

Table A.1 Standard Normal Distribution

Let  $Z$  be a normal random variable with mean zero and variance 1. For selected values of  $Z$ , three values are tabled: (1) the two-sided  $p$ -value, or  $P[|Z| \geq z]$ ; (2) the one-sided  $p$ -value, or  $P[Z \geq z]$ ; and (3) the cumulative distribution function at  $Z$ , or  $P[Z \leq z]$ .

$z$	Two-sided	One-sided	Cum-dist.	$z$	Two-sided	One-sided	Cum-dist.	$z$	Two-sided	One-sided	Cum-dist.
0.00	1.0000	.5000	.5000	1.30	.1936	.0968	.9032	1.80	.0719	.0359	.9641
0.05	.9601	.4801	.5199	1.31	.1902	.0951	.9049	1.81	.0703	.0351	.9649
0.10	.9203	.4602	.5398	1.32	.1868	.0934	.9066	1.82	.0688	.0344	.9656
0.15	.8808	.4404	.5596	1.33	.1835	.0918	.9082	1.83	.0673	.0336	.9664
0.20	.8415	.4207	.5793	1.34	.1802	.0901	.9099	1.84	.0658	.0329	.9671
0.25	.8026	.4013	.5987	1.35	.1770	.0885	.9115	1.85	.0643	.0322	.9678
0.30	.7642	.3821	.6179	1.36	.1738	.0869	.9131	1.86	.0629	.0314	.9686
0.35	.7263	.3632	.6368	1.37	.1707	.0853	.9147	1.87	.0615	.0307	.9693
0.40	.6892	.3446	.6554	1.38	.1676	.0838	.9162	1.88	.0601	.0301	.9699
0.45	.6527	.3264	.6736	1.39	.1645	.0823	.9177	1.89	.0588	.0294	.9706
0.50	.6171	.3085	.6915	1.40	.1615	.0808	.9192	1.90	.0574	.0287	.9713
0.55	.5823	.2912	.7088	1.41	.1585	.0793	.9207	1.91	.0561	.0281	.9719
0.60	.5485	.2743	.7257	1.42	.1556	.0778	.9222	1.92	.0549	.0274	.9726
0.65	.5157	.2578	.7422	1.43	.1527	.0764	.9236	1.93	.0536	.0268	.9732
0.70	.4839	.2420	.7580	1.44	.1499	.0749	.9251	1.94	.0524	.0262	.9738
0.75	.4533	.2266	.7734	1.45	.1471	.0735	.9265	1.95	.0512	.0256	.9744
0.80	.4237	.2119	.7881	1.46	.1443	.0721	.9279	1.96	.0500	.0250	.9750
0.85	.3953	.1977	.8023	1.47	.1416	.0708	.9292	1.97	.0488	.0244	.9756
0.90	.3681	.1841	.8159	1.48	.1389	.0694	.9306	1.98	.0477	.0239	.9761
0.95	.3421	.1711	.8289	1.49	.1362	.0681	.9319	1.99	.0466	.0233	.9767
1.00	.3173	.1587	.8413	1.50	.1336	.0668	.9332	2.00	.0455	.0228	.9772
1.01	.3125	.1562	.8438	1.51	.1310	.0655	.9345	2.01	.0444	.0222	.9778
1.02	.3077	.1539	.8461	1.52	.1285	.0643	.9357	2.02	.0434	.0217	.9783
1.03	.3030	.1515	.8485	1.53	.1260	.0630	.9370	2.03	.0424	.0212	.9788
1.04	.2983	.1492	.8508	1.54	.1236	.0618	.9382	2.04	.0414	.0207	.9793
1.05	.2937	.1469	.8531	1.55	.1211	.0606	.9394	2.05	.0404	.0202	.9798
1.06	.2891	.1446	.8554	1.56	.1188	.0594	.9406	2.06	.0394	.0197	.9803
1.07	.2846	.1423	.8577	1.57	.1164	.0582	.9418	2.07	.0385	.0192	.9808
1.08	.2801	.1401	.8599	1.58	.1141	.0571	.9429	2.08	.0375	.0188	.9812
1.09	.2757	.1379	.8621	1.59	.1118	.0559	.9441	2.09	.0366	.0183	.9817
1.10	.2713	.1357	.8643	1.60	.1096	.0548	.9452	2.10	.0357	.0179	.9821
1.11	.2670	.1335	.8665	1.61	.1074	.0537	.9463	2.11	.0349	.0174	.9826
1.12	.2627	.1314	.8686	1.62	.1052	.0526	.9474	2.12	.0340	.0170	.9830
1.13	.2585	.1292	.8708	1.63	.1031	.0516	.9484	2.13	.0332	.0166	.9834
1.14	.2543	.1271	.8729	1.64	.1010	.0505	.9495	2.14	.0324	.0162	.9838
1.15	.2501	.1251	.8749	1.65	.0989	.0495	.9505	2.15	.0316	.0158	.9842
1.16	.2460	.1230	.8770	1.66	.0969	.0485	.9515	2.16	.0308	.0154	.9846
1.17	.2420	.1210	.8790	1.67	.0949	.0475	.9525	2.17	.0300	.0150	.9850
1.18	.2380	.1190	.8810	1.68	.0930	.0465	.9535	2.18	.0293	.0146	.9854
1.19	.2340	.1170	.8830	1.69	.0910	.0455	.9545	2.19	.0285	.0143	.9857
1.20	.2301	.1151	.8849	1.70	.0891	.0446	.9554	2.20	.0278	.0139	.9861
1.21	.2263	.1131	.8869	1.71	.0873	.0436	.9564	2.21	.0271	.0136	.9864
1.22	.2225	.1112	.8888	1.72	.0854	.0427	.9573	2.22	.0264	.0132	.9868
1.23	.2187	.1093	.8907	1.73	.0836	.0418	.9582	2.23	.0257	.0129	.9871
1.24	.2150	.1075	.8925	1.74	.0819	.0409	.9591	2.24	.0251	.0125	.9875
1.25	.2113	.1056	.8944	1.75	.0801	.0401	.9599	2.25	.0244	.0122	.9878
1.26	.2077	.1038	.8962	1.76	.0784	.0392	.9608	2.26	.0238	.0119	.9881
1.27	.2041	.1020	.8980	1.77	.0767	.0384	.9616	2.27	.0232	.0116	.9884
1.28	.2005	.1003	.8997	1.78	.0751	.0375	.9625	2.28	.0226	.0113	.9887
1.29	.1971	.0985	.9015	1.79	.0735	.0367	.9633	2.29	.0220	.0110	.9890

Table A.1 (continued)

z	Two-sided	One-sided	Cum-dist.	z	Two-sided	One-sided	Cum-dist.	z	Two-sided	One-sided	Cum-dist.
2.30	.0214	.0107	.9893	2.80	.0051	.0026	.9974	3.30	.0010	.0005	.9995
2.31	.0209	.0104	.9896	2.81	.0050	.0025	.9975	3.31	.0009	.0005	.9995
2.32	.0203	.0102	.9898	2.82	.0048	.0024	.9976	3.32	.0009	.0005	.9995
2.33	.0198	.0099	.9901	2.83	.0047	.0023	.9977	3.33	.0009	.0004	.9996
2.34	.0193	.0096	.9904	2.84	.0045	.0023	.9977	3.34	.0008	.0004	.9996
2.35	.0188	.0094	.9906	2.85	.0044	.0022	.9978	3.35	.0008	.0004	.9996
2.36	.0183	.0091	.9909	2.86	.0042	.0021	.9979	3.36	.0008	.0004	.9996
2.37	.0178	.0089	.9911	2.87	.0041	.0021	.9979	3.37	.0008	.0004	.9996
2.38	.0173	.0087	.9913	2.88	.0040	.0020	.9980	3.38	.0007	.0004	.9996
2.39	.0168	.0084	.9916	2.89	.0039	.0019	.9981	3.39	.0007	.0003	.9997
2.40	.0164	.0082	.9918	2.90	.0037	.0019	.9981	3.40	.0007	.0003	.9997
2.41	.0160	.0080	.9920	2.91	.0036	.0018	.9982	3.41	.0006	.0003	.9997
2.42	.0155	.0078	.9922	2.92	.0035	.0018	.9982	3.42	.0006	.0003	.9997
2.43	.0151	.0075	.9925	2.93	.0034	.0017	.9983	3.43	.0006	.0003	.9997
2.44	.0147	.0073	.9927	2.94	.0033	.0016	.9984	3.44	.0006	.0003	.9997
2.45	.0143	.0071	.9929	2.95	.0032	.0016	.9984	3.45	.0006	.0003	.9997
2.46	.0139	.0069	.9931	2.96	.0031	.0015	.9985	3.46	.0005	.0003	.9997
2.47	.0135	.0068	.9932	2.97	.0030	.0015	.9985	3.47	.0005	.0003	.9997
2.48	.0131	.0066	.9934	2.98	.0029	.0014	.9986	3.48	.0005	.0003	.9997
2.49	.0128	.0064	.9936	2.99	.0028	.0014	.9986	3.49	.0005	.0002	.9998
2.50	.0124	.0062	.9938	3.00	.0027	.0013	.9987	3.50	.0005	.0002	.9998
2.51	.0121	.0060	.9940	3.01	.0026	.0013	.9987	3.51	.0004	.0002	.9998
2.52	.0117	.0059	.9941	3.02	.0025	.0013	.9987	3.52	.0004	.0002	.9998
2.53	.0114	.0057	.9943	3.03	.0024	.0012	.9988	3.53	.0004	.0002	.9998
2.54	.0111	.0055	.9945	3.04	.0024	.0012	.9988	3.54	.0004	.0002	.9998
2.55	.0108	.0054	.9946	3.05	.0023	.0011	.9989	3.55	.0004	.0002	.9998
2.56	.0105	.0052	.9948	3.06	.0022	.0011	.9989	3.56	.0004	.0002	.9998
2.57	.0102	.0051	.9949	3.07	.0021	.0011	.9989	3.57	.0004	.0002	.9998
2.58	.0099	.0049	.9951	3.08	.0021	.0010	.9990	3.58	.0003	.0002	.9998
2.59	.0096	.0048	.9952	3.09	.0020	.0010	.9990	3.59	.0003	.0002	.9998
2.60	.0093	.0047	.9953	3.10	.0019	.0010	.9990	3.60	.0003	.0002	.9998
2.61	.0091	.0045	.9955	3.11	.0019	.0009	.9991	3.61	.0003	.0002	.9998
2.62	.0088	.0044	.9956	3.12	.0018	.0009	.9991	3.62	.0003	.0001	.9999
2.63	.0085	.0043	.9957	3.13	.0017	.0009	.9991	3.63	.0003	.0001	.9999
2.64	.0083	.0041	.9959	3.14	.0017	.0008	.9992	3.64	.0003	.0001	.9999
2.65	.0080	.0040	.9960	3.15	.0016	.0008	.9992	3.65	.0003	.0001	.9999
2.66	.0078	.0039	.9961	3.16	.0016	.0008	.9992	3.66	.0003	.0001	.9999
2.67	.0076	.0038	.9962	3.17	.0015	.0008	.9992	3.67	.0002	.0001	.9999
2.68	.0074	.0037	.9963	3.18	.0015	.0007	.9993	3.68	.0002	.0001	.9999
2.69	.0071	.0036	.9964	3.19	.0014	.0007	.9993	3.69	.0002	.0001	.9999
2.70	.0069	.0035	.9965	3.20	.0014	.0007	.9993	3.70	.0002	.0001	.9999
2.71	.0067	.0034	.9966	3.21	.0013	.0007	.9993	3.71	.0002	.0001	.9999
2.72	.0065	.0033	.9967	3.22	.0013	.0006	.9994	3.72	.0002	.0001	.9999
2.73	.0063	.0032	.9968	3.23	.0012	.0006	.9994	3.73	.0002	.0001	.9999
2.74	.0061	.0031	.9969	3.24	.0012	.0006	.9994	3.74	.0002	.0001	.9999
2.75	.0060	.0030	.9970	3.25	.0012	.0006	.9994	3.75	.0002	.0001	.9999
2.76	.0058	.0029	.9971	3.26	.0011	.0006	.9994	3.76	.0002	.0001	.9999
2.77	.0056	.0028	.9972	3.27	.0011	.0005	.9995	3.77	.0002	.0001	.9999
2.78	.0054	.0027	.9973	3.28	.0010	.0005	.9995	3.78	.0002	.0001	.9999
2.79	.0053	.0026	.9974	3.29	.0010	.0005	.9995	3.79	.0002	.0001	.9999