2.60	3.07	3.57	4.07	4.60	5.14	5.70	6.26	6.84	7.43
0.01	3.05	3.57	4.11	4.66	5.23	5.81	6.41	7.01	7.63	8.26
0.025	3.82	4.40	5.01	5.63	6.26	6.91	7.56	8.23	8.91	9.59
0.05	4.57	5.23	5.89	6.57	7.26	7.96	8.67	9.39	10.12	10.85
0.1	5.58	6.30	7.04	7.79	8.55	9.31	10.09	10.86	11.65	12.44
0.25	7.58	8.44	9.30	10.17	11.04	11.91	12.79	13.68	14.56	15.45
0.5	10.34	11.34	12.34	13.34	14.34	15.34	16.34	17.34	18.34	19.34
0.75	13.70	14.85	15.98	17.12	18.25	19.37	20.49	21.60	22.72	23.83
0.9	17.28	18.55	19.81	21.06	22.31	23.54	24.77	25.99	27.20	28.41
0.95	19.68	21.03	22.36	23.68	25.00	26.30	27.59	28.87	30.14	31.41
0.975	21.92	23.34	24.74	26.12	27.49	28.85	30.19	31.53	32.85	34.17
0.99	24.73	26.22	27.69	29.14	30.58	32.00	33.41	34.81	36.19	37.57
0.995	26.76	28.30	29.82	31.32	32.80	34.27	35.72	37.16	38.58	40.00
0.999	31.26	32.91	34.53	36.12	37.70	39.25	40.79	42.31	43.82	45.32

Table 6. Values of x for Given Values of the Distribution Function (3) in Sec. 10.1
(Continued)



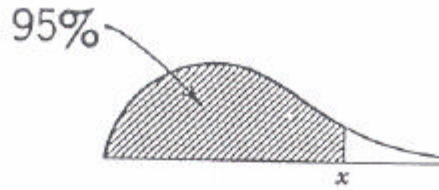
$F(x)$	Number of Degrees of Freedom									
	21	22	23	24	25	26	27	28	29	30
0.001	6.4	7.0	7.5	8.1	8.7	9.2	9.8	10.4	11.0	11.6
0.005	8.0	8.6	9.3	9.9	10.5	11.2	11.8	12.5	13.1	13.8
0.01	8.9	9.5	10.2	10.9	11.5	12.2	12.9	13.6	14.3	15.0
0.025	10.3	11.0	11.7	12.4	13.1	13.8	14.6	15.3	16.0	16.8
0.05	11.6	12.3	13.1	13.8	14.6	15.4	16.2	16.9	17.7	18.5
0.1	13.2	14.0	14.8	15.7	16.5	17.3	18.1	18.9	19.8	20.6
0.25	16.3	17.2	18.1	19.0	19.9	20.8	21.7	22.7	23.6	24.5
0.5	20.3	21.3	22.3	23.3	24.3	25.3	26.3	27.3	28.3	29.3
0.75	24.9	26.0	27.1	28.2	29.3	30.4	31.5	32.6	33.7	34.8
0.9	29.6	30.8	32.0	33.2	34.4	35.6	36.7	37.9	39.1	40.3
0.95	32.7	33.9	35.2	36.4	37.7	38.9	40.1	41.3	42.6	43.8
0.975	35.5	36.8	38.1	39.4	40.6	41.9	43.2	44.5	45.7	47.0
0.99	38.9	40.3	41.6	43.0	44.3	45.6	47.0	48.3	49.6	50.9
0.995	41.4	42.8	44.2	45.6	46.9	48.3	49.6	51.0	52.3	53.7
0.999	46.8	48.3	49.7	51.2	52.6	54.1	55.5	56.9	58.3	59.7

$F(x)$	Number of Degrees of Freedom							
	40	50	60	70	80	90	100	>100 (Approximation)
0.001	17.9	24.7	31.7	39.0	46.5	54.2	61.9	$\frac{1}{2}(h - 3.09)^2$
0.005	20.7	28.0	35.5	43.3	51.2	59.2	67.3	$\frac{1}{2}(h - 2.58)^2$
0.01	22.2	29.7	37.5	45.4	53.5	61.8	70.1	$\frac{1}{2}(h - 2.33)^2$
0.025	24.4	32.4	40.5	48.8	57.2	65.6	74.2	$\frac{1}{2}(h - 1.96)^2$
0.05	26.5	34.8	43.2	51.7	60.4	69.1	77.9	$\frac{1}{2}(h - 1.64)^2$
0.1	29.1	37.7	46.5	55.3	64.3	73.3	82.4	$\frac{1}{2}(h - 1.28)^2$
0.25	33.7	42.9	52.3	61.7	71.1	80.6	90.1	$\frac{1}{2}(h - 0.67)^2$
0.5	39.3	49.3	59.3	69.3	79.3	89.3	99.3	$\frac{1}{2}h^2$
0.75	45.6	56.3	67.0	77.6	88.1	98.6	109.1	$\frac{1}{2}(h + 0.67)^2$
0.9	51.8	63.2	74.4	85.5	96.6	107.6	118.5	$\frac{1}{2}(h + 1.28)^2$
0.95	55.8	67.5	79.1	90.5	101.9	113.1	124.3	$\frac{1}{2}(h + 1.64)^2$
0.975	59.3	71.4	83.3	95.0	106.6	118.1	129.6	$\frac{1}{2}(h + 1.96)^2$
0.99	63.7	76.2	88.4	100.4	112.3	124.1	135.8	$\frac{1}{2}(h + 2.33)^2$
0.995	66.8	79.5	92.0	104.2	116.3	128.3	140.2	$\frac{1}{2}(h + 2.58)^2$
0.999	73.4	86.7	99.6	112.3	124.8	137.2	149.4	$\frac{1}{2}(h + 3.09)^2$

In the last column, $h = \sqrt{2m - 1}$, where m is the number of degrees of freedom.

Table 9a. Values of x for which the Distribution Function (2) in Sec. 13.6 of the F -Distribution with (m, n) Degrees of Freedom has the Value 0.95

More extended tables: Pearson and Hartley (1954), Hald (1962) (cf. Appendix 3).



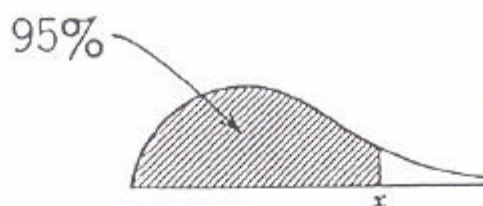
Example. For (7, 4) degrees of freedom, $F = 0.95$ when $x = 6.09$.

The value of x for which $F = 0.05$ in the case (n, m) degrees of freedom equals the reciprocal of that x for which $F = 0.95$ in the case of (m, n) degrees of freedom.

Example. For (7, 4) degrees of freedom, $F = 0.05$ when $x = 1/4.12 = 0.24$.

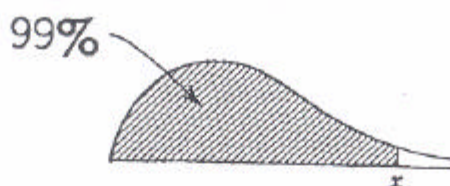
n	$m = 1$	$m = 2$	$m = 3$	$m = 4$	$m = 5$	$m = 6$	$m = 7$	$m = 8$	$m = 9$
1	161	200	216	225	230	234	237	239	241
2	18.5	19.0	19.2	19.2	19.3	19.3	19.4	19.4	19.4
3	10.1	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30
26	4.23	3.37	2.98	2.74	2.59	2.47	2.39	2.32	2.27
28	4.20	3.34	2.95	2.71	2.56	2.45	2.36	2.29	2.24
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21
32	4.15	3.30	2.90	2.67	2.51	2.40	2.31	2.24	2.19
34	4.13	3.28	2.88	2.65	2.49	2.38	2.29	2.23	2.17
36	4.11	3.26	2.87	2.63	2.48	2.36	2.28	2.21	2.15
38	4.10	3.24	2.85	2.62	2.46	2.35	2.26	2.19	2.14
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07
60	4.00	3.15	2.76	2.53	2.37	2.25	2.17	2.10	2.04
70	3.98	3.13	2.74	2.50	2.35	2.23	2.14	2.07	2.02
80	3.96	3.11	2.72	2.49	2.33	2.21	2.13	2.06	2.00
90	3.95	3.10	2.71	2.47	2.32	2.20	2.11	2.04	1.99
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97
150	3.90	3.06	2.66	2.43	2.27	2.16	2.07	2.00	1.94
200	3.89	3.04	2.65	2.42	2.26	2.14	2.06	1.98	1.93
1000	3.85	3.00	2.61	2.38	2.22	2.11	2.02	1.95	1.89
∞	3.84	3.00	2.60	2.37	2.21	2.10	2.01	1.94	1.88

Table 9a. Values of x for which the Distribution Function (2) in Sec. 13.6 of the F -Distribution with (m, n) Degrees of Freedom has the Value 0.95 (Continued)



n	$m = 10$	$m = 15$	$m = 20$	$m = 30$	$m = 40$	$m = 50$	$m = 100$	∞
1	242	246	248	250	251	252	253	254
2	19.4	19.4	19.4	19.5	19.5	19.5	19.5	19.5
3	8.79	8.70	8.66	8.62	8.59	8.58	8.55	8.53
4	5.96	5.86	5.80	5.75	5.72	5.70	5.66	5.63
5	4.74	4.62	4.56	4.50	4.46	4.44	4.41	4.37
6	4.06	3.94	3.87	3.81	3.77	3.75	3.71	3.67
7	3.64	3.51	3.44	3.38	3.34	3.32	3.27	3.23
8	3.35	3.22	3.15	3.08	3.04	3.02	2.97	2.93
9	3.14	3.01	2.94	2.86	2.83	2.80	2.76	2.71
10	2.98	2.85	2.77	2.70	2.66	2.64	2.59	2.54
11	2.85	2.72	2.65	2.57	2.53	2.51	2.46	2.40
12	2.75	2.62	2.54	2.47	2.43	2.40	2.35	2.30
13	2.67	2.53	2.46	2.38	2.34	2.31	2.26	2.21
14	2.60	2.46	2.39	2.31	2.27	2.24	2.19	2.13
15	2.54	2.40	2.33	2.25	2.20	2.18	2.12	2.07
16	2.49	2.35	2.28	2.19	2.15	2.12	2.07	2.01
17	2.45	2.31	2.23	2.15	2.10	2.08	2.02	1.96
18	2.41	2.27	2.19	2.11	2.06	2.04	1.98	1.92
19	2.38	2.23	2.16	2.07	2.03	2.00	1.94	1.88
20	2.35	2.20	2.12	2.04	1.99	1.97	1.91	1.84
22	2.30	2.15	2.07	1.98	1.94	1.91	1.85	1.78
24	2.25	2.11	2.03	1.94	1.89	1.86	1.80	1.73
26	2.22	2.07	1.99	1.90	1.85	1.82	1.76	1.69
28	2.19	2.04	1.96	1.87	1.82	1.79	1.73	1.65
30	2.16	2.01	1.93	1.84	1.79	1.76	1.70	1.62
32	2.14	1.99	1.91	1.82	1.77	1.74	1.67	1.59
34	2.12	1.97	1.89	1.80	1.75	1.71	1.65	1.57
36	2.11	1.95	1.87	1.78	1.73	1.69	1.62	1.55
38	2.09	1.94	1.85	1.76	1.71	1.68	1.61	1.53
40	2.08	1.92	1.84	1.74	1.69	1.66	1.59	1.51
50	2.03	1.87	1.78	1.69	1.63	1.60	1.52	1.44
60	1.99	1.84	1.75	1.65	1.59	1.56	1.48	1.39
70	1.97	1.81	1.72	1.62	1.57	1.53	1.45	1.35
80	1.95	1.79	1.70	1.60	1.54	1.51	1.43	1.32
90	1.94	1.78	1.69	1.59	1.53	1.49	1.41	1.30
100	1.93	1.77	1.68	1.57	1.52	1.48	1.39	1.28
150	1.89	1.73	1.64	1.53	1.48	1.44	1.34	1.22
200	1.88	1.72	1.62	1.52	1.46	1.41	1.32	1.19
1000	1.84	1.68	1.58	1.47	1.41	1.36	1.26	1.08
∞	1.83	1.67	1.57	1.46	1.39	1.35	1.24	1.00

Table 9b. Values of x for which the Distribution Function (2) in Sec. 13.6 of the F -Distribution with (m, n) Degrees of Freedom has the Value 0.99



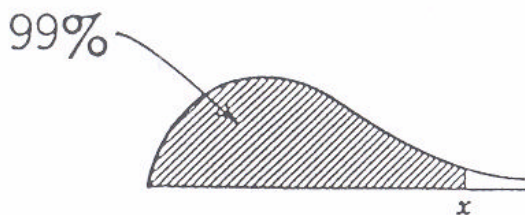
Example. For $(7, 4)$ degrees of freedom, $F = 0.99$ when $x = 15.0$.

The value of x for which $F = 0.01$ in the case of (n, m) degrees of freedom equals the reciprocal of that x for which $F = 0.99$ in the case of $F(m, n)$ degrees of freedom.

Example. For $(7, 4)$ degrees of freedom, $F = 0.01$ when $x = 1/7.85 = 0.13$.

n	$m = 1$	$m = 2$	$m = 3$	$m = 4$	$m = 5$	$m = 6$	$m = 7$	$m = 8$	$m = 9$
1	4052	4999	5403	5625	5764	5859	5928	5982	6022
2	98.5	99.0	99.2	99.3	99.3	99.3	99.4	99.4	99.4
3	34.1	30.8	29.5	28.7	28.2	27.9	27.7	27.5	27.3
4	21.2	18.0	16.7	16.0	15.5	15.2	15.0	14.8	14.7
5	16.3	13.3	12.1	11.4	11.0	10.7	10.5	10.3	10.2
6	13.7	10.9	9.78	9.15	8.75	8.47	8.26	8.10	7.98
7	12.2	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72
8	11.3	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91
9	10.6	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35
10	10.0	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19
14	8.86	6.51	5.56	5.04	4.70	4.46	4.28	4.14	4.03
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26
26	7.72	5.53	4.64	4.14	3.82	3.59	3.42	3.29	3.18
28	7.64	5.45	4.57	4.07	3.75	3.53	3.36	3.23	3.12
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07
32	7.50	5.34	4.46	3.97	3.65	3.43	3.26	3.13	3.02
34	7.44	5.29	4.42	3.93	3.61	3.39	3.22	3.09	2.98
36	7.40	5.25	4.38	3.89	3.57	3.35	3.18	3.05	2.95
38	7.35	5.21	4.34	3.86	3.54	3.32	3.15	3.02	2.92
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89
50	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.79
60	7.08	4.98	4.13	3.65	3.34	3.12	2.95	2.82	2.72
70	7.01	4.92	4.08	3.60	3.29	3.07	2.91	2.78	2.67
80	6.96	4.88	4.04	3.56	3.26	3.04	2.87	2.74	2.64
90	6.93	4.85	4.01	3.54	3.23	3.01	2.84	2.72	2.61
100	6.90	4.82	3.98	3.51	3.21	2.99	2.82	2.69	2.59
150	6.81	4.75	3.92	3.45	3.14	2.92	2.76	2.63	2.53
200	6.76	4.71	3.88	3.41	3.11	2.89	2.73	2.60	2.50
1000	6.66	4.63	3.80	3.34	3.04	2.82	2.66	2.53	2.43
∞	6.63	4.61	3.78	3.32	3.02	2.80	2.64	2.51	2.41

Table 9b. Values of x for which the Distribution Function (2) in Sec. 13.6 of the F -Distribution with (m, n) Degrees of Freedom has the Value 0.99 (Continued)



n	$m = 10$	$m = 15$	$m = 20$	$m = 30$	$m = 40$	$m = 50$	$m = 100$	∞
1	6056	6157	6209	6261	6287	6300	6330	6366
2	99.4	99.4	99.4	99.5	99.5	99.5	99.5	99.5
3	27.2	26.9	26.7	26.5	26.4	26.4	26.2	26.1
4	14.5	14.2	14.0	13.8	13.7	13.7	13.6	13.5
5	10.1	9.72	9.55	9.38	9.29	9.24	9.13	9.02
6	7.87	7.56	7.40	7.23	7.14	7.09	6.99	6.88
7	6.62	6.31	6.16	5.99	5.91	5.86	5.75	5.65
8	5.81	5.52	5.36	5.20	5.12	5.07	4.96	4.86
9	5.26	4.96	4.81	4.65	4.57	4.52	4.42	4.31
10	4.85	4.56	4.41	4.25	4.17	4.12	4.01	3.91
11	4.54	4.25	4.10	3.94	3.86	3.81	3.71	3.60
12	4.30	4.01	3.86	3.70	3.62	3.57	3.47	3.36
13	4.10	3.82	3.66	3.51	3.43	3.38	3.27	3.17
14	3.94	3.66	3.51	3.35	3.27	3.22	3.11	3.00
15	3.80	3.52	3.37	3.21	3.13	3.08	2.98	2.87
16	3.69	3.41	3.26	3.10	3.02	2.97	2.86	2.75
17	3.59	3.31	3.16	3.00	2.92	2.87	2.76	2.65
18	3.51	3.23	3.08	2.92	2.84	2.78	2.68	2.57
19	3.43	3.15	3.00	2.84	2.76	2.71	2.60	2.49
20	3.37	3.09	2.94	2.78	2.69	2.64	2.54	2.42
22	3.26	2.98	2.83	2.67	2.58	2.53	2.42	2.31
24	3.17	2.89	2.74	2.58	2.49	2.44	2.33	2.21
26	3.09	2.82	2.66	2.50	2.42	2.36	2.25	2.13
28	3.03	2.75	2.60	2.44	2.35	2.30	2.19	2.06
30	2.98	2.70	2.55	2.39	2.30	2.25	2.13	2.01
32	2.93	2.66	2.50	2.34	2.25	2.20	2.08	1.96
34	2.89	2.62	2.46	2.30	2.21	2.16	2.04	1.91
36	2.86	2.58	2.43	2.26	2.17	2.12	2.00	1.87
38	2.83	2.55	2.40	2.23	2.14	2.09	1.97	1.84
40	2.80	2.52	2.37	2.20	2.11	2.06	1.94	1.80
50	2.70	2.42	2.27	2.10	2.01	1.95	1.82	1.68
60	2.63	2.35	2.20	2.03	1.94	1.88	1.75	1.60
70	2.59	2.31	2.15	1.98	1.89	1.83	1.70	1.54
80	2.55	2.27	2.12	1.94	1.85	1.79	1.66	1.49
90	2.52	2.24	2.09	1.92	1.82	1.76	1.62	1.46
100	2.50	2.22	2.07	1.89	1.80	1.73	1.60	1.43
150	2.44	2.16	2.00	1.83	1.73	1.66	1.52	1.33
200	2.41	2.13	1.97	1.79	1.69	1.63	1.48	1.28
1000	2.34	2.06	1.90	1.72	1.61	1.54	1.38	1.11
∞	2.32	2.04	1.88	1.70	1.59	1.52	1.36	1.00