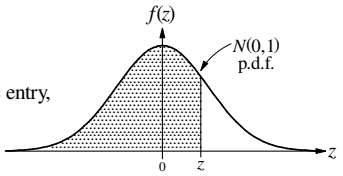
University of Waterloo W. H. Cherry

PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION [$N(0,1)$]

IN THE MAIN UPPER TABLE:

Pr[$-\infty < N(0,1) \le z$-value from table margins] = Table entry,

e.g., Pr[$-\infty < N(0,1) \le 0.00$] = $0.5000^{00} = 0.5$;



Notation:

$F(0.01) = .5040^{-11} = 0.503\,989$

$F(0.05) = .5199^{39} = 0.519\,939$

$F(2.33) = .9^20097 = 0.990\,097$,

where $F(z)$ is the $N(0,1)$ c.d.f.:

$$F(z) = \int_{-\infty}^{z} f(t)\,dt = \int_{-\infty}^{z} \frac{1}{\sqrt{2\pi}} e^{-\frac{1}{2}t^2}\,dt.$$

THE SMALLER LOWER TABLE provides more accurate and convenient inverse lookup for selected probabilities in the interval 0.5 to 0.999 9995.

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	$.5000^{00}$	$.5040^{-11}$	$.5080^{-22}$	$.5120^{-34}$	$.5160^{-47}$	$.5199^{39}$	$.5239^{22}$	$.5279^{03}$	$.5319^{-19}$	$.5359^{-44}$
0.1	$.5398^{28}$	$.5438^{-05}$	$.5478^{-42}$	$.5517^{17}$	$.5557^{-30}$	$.5596^{18}$	$.5636^{-41}$	$.5675^{-05}$	$.5714^{24}$	$.5753^{45}$
0.2	$.5793^{-40}$	$.5832^{-34}$	$.5871^{-36}$	$.5910^{-46}$	$.5948^{35}$	$.5987^{06}$	$.6026^{-32}$	$.6064^{20}$	$.6103^{-39}$	$.6141^{-08}$
0.3	$.6179^{11}$	$.6217^{20}$	$.6255^{16}$	$.6293^{00}$	$.6331^{-28}$	$.6368^{31}$	$.6406^{-24}$	$.6443^{09}$	$.6480^{27}$	$.6517^{32}$
0.4	$.6554^{22}$	$.6591^{-03}$	$.6628^{-43}$	$.6664^{02}$	$.6700^{31}$	$.6736^{45}$	$.6772^{42}$	$.6808^{22}$	$.6844^{-14}$	$.6879^{33}$
0.5	$.6915^{-38}$	$.6950^{-26}$	$.6985^{-32}$	$.7019^{44}$	$.7054^{01}$	$.7088^{40}$	$.7123^{-40}$	$.7157^{-39}$	$.7190^{43}$	$.7224^{05}$
0.6	$.7257^{47}$	$.7291^{-31}$	$.7324^{-29}$	$.7357^{-47}$	$.7389^{14}$	$.7422^{-46}$	$.7454^{-27}$	$.7486^{-29}$	$.7517^{48}$	$.7549^{03}$
0.7	$.7580^{36}$	$.7611^{48}$	$.7642^{38}$	$.7673^{05}$	$.7704^{-50}$	$.7734^{-27}$	$.7764^{-27}$	$.7794^{-50}$	$.7823^{05}$	$.7852^{36}$
0.8	$.7881^{45}$	$.7910^{30}$	$.7939^{-08}$	$.7967^{31}$	$.7995^{46}$	$.8023^{37}$	$.8051^{05}$	$.8078^{50}$	$.8106^{-30}$	$.8133^{-33}$
0.9	$.8159^{40}$	$.8186^{-11}$	$.8212^{14}$	$.8238^{14}$	$.8264^{-09}$	$.8289^{44}$	$.8315^{-28}$	$.8340^{-23}$	$.8365^{-43}$	$.8389^{13}$
1.0	$.8413^{45}$	$.8438^{-48}$	$.8461^{36}$	$.8485^{-05}$	$.8508^{30}$	$.8531^{41}$	$.8554^{28}$	$.8577^{-10}$	$.8599^{29}$	$.8621^{43}$
1.1	$.8643^{34}$	$.8665^{00}$	$.8686^{43}$	$.8708^{-38}$	$.8729^{-43}$	$.8749^{28}$	$.8770^{-24}$	$.8790^{00}$	$.8810^{00}$	$.8830^{-23}$
1.2	$.8849^{30}$	$.8869^{-39}$	$.8888^{-32}$	$.8907^{-49}$	$.8925^{12}$	$.8944^{-50}$	$.8962^{-35}$	$.8980^{-42}$	$.8997^{27}$	$.9015^{-25}$
1.3	$.9032^{00}$	$.9049^{02}$	$.9066^{-18}$	$.9082^{41}$	$.9099^{-23}$	$.9115^{-08}$	$.9131^{-15}$	$.9147^{-43}$	$.9162^{07}$	$.9177^{36}$
1.4	$.9192^{43}$	$.9207^{30}$	$.9222^{-04}$	$.9236^{41}$	$.9251^{-34}$	$.9265^{-29}$	$.9279^{-45}$	$.9292^{19}$	$.9306^{-37}$	$.9319^{-12}$
1.5	$.9332^{-07}$	$.9345^{-22}$	$.9357^{45}$	$.9370^{-08}$	$.9382^{20}$	$.9394^{29}$	$.9406^{20}$	$.9418^{-08}$	$.9429^{47}$	$.9441^{-17}$
1.6	$.9452^{01}$	$.9463^{01}$	$.9474^{-16}$	$.9484^{49}$	$.9495^{-03}$	$.9505^{29}$	$.9515^{43}$	$.9525^{40}$	$.9535^{21}$	$.9545^{-14}$
1.7	$.9554^{35}$	$.9564^{-33}$	$.9573^{-16}$	$.9582^{-15}$	$.9591^{-30}$	$.9599^{41}$	$.9608^{-04}$	$.9616^{36}$	$.9625^{-38}$	$.9633^{-27}$
1.8	$.9641^{-30}$	$.9649^{-48}$	$.9656^{20}$	$.9664^{-25}$	$.9671^{16}$	$.9678^{43}$	$.9686^{-43}$	$.9693^{-42}$	$.9699^{46}$	$.9706^{21}$
1.9	$.9713^{-17}$	$.9719^{33}$	$.9726^{-29}$	$.9732^{-03}$	$.9738^{10}$	$.9744^{12}$	$.9750^{02}$	$.9756^{-19}$	$.9761^{48}$	$.9767^{05}$
2.0	$.9772^{50}$	$.9778^{-16}$	$.9783^{08}$	$.9788^{22}$	$.9793^{25}$	$.9798^{18}$	$.9803^{01}$	$.9808^{-26}$	$.9812^{37}$	$.9817^{-09}$
2.1	$.9821^{36}$	$.9826^{-29}$	$.9830^{-03}$	$.9834^{14}$	$.9838^{23}$	$.9842^{22}$	$.9846^{14}$	$.9850^{-03}$	$.9854^{-29}$	$.9857^{38}$
2.2	$.9861^{-03}$	$.9864^{47}$	$.9868^{-09}$	$.9871^{26}$	$.9875^{-45}$	$.9878^{-24}$	$.9881^{-11}$	$.9884^{-04}$	$.9887^{-04}$	$.9890^{-11}$
2.3	$.9893^{-24}$	$.9896^{-44}$	$.9898^{30}$	$.9^20097$	$.9^20358$	$.9^20613$	$.9^20863$	$.9^21106$	$.9^21344$	$.9^21576$
2.4	$.9^21802$	$.9^22024$	$.9^22240$	$.9^22451$	$.9^22656$	$.9^22857$	$.9^23053$	$.9^23244$	$.9^23431$	$.9^23613$
2.5	$.9^23790$	$.9^23963$	$.9^24132$	$.9^24297$	$.9^24457$	$.9^24614$	$.9^24766$	$.9^24915$	$.9^25060$	$.9^25201$
2.6	$.9^25339$	$.9^25473$	$.9^25604$	$.9^25731$	$.9^25855$	$.9^25975$	$.9^26093$	$.9^26207$	$.9^26319$	$.9^26427$
2.7	$.9^26533$	$.9^26636$	$.9^26736$	$.9^26833$	$.9^26928$	$.9^27020$	$.9^27110$	$.9^27197$	$.9^27282$	$.9^27365$
2.8	$.9^27445$	$.9^27523$	$.9^27599$	$.9^27673$	$.9^27744$	$.9^27814$	$.9^27882$	$.9^27948$	$.9^28012$	$.9^28074$
2.9	$.9^28134$	$.9^28193$	$.9^28250$	$.9^28305$	$.9^28359$	$.9^28411$	$.9^28462$	$.9^28511$	$.9^28559$	$.9^28605$
3.0	$.9^28650$	$.9^28694$	$.9^28736$	$.9^28777$	$.9^28817$	$.9^28856$	$.9^28893$	$.9^28930$	$.9^28965$	$.9^28999$
3.1	$.9^30324$	$.9^30646$	$.9^30957$	$.9^31260$	$.9^31553$	$.9^31836$	$.9^32112$	$.9^32378$	$.9^32636$	$.9^32886$
3.2	$.9^33129$	$.9^33363$	$.9^33590$	$.9^33810$	$.9^34024$	$.9^34230$	$.9^34429$	$.9^34623$	$.9^34810$	$.9^34991$
3.3	$.9^35166$	$.9^35335$	$.9^35499$	$.9^35658$	$.9^35811$	$.9^35959$	$.9^36103$	$.9^36242$	$.9^36376$	$.9^36505$
3.4	$.9^36631$	$.9^36752$	$.9^36869$	$.9^36982$	$.9^37091$	$.9^37197$	$.9^37299$	$.9^37398$	$.9^37493$	$.9^37585$
3.5	$.9^37674$	$.9^37759$	$.9^37842$	$.9^37922$	$.9^37999$	$.9^38074$	$.9^38146$	$.9^38215$	$.9^38282$	$.9^38347$
3.6	$.9^38409$	$.9^38469$	$.9^38527$	$.9^38583$	$.9^38637$	$.9^38689$	$.9^38739$	$.9^38787$	$.9^38834$	$.9^38879$
3.7	$.9^38922$	$.9^38964$	$.9^40039$	$.9^40426$	$.9^40799$	$.9^41158$	$.9^41504$	$.9^41838$	$.9^42159$	$.9^42468$
3.8	$.9^42765$	$.9^43052$	$.9^43327$	$.9^43593$	$.9^43848$	$.9^44094$	$.9^44331$	$.9^44558$	$.9^44777$	$.9^44988$
3.9	$.9^45190$	$.9^45385$	$.9^45573$	$.9^45753$	$.9^45926$	$.9^46092$	$.9^46253$	$.9^46406$	$.9^46554$	$.9^46696$
4.0	$.9^46833$	$.9^46964$	$.9^47090$	$.9^47211$	$.9^47327$	$.9^47439$	$.9^47546$	$.9^47649$	$.9^47748$	$.9^47843$
5	$.9^67134$									
6	$.9^90134$									
7	$.9^{11}8720$									
8	$.9^{15}3779$									
9	$.9^{18}8872$									
10	$.9^{23}2380$									
12	$.9^{32}8224$									
14	$.9^{44}2207$									
16	$.9^{57}3611$									
18	$.9^{72}0259$									
20	$.9^{88}7246$									
25	$.9^{137}6943$									
30	$.9^{197}5093$									
40	$.9^{349}6344$									
50	$.9^{544}8919$									
60	$.9^{783}8762$									
70	$.9^{1066}4577$									
80	$.9^{1392}0976$									
100	$.9^{2173}8656$									

N_{46} right half

INVERSE $N(0,1)$ C.d.f., giving z for a specified $F(z) \ge 0.5$

.50	0	.60	.253 347	.70	.524 401	.80	.841 621	.90	1.281 552	.990	2.326 348
.51	.0250 689	.61	.279 319	.71	.553 385	.81	.877 896	.91	1.340 755	.991	2.365 618
.52	.0501 536	.62	.305 481	.72	.582 842	.82	.915 365	.92	1.405 072	.992	2.408 916
.53	.0752 699	.63	.331 853	.73	.612 813	.83	.954 165	.93	1.475 791	.993	2.457 263
.54	.100 434	.64	.358 459	.74	.643 345	.84	.994 458	.94	1.554 774	.994	2.512 144
.55	.125 661	.65	.385 320	.75	.674 490	.85	1.036 433	.95	1.644 854	.995	2.575 829
.56	.150 969	.66	.412 463	.76	.706 303	.86	1.080 319	.96	1.750 686	.996	2.652 070
.57	.176 374	.67	.439 913	.77	.738 847	.87	1.126 391	.97	1.880 794	.997	2.747 781
.58	.201 893	.68	.467 699	.78	.772 193	.88	1.174 987	.975	1.959 964	.998	2.878 162
.59	.227 545	.69	.495 850	.79	.806 421	.89	1.226 528	.98	2.053 749	.999	3.090 232
										$.9^35$	3.290 527
										$.9^45$	3.890 592
										$.9^55$	4.417 173
										$.9^65$	4.891 638

Most table entries were obtained from *pnorm* or *qnorm* in R version 2.14.0

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PROBABILITIES FOR THE STANDARD NORMAL DISTRIBUTION [$N(0,1)$]

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N left half

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.8	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
−3.7	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
−3.6	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
−3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.3	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
−3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
−2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
−2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
−2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
−2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
−2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
−2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
−2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
−2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
−2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
−2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
−1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
−1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
−1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
−1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
−1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
−1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
−1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
−1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
−1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
−1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
−0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
−0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
−0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
−0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
−0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
−0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
−0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
−0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
−0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
−0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

N right half

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998
3.5	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998	.9998
3.6	.9998	.9998	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
3.7	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
3.8	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999	.9999
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09

2004-06-20

REFERENCE: Abramowitz, M. and I.A. Stegun. *Handbook of Mathematical Functions.* Dover Publications, Inc., New York, Ninth Printing, 1970, pages 966-973.