

NEGATIVE z Scores

Table 2 Standard Normal (z) Distribution: Cumulative Area from the LEFT

z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.50 and lower	.0001	.0003	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0019
-3.4	.0003	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0021
-3.3	.0005	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0021	.0023
-3.2	.0007	.0009	.0011	.0013	.0015	.0017	.0019	.0021	.0023	.0025
-3.1	.0009	.0011	.0013	.0015	.0017	.0019	.0021	.0023	.0025	.0027
-3.0	.0011	.0013	.0015	.0017	.0019	.0021	.0023	.0025	.0027	.0029
-2.9	.0013	.0015	.0017	.0019	.0021	.0023	.0025	.0027	.0029	.0031
-2.8	.0015	.0017	.0019	.0021	.0023	.0025	.0027	.0029	.0031	.0033
-2.7	.0017	.0019	.0021	.0023	.0025	.0027	.0029	.0031	.0033	.0035
-2.6	.0019	.0021	.0023	.0025	.0027	.0029	.0031	.0033	.0035	.0037
-2.5	.0021	.0023	.0025	.0027	.0029	.0031	.0033	.0035	.0037	.0039
-2.4	.0023	.0025	.0027	.0029	.0031	.0033	.0035	.0037	.0039	.0041
-2.3	.0025	.0027	.0029	.0031	.0033	.0035	.0037	.0039	.0041	.0043
-2.2	.0027	.0029	.0031	.0033	.0035	.0037	.0039	.0041	.0043	.0045
-2.1	.0029	.0031	.0033	.0035	.0037	.0039	.0041	.0043	.0045	.0047
-2.0	.0031	.0033	.0035	.0037	.0039	.0041	.0043	.0045	.0047	.0049
-1.9	.0033	.0035	.0037	.0039	.0041	.0043	.0045	.0047	.0049	.0051
-1.8	.0035	.0037	.0039	.0041	.0043	.0045	.0047	.0049	.0051	.0053
-1.7	.0037	.0039	.0041	.0043	.0045	.0047	.0049	.0051	.0053	.0055
-1.6	.0039	.0041	.0043	.0045	.0047	.0049	.0051	.0053	.0055	.0057
-1.5	.0041	.0043	.0045	.0047	.0049	.0051	.0053	.0055	.0057	.0059
-1.4	.0043	.0045	.0047	.0049	.0051	.0053	.0055	.0057	.0059	.0061
-1.3	.0045	.0047	.0049	.0051	.0053	.0055	.0057	.0059	.0061	.0063
-1.2	.0047	.0049	.0051	.0053	.0055	.0057	.0059	.0061	.0063	.0065
-1.1	.0049	.0051	.0053	.0055	.0057	.0059	.0061	.0063	.0065	.0067
-1.0	.0051	.0053	.0055	.0057	.0059	.0061	.0063	.0065	.0067	.0069
-0.9	.0053	.0055	.0057	.0059	.0061	.0063	.0065	.0067	.0069	.0071
-0.8	.0055	.0057	.0059	.0061	.0063	.0065	.0067	.0069	.0071	.0073
-0.7	.0057	.0059	.0061	.0063	.0065	.0067	.0069	.0071	.0073	.0075
-0.6	.0059	.0061	.0063	.0065	.0067	.0069	.0071	.0073	.0075	.0077
-0.5	.0061	.0063	.0065	.0067	.0069	.0071	.0073	.0075	.0077	.0079
-0.4	.0063	.0065	.0067	.0069	.0071	.0073	.0075	.0077	.0079	.0081
-0.3	.0065	.0067	.0069	.0071	.0073	.0075	.0077	.0079	.0081	.0083
-0.2	.0067	.0069	.0071	.0073	.0075	.0077	.0079	.0081	.0083	.0085
-0.1	.0069	.0071	.0073	.0075	.0077	.0079	.0081	.0083	.0085	.0087
-0.0	.0071	.0073	.0075	.0077	.0079	.0081	.0083	.0085	.0087	.0089

NOTE: For values of z below 3.49, use 0.0001 for the area.

*Use these common values that result from interpolation:

z Score	Area
-1.645	0.0500
-2.575	0.0050

POSITIVE z Scores

Table 2 (continued) Cumulative Area from the LEFT

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	.8889	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9063	.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	.9655	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9725	.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
3.50 and up	.9999									

NOTE: For values of z above 3.49, use 0.9999 for the area.

*Use these common values that result from interpolation:

z Score	Area
1.645	0.9500
2.575	0.9950

Common Critical Values

Confidence Level	Critical Value
0.90	1.645
0.95	1.96
0.99	2.575

Table 3 *t* Distribution: Critical *t* Values

Degrees of Freedom	Area in One Tail				Area in Two Tails		C.05		C.10		C.20	
	0.005	0.01	0.02	0.025	0.05	0.10	0.05	0.10	0.05	0.10	0.05	0.10
1	63.657	31.821	12.706	12.706	6.314	3.078	6.314	3.078	6.314	3.078	6.314	3.078
2	9.925	6.965	4.303	4.303	2.920	1.886	2.920	1.886	2.920	1.886	2.920	1.886
3	5.841	4.541	3.182	3.182	2.353	1.638	2.353	1.638	2.353	1.638	2.353	1.638
4	4.804	3.747	2.776	2.776	2.132	1.533	2.132	1.533	2.132	1.533	2.132	1.533
5	4.032	3.365	2.571	2.571	2.015	1.476	2.015	1.476	2.015	1.476	2.015	1.476
6	3.707	3.143	2.447	2.447	1.943	1.440	1.943	1.440	1.943	1.440	1.943	1.440
7	3.499	2.988	2.365	2.365	1.895	1.415	1.895	1.415	1.895	1.415	1.895	1.415
8	3.355	2.899	2.306	2.306	1.860	1.397	1.860	1.397	1.860	1.397	1.860	1.397
9	3.250	2.821	2.262	2.262	1.833	1.383	1.833	1.383	1.833	1.383	1.833	1.383
10	3.169	2.764	2.228	2.228	1.812	1.372	1.812	1.372	1.812	1.372	1.812	1.372
11	3.106	2.718	2.201	2.201	1.796	1.363	1.796	1.363	1.796	1.363	1.796	1.363
12	3.055	2.681	2.179	2.179	1.782	1.356	1.782	1.356	1.782	1.356	1.782	1.356
13	3.012	2.650	2.160	2.160	1.771	1.350	1.771	1.350	1.771	1.350	1.771	1.350
14	2.977	2.624	2.145	2.145	1.761	1.346	1.761	1.346	1.761	1.346	1.761	1.346
15	2.947	2.602	2.131	2.131	1.753	1.341	1.753	1.341	1.753	1.341	1.753	1.341
16	2.921	2.583	2.120	2.120	1.746	1.337	1.746	1.337	1.746	1.337	1.746	1.337
17	2.896	2.567	2.110	2.110	1.740	1.333	1.740	1.333	1.740	1.333	1.740	1.333
18	2.876	2.552	2.101	2.101	1.734	1.330	1.734	1.330	1.734	1.330	1.734	1.330
19	2.861	2.539	2.093	2.093	1.729	1.326	1.729	1.326	1.729	1.326	1.729	1.326
20	2.846	2.528	2.086	2.086	1.725	1.325	1.725	1.325	1.725	1.325	1.725	1.325
21	2.831	2.518	2.080	2.080	1.721	1.323	1.721	1.323	1.721	1.323	1.721	1.323
22	2.819	2.508	2.074	2.074	1.717	1.321	1.717	1.321	1.717	1.321	1.717	1.321
23	2.807	2.500	2.069	2.069	1.714	1.319	1.714	1.319	1.714	1.319	1.714	1.319
24	2.797	2.492	2.064	2.064	1.711	1.316	1.711	1.316	1.711	1.316	1.711	1.316
25	2.787	2.485	2.060	2.060	1.708	1.316	1.708	1.316	1.708	1.316	1.708	1.316
26	2.779	2.479	2.056	2.056	1.706	1.315	1.706	1.315	1.706	1.315	1.706	1.315
27	2.771	2.473	2.052	2.052	1.703	1.314	1.703	1.314	1.703	1.314	1.703	1.314
28	2.765	2.467	2.048	2.048	1.701	1.313	1.701	1.313	1.701	1.313	1.701	1.313
29	2.756	2.462	2.045	2.045	1.699	1.311	1.699	1.311	1.699	1.311	1.699	1.311
30	2.750	2.457	2.042	2.042	1.697	1.310	1.697	1.310	1.697	1.310	1.697	1.310
31	2.744	2.453	2.040	2.040	1.696	1.309	1.696	1.309	1.696	1.309	1.696	1.309
32	2.738	2.449	2.037	2.037	1.694	1.309	1.694	1.309	1.694	1.309	1.694	1.309
33	2.733	2.445	2.035	2.035	1.692	1.308	1.692	1.308	1.692	1.308	1.692	1.308
34	2.728	2.441	2.032	2.032	1.691	1.307	1.691	1.307	1.691	1.307	1.691	1.307
35	2.724	2.438	2.030	2.030	1.690	1.306	1.690	1.306	1.690	1.306	1.690	1.306
36	2.719	2.434	2.028	2.028	1.688	1.306	1.688	1.306	1.688	1.306	1.688	1.306
37	2.716	2.431	2.026	2.026	1.687	1.305	1.687	1.305	1.687	1.305	1.687	1.305
38	2.712	2.429	2.024	2.024	1.686	1.304	1.686	1.304	1.686	1.304	1.686	1.304
39	2.708	2.425	2.023	2.023	1.685	1.304	1.685	1.304	1.685	1.304	1.685	1.304
40	2.704	2.423	2.021	2.021	1.684	1.303	1.684	1.303	1.684	1.303	1.684	1.303
41	2.699	2.421	2.019	2.019	1.683	1.303	1.683	1.303	1.683	1.303	1.683	1.303
42	2.696	2.419	2.018	2.018	1.682	1.302	1.682	1.302	1.682	1.302	1.682	1.302
43	2.693	2.417	2.017	2.017	1.681	1.302	1.681	1.302	1.681	1.302	1.681	1.302
44	2.690	2.415	2.016	2.016	1.680	1.301	1.680	1.301	1.680	1.301	1.680	1.301
45	2.687	2.413	2.015	2.015	1.679	1.301	1.679	1.301	1.679	1.301	1.679	1.301
46	2.684	2.411	2.014	2.014	1.678	1.300	1.678	1.300	1.678	1.300	1.678	1.300
47	2.681	2.409	2.013	2.013	1.677	1.299	1.677	1.299	1.677	1.299	1.677	1.299
48	2.678	2.407	2.012	2.012	1.676	1.299	1.676	1.299	1.676	1.299	1.676	1.299
49	2.675	2.405	2.011	2.011	1.675	1.298	1.675	1.298	1.675	1.298	1.675	1.298
50	2.672	2.403	2.010	2.010	1.674	1.298	1.674	1.298	1.674	1.298	1.674	1.298
51	2.669	2.401	2.009	2.009	1.673	1.297	1.673	1.297	1.673	1.297	1.673	1.297
52	2.666	2.399	2.008	2.008	1.672	1.297	1.672	1.297	1.672	1.297	1.672	1.297
53	2.663	2.397	2.007	2.007	1.671	1.296	1.671	1.296	1.671	1.296	1.671	1.296
54	2.660	2.395	2.006	2.006	1.670	1.296	1.670	1.296	1.670	1.296	1.670	1.296
55	2.657	2.393	2.005	2.005	1.669	1.295	1.669	1.295	1.669	1.295	1.669	1.295
56	2.654	2.391	2.004	2.004	1.668	1.295	1.668	1.295	1.668	1.295	1.668	1.295
57	2.651	2.389	2.003	2.003	1.667	1.294	1.667	1.294	1.667	1.294	1.667	1.294
58	2.648	2.387	2.002	2.002	1.666	1.294	1.666	1.294	1.666	1.294	1.666	1.294
59	2.645	2.385	2.001	2.001	1.665	1.293	1.665	1.293	1.665	1.293	1.665	1.293
60	2.642	2.383	2.000	2.000	1.664	1.293	1.664	1.293	1.664	1.293	1.664	1.293
61	2.639	2.381	1.999	1.999	1.663	1.292	1.663	1.292	1.663	1.292	1.663	1.292
62	2.636	2.379	1.998	1.998	1.662	1.292	1.662	1.292	1.662	1.292	1.662	1.292
63	2.633	2.377	1.997	1.997	1.661	1.291	1.661	1.291	1.661	1.291	1.661	1.291
64	2.630	2.375	1.996	1.996	1.660	1.291	1.660	1.291	1.660	1.291	1.660	1.291
65	2.627	2.373	1.995	1.995	1.659	1.290	1.659	1.290	1.659	1.290	1.659	1.290
66	2.624	2.371	1.994	1.994	1.658	1.290	1.658	1.290	1.658	1.290	1.658	1.290
67	2.621	2.369	1.993	1.993	1.657	1.289	1.657	1.289	1.657	1.289	1.657	1.289
68	2.618	2.367	1.992	1.992	1.656	1.289	1.656	1.289	1.656	1.289	1.656	1.289
69	2.615	2.365	1.991	1.991	1.655	1.288	1.655	1.288	1.655	1.288	1.655	1.288
70	2.612	2.363	1.990	1.990	1.654	1.288	1.654	1.288	1.654	1.288	1.654	1.288
71	2.609	2.361	1.989	1.989	1.653	1.287	1.653	1.287	1.653	1.287	1.653	1.287
72	2.606	2.359	1.988	1.988	1.652	1.287	1.652	1.287	1.652	1.287	1.652	1.287
73	2.603	2.357	1.987	1.987	1.651	1.286	1.651	1.286	1.651	1.286	1.651	1.286
74	2.600	2.355	1.986	1.986	1.650	1.286	1.650	1.286	1.650	1.286	1.650	1.286
75	2.597	2.353	1.985	1.985	1.649	1.285	1.649	1.285	1.649	1.285	1.649	1.285
76	2.594	2.351	1.984	1.984	1.648	1.285	1.648	1.285	1.648	1.285	1.648	1.285
77	2.591	2.349	1.983	1.983	1.647	1.284	1.647	1.284	1.647	1.284	1.647	1.284
78	2.588	2.347	1.982	1.982	1.646	1.284	1.646	1.284	1.646	1.284	1.646	1.284
79	2.585	2.345	1.981	1.981	1.645	1.283	1.645	1.283	1.645	1.283	1.645	1.283
80	2.582	2.343	1.980	1.980	1.644	1.283	1.644	1.283	1.644	1.283	1.644	1.283
81	2.579	2.341	1.979	1.979	1.643	1.282	1.643	1.282	1.643	1.282	1.643	1.282
82	2.576	2.339	1.978	1.978	1.642	1.282	1.642	1.282	1.642	1.282	1.642	1.282
83	2.573	2.337	1.977	1.977	1.641	1.281	1.641	1.281	1.641	1.281	1.641	1.281
84	2.570	2.335	1.976	1.976	1.640	1.281	1.640	1.281	1.640	1.281	1.640	1.281
85	2.567	2.333	1.975	1.975	1.639	1.280	1.639	1.280	1.639	1.280	1.639	1.280
86	2.564	2.331	1.974	1.974	1.638	1.280	1.638	1.280	1.638	1.280	1.638	1.280
87	2.561	2.329	1.973	1.973	1.637	1.279	1.637	1.279	1.637	1.279	1.637	1.279
88	2.558	2.327	1.972	1.972	1.636	1.279	1.636	1.279	1.636	1.279	1.636	1.279
89	2.555	2.325	1.971	1.971	1.635	1.278	1.635	1.278	1.635	1.278	1.635	1.278
90	2.552	2.323	1.970	1.970	1.634	1.278	1.634	1.278	1.634	1.278	1.634	1.278
91	2.549	2.321	1.969	1.969	1.633	1.277	1.633	1.277	1.633			