

**Table 3 Natural logarithms**

N	0	1	2	3	4	5	6	7	8	9
1.0	0000	0100	0198	0296	0392	0488	0583	0677	0770	0862
1.1	0953	1044	1133	1222	1310	1398	1484	1570	1655	1740
1.2	1823	1906	1989	2070	2151	2231	2311	2390	2469	2546
1.3	2624	2700	2776	2852	2927	3001	3075	3148	3221	3293
1.4	3365	3436	3507	3577	3646	3716	3784	3853	3920	3988
1.5	4055	4121	4187	4253	4318	4383	4447	4511	4574	4637
1.6	4700	4762	4824	4886	4947	5008	5068	5128	5188	5247
1.7	5306	5365	5423	5481	5539	5596	5653	5710	5766	5822
1.8	5878	5933	5988	6043	6098	6152	6206	6259	6313	6366
1.9	6419	6471	6523	6575	6627	6678	6729	6780	6831	6881
2.0	6931	6981	7031	7080	7129	7178	7227	7275	7324	7372
2.1	7419	7467	7514	7561	7608	7655	7701	7747	7793	7839
2.2	7885	7930	7975	8020	8065	8109	8154	8198	8242	8286
2.3	8329	8372	8416	8459	8502	8544	8587	8629	8671	8713
2.4	8755	8796	8838	8879	8920	8961	9002	9042	9083	9123
2.5	9163	9203	9243	9282	9322	9361	9400	9439	9478	9517
2.6	9555	9594	9632	9670	9708	9746	9783	9821	9858	9895
2.7	9933	9969	*0006	*0043	*0080	*0116	*0152	*0188	*0225	*0260
2.8	1.0296	0332	0367	0403	0438	0473	0508	0543	0578	0613
2.9	0647	0682	0716	0750	0784	0818	0852	0886	0919	0953
3.0	1.0986	1019	1053	1086	1119	1151	1184	1217	1249	1282
3.1	1314	1346	1378	1410	1442	1474	1506	1537	1569	1600
3.2	1632	1663	1694	1725	1756	1787	1817	1848	1878	1909
3.3	1939	1969	2000	2030	2060	2090	2119	2149	2179	2208
3.4	2238	2267	2296	2326	2355	2384	2413	2442	2470	2499
3.5	1.2528	2556	2585	2613	2641	2669	2698	2726	2754	2782
3.6	2809	2837	2865	2892	2920	2947	2975	3002	3029	3056
3.7	3083	3110	3137	3164	3191	3218	3244	3271	3297	3324
3.8	3350	3376	3403	3429	3455	3481	3507	3533	3558	3584
3.9	3610	3635	3661	3686	3712	3737	3762	3788	3813	3838
4.0	1.3863	3888	3913	3938	3962	3987	4012	4036	4061	4085
4.1	4110	4134	4159	4183	4207	4231	4255	4279	4303	4327
4.2	4351	4375	4398	4422	4446	4469	4493	4516	4540	4563
4.3	4586	4609	4633	4656	4679	4702	4725	4748	4770	4793
4.4	4816	4839	4861	4884	4907	4929	4951	4974	4996	5019
4.5	1.5041	5063	5085	5107	5129	5151	5173	5195	5217	5239
4.6	5261	5282	5304	5326	5347	5369	5390	5412	5433	5454
4.7	5476	5497	5518	5539	5560	5581	5602	5623	5644	5665
4.8	5686	5707	5728	5748	5769	5790	5810	5831	5851	5872
4.9	5892	5913	5933	5953	5974	5994	6014	6034	6054	6074
5.0	1.6094	6114	6134	6154	6174	6194	6214	6233	6253	6273
5.1	6292	6312	6332	6351	6371	6390	6409	6429	6448	6467
5.2	6487	6506	6525	6544	6563	6582	6601	6620	6639	6658
5.3	6677	6696	6715	6734	6752	6771	6790	6808	6827	6845
5.4	6864	6882	6901	6919	6938	6956	6974	6993	7011	7029

Table 3 (Continued)

N	0	1	2	3	4	5	6	7	8	9
5.5	1.7047	7066	7084	7102	7120	7138	7156	7174	7192	7210
5.6	7228	7246	7263	7281	7299	7317	7334	7352	7370	7387
5.7	7405	7422	7440	7457	7475	7492	7509	7527	7544	7561
5.8	7579	7596	7613	7630	7647	7664	7681	7699	7716	7733
5.9	7750	7766	7783	7800	7817	7834	7851	7867	7884	7901
6.0	1.7918	7934	7951	7967	7984	8001	8017	8034	8050	8066
6.1	8083	8099	8116	8132	8148	8165	8181	8197	8213	8229
6.2	8245	8262	8278	8294	8310	8326	8342	8358	8374	8390
6.3	8405	8421	8437	8453	8469	8485	8500	8516	8532	8547
6.4	8563	8579	8594	8610	8625	8641	8656	8672	8687	8703
6.5	1.8718	8733	8749	8764	8779	8795	8810	8825	8840	8856
6.6	8871	8886	8901	8916	8931	8946	8961	8976	8991	9006
6.7	9021	9036	9051	9066	9081	9095	9110	9125	9140	9155
6.8	9169	9184	9199	9213	9228	9242	9257	9272	9286	9301
6.9	9315	9330	9344	9359	9373	9387	9402	9416	9430	9445
7.0	1.9459	9473	9488	9502	9516	9530	9544	9559	9573	9587
7.1	9601	9615	9629	9643	9657	9671	9685	9699	9713	9727
7.2	9741	9755	9769	9782	9796	9810	9824	9838	9851	9865
7.3	9879	9892	9906	9920	9933	9947	9961	9974	9988	*0001
7.4	2.0015	0028	0042	0055	0069	0082	0096	0109	0122	0136
7.5	2.0149	0162	0176	0189	0202	0215	0229	0242	0255	0268
7.6	0281	0295	0308	0321	0334	0347	0360	0373	0386	0399
7.7	0412	0425	0438	0451	0464	0477	0490	0503	0516	0528
7.8	0541	0554	0567	0580	0592	0605	0618	0630	0643	0656
7.9	0669	0681	0694	0707	0719	0732	0744	0757	0769	0782
8.0	2.0794	0807	0819	0832	0844	0857	0869	0882	0894	0906
8.1	0919	0931	0943	0956	0968	0980	0992	1005	1017	1029
8.2	1041	1054	1066	1078	1090	1102	1114	1126	1138	1150
8.3	1163	1175	1187	1199	1211	1223	1235	1247	1258	1270
8.4	1282	1294	1306	1318	1330	1342	1353	1365	1377	1389
8.5	2.1401	1412	1424	1436	1448	1459	1471	1483	1494	1506
8.6	1518	1529	1541	1552	1564	1576	1587	1599	1610	1622
8.7	1633	1645	1656	1668	1679	1691	1702	1713	1725	1736
8.8	1748	1759	1770	1782	1793	1804	1815	1827	1838	1849
8.9	1861	1872	1883	1894	1905	1917	1928	1939	1950	1961
9.0	2.1972	1983	1994	2006	2017	2028	2039	2050	2061	2072
9.1	2083	2094	2105	2116	2127	2138	2148	2159	2170	2181
9.2	2192	2203	2214	2225	2235	2246	2257	2268	2279	2289
9.3	2300	2311	2322	2332	2343	2354	2364	2375	2386	2396
9.4	2407	2418	2428	2439	2450	2460	2471	2481	2492	2502
9.5	2.2513	2523	2534	2544	2555	2565	2576	2586	2597	2607
9.6	2618	2628	2638	2649	2659	2670	2680	2690	2701	2711
9.7	2721	2732	2742	2752	2762	2773	2783	2793	2803	2814
9.8	2824	2834	2844	2854	2865	2875	2885	2895	2905	2915
9.9	2925	2935	2946	2956	2966	2976	2986	2996	3006	3016

Use  $\ln 10 = 2.30259$  to find logarithms of numbers greater than 10 or less than 1. Example  
 $\ln 220 = \ln 2.2 + 2 \ln 10 = 0.7885 + 2(2.30259) = 5.3937$ .

**Table 4 Exponential functions**

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
0.00	1.0000	0.00000	1.000000	0.50	1.6487	0.21715	0.606531
0.01	1.0101	.00434	0.990050	0.51	1.6653	.22149	.600496
0.02	1.0202	.00869	.980199	0.52	1.6820	.22583	.594521
0.03	1.0305	.01303	.970446	0.53	1.6989	.23018	.588605
0.04	1.0408	.01737	.960789	0.54	1.7160	.23452	.582748
0.05	1.0513	0.02171	0.951229	0.55	1.7333	0.23886	0.576950
0.06	1.0618	.02606	.941765	0.56	1.7507	.24320	.571209
0.07	1.0725	.03040	.932394	0.57	1.7683	.24755	.565525
0.08	1.0833	.03474	.923116	0.58	1.7860	.25189	.559898
0.09	1.0942	.03909	.913931	0.59	1.8040	.25623	.554327
0.10	1.1052	0.04343	0.904837	0.60	1.8221	0.26058	0.548812
0.11	1.1163	.04777	.895834	0.61	1.8404	.26492	.543351
0.12	1.1275	.05212	.886920	0.62	1.8589	.26926	.537944
0.13	1.1388	.05646	.878095	0.63	1.8776	.27361	.532592
0.14	1.1503	.06080	.869358	0.64	1.8965	.27795	.527291
0.15	1.1618	0.06514	0.860708	0.65	1.9155	0.28229	0.522046
0.16	1.1735	.06949	.852144	0.66	1.9348	.28663	.516851
0.17	1.1853	.07383	.843665	0.67	1.9542	.29098	.511709
0.18	1.1972	.07817	.835270	0.68	1.9739	.29532	.506617
0.19	1.2092	.08252	.826959	0.69	1.9937	.29966	.501576
0.20	1.2214	0.08686	0.818731	0.70	2.0138	0.30401	0.496585
0.21	1.2337	.09120	.810584	0.71	2.0340	.30835	.491644
0.22	1.2461	.09554	.802519	0.72	2.0544	.31269	.486752
0.23	1.2586	.09989	.794534	0.73	2.0751	.31703	.481909
0.24	1.2712	.10423	.786628	0.74	2.0959	.32138	.477114
0.25	1.2840	0.10857	0.778801	0.75	2.1170	0.32572	0.472367
0.26	1.2969	.11292	.771052	0.76	2.1383	.33006	.467666
0.27	1.3100	.11726	.763379	0.77	2.1598	.33441	.463013
0.28	1.3231	.12160	.755784	0.78	2.1815	.33875	.458406
0.29	1.3364	.12595	.748264	0.79	2.2034	.34309	.453845
0.30	1.3499	0.13029	0.740818	0.80	2.2255	0.34744	0.449329
0.31	1.3634	.13463	.733447	0.81	2.2479	.35178	.444858
0.32	1.3771	.13897	.726149	0.82	2.2705	.35612	.440432
0.33	1.3910	.14332	.718924	0.83	2.2933	.36046	.436049
0.34	1.4049	.14766	.711770	0.84	2.3164	.36481	.431711
0.35	1.4191	0.15200	0.704688	0.85	2.3396	0.36915	0.427415
0.36	1.4333	.15635	.697676	0.86	2.3632	.37349	.423162
0.37	1.4477	.16069	.690734	0.87	2.3869	.37784	.418952
0.38	1.4623	.16503	.683861	0.88	2.4109	.38218	.414783
0.39	1.4770	.16937	.677057	0.89	2.4351	.38652	.410656
0.40	1.4918	0.17372	0.670320	0.90	2.4596	0.39087	0.406570
0.41	1.5068	.17806	.663650	0.91	2.4843	.39521	.402524
0.42	1.5220	.18240	.657047	0.92	2.5093	.39955	.398519
0.43	1.5373	.18675	.650509	0.93	2.5345	.40389	.394554
0.44	1.5527	.19109	.644036	0.94	2.5600	.40824	.390628
0.45	1.5683	0.19543	0.637628	0.95	2.5857	0.41258	0.386741
0.46	1.5841	.19978	.631284	0.96	2.6117	.41692	.382893
0.47	1.6000	.20412	.625002	0.97	2.6379	.42127	.379083
0.48	1.6161	.20846	.618783	0.98	2.6645	.42561	.375311
0.49	1.6323	.21280	.612626	0.99	2.6912	.42995	.371577
0.50	1.6487	0.21715	0.606531	1.00	2.7183	0.43429	0.367879

Table 4 (Continued)

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
1.00	2.7183	0.43429	0.367879	1.50	4.4817	0.65144	0.223130
1.01	2.7456	.43864	.364219	1.51	4.5267	.65578	.220910
1.02	2.7732	.44298	.360595	1.52	4.5722	.66013	.218712
1.03	2.8011	.44732	.357007	1.53	4.6182	.66447	.216536
1.04	2.8292	.45167	.353455	1.54	4.6646	.66881	.214381
1.05	2.8577	0.45601	0.349938	1.55	4.7115	0.67316	0.212248
1.06	2.8864	.46035	.346456	1.56	4.7588	.67750	.210136
1.07	2.9154	.46470	.343009	1.57	4.8066	.68184	.208045
1.08	2.9447	.46904	.339596	1.58	4.8550	.68619	.205975
1.09	2.9743	.47338	.336216	1.59	4.9037	.69053	.203926
1.10	3.0042	0.47772	0.332871	1.60	4.9530	0.69487	0.201897
1.11	3.0344	.48207	.329559	1.61	5.0028	.69921	.199888
1.12	3.0649	.48641	.326280	1.62	5.0531	.70356	.197899
1.13	3.0957	.49075	.323033	1.63	5.1039	.70790	.195930
1.14	3.1268	.49510	.319819	1.64	5.1552	.71224	.193980
1.15	3.1582	0.49944	0.316637	1.65	5.2070	0.71659	0.192050
1.16	3.1899	.50378	.313486	1.66	5.2593	.72093	.190139
1.17	3.2220	.50812	.310367	1.67	5.3122	.72527	.188247
1.18	3.2544	.51247	.307279	1.68	5.3656	.72961	.186374
1.19	3.2871	.51681	.304221	1.69	5.4195	.73396	.184520
1.20	3.3201	0.52115	0.301194	1.70	5.4739	0.73830	0.182684
1.21	3.3535	.52550	.298197	1.71	5.5290	.74264	.180866
1.22	3.3872	.52984	.295230	1.72	5.5845	.74699	.179066
1.23	3.4212	.53418	.292293	1.73	5.6407	.75133	.177284
1.24	3.4556	.53853	.289384	1.74	5.6973	.75567	.175520
1.25	3.4903	0.54287	0.286505	1.75	5.7546	0.76002	0.173774
1.26	3.5254	.54721	.283654	1.76	5.8124	.76436	.172045
1.27	3.5609	.55155	.280832	1.77	5.8709	.76870	.170333
1.28	3.5966	.55590	.278037	1.78	5.9299	.77304	.168638
1.29	3.6328	.56024	.275271	1.79	5.9895	.77739	.166960
1.30	3.6693	0.56458	0.272532	1.80	6.0496	0.78173	0.165299
1.31	3.7062	.56893	.269820	1.81	6.1104	.78607	.163654
1.32	3.7434	.57327	.267135	1.82	6.1719	.79042	.162026
1.33	3.7810	.57761	.264477	1.83	6.2339	.79476	.160414
1.34	3.8190	.58195	.261846	1.84	6.2965	.79910	.158817
1.35	3.8574	0.58630	0.259240	1.85	6.3598	0.80344	0.157237
1.36	3.8962	.59064	.256661	1.86	6.4237	.80779	.155673
1.37	3.9354	.59498	.254107	1.87	6.4483	.81213	.154124
1.38	3.9749	.59933	.251579	1.88	6.5535	.81647	.152590
1.39	4.0149	.60367	.249075	1.89	6.6194	.82082	.151072
1.40	4.0552	0.60801	0.246597	1.90	6.6859	0.82516	0.149569
1.41	4.0960	.61236	.244143	1.91	6.7531	.82950	.148080
1.42	4.1371	.61670	.241714	1.92	6.8210	.83385	.146607
1.43	4.1787	.62104	.239309	1.93	6.8895	.83819	.145148
1.44	4.2207	.62538	.236928	1.94	6.9588	.84253	.143704
1.45	4.2631	0.62973	0.234570	1.95	7.0287	0.84687	0.142274
1.46	4.3060	.63407	.232236	1.96	7.0993	.85122	.140858
1.47	4.3492	.63841	.229925	1.97	7.1707	.85556	.139457
1.48	4.3929	.64276	.227638	1.98	7.2427	.85990	.138069
1.49	4.4371	.64710	.225373	1.99	7.3155	.86425	.136695
1.50	4.4817	0.65144	0.223130	2.00	7.3891	0.86859	0.135335

Table 4 (Continued)

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
2.00	7.3891	0.86859	0.135335	2.50	12.182	1.08574	0.082085
2.01	7.4633	.87293	.133989	2.51	12.305	1.09008	.081268
2.02	7.5383	.87727	.132655	2.52	12.429	1.09442	.080460
2.03	7.6141	.88162	.131336	2.53	12.554	1.09877	.079659
2.04	7.6906	.88596	.130029	2.54	12.680	1.10311	.078866
2.05	7.7679	0.89030	0.128735	2.55	12.807	1.10745	0.078082
2.06	7.8460	.89465	.127454	2.56	12.936	1.11179	.077305
2.07	7.9248	.89899	.126186	2.57	13.066	1.11614	.076536
2.08	8.0045	.90333	.124930	2.58	13.197	1.12048	.075774
2.09	8.0849	.90756	.123687	2.59	13.330	1.12482	.075020
2.10	8.1662	0.91202	0.122456	2.60	13.464	1.12917	0.074274
2.11	8.2482	.91636	.121238	2.61	13.599	1.13351	.073535
2.12	8.3311	.92070	.120032	2.62	13.736	1.13785	.072803
2.13	8.4149	.92505	.118837	2.63	13.874	1.14219	.072078
2.14	8.4994	.92939	.117655	2.64	14.013	1.14654	.071361
2.15	8.5849	0.93373	0.116484	2.65	14.154	1.15088	.070651
2.16	8.6711	.93808	.115325	2.66	14.296	1.15522	.069948
2.17	8.7583	.94242	.114178	2.67	14.440	1.15957	.069252
2.18	8.8463	.94676	.113042	2.68	14.585	1.16391	.068563
2.19	8.9352	.95110	.111917	2.69	14.732	1.16825	.067881
2.20	9.0250	0.95545	0.110803	2.70	14.880	1.17260	0.067206
2.21	9.1157	.95979	.109701	2.71	15.029	1.17694	.066537
2.22	9.2073	.96413	.108609	2.72	15.180	1.18128	.065875
2.23	9.2999	.96848	.107528	2.73	15.333	1.18562	.065219
2.24	9.3933	.97282	.106459	2.74	15.487	1.18997	.064570
2.25	9.4877	0.97716	0.105399	2.75	15.643	1.19431	0.063928
2.26	9.5831	.98151	.104350	2.76	15.800	1.19865	.063292
2.27	9.6794	.98585	.103312	2.77	15.959	1.20300	.062662
2.28	9.7767	.99019	.102284	2.78	16.119	1.20734	.062039
2.29	9.8749	.99453	.101266	2.79	16.281	1.21168	.061421
2.30	9.9742	0.99888	0.100259	2.80	16.445	1.21602	0.060810
2.31	10.074	1.00322	.099261	2.81	16.610	1.22037	.060205
2.32	10.176	1.00756	.098274	2.82	16.777	1.22471	.059606
2.33	10.278	1.01191	.097296	2.83	16.945	1.22905	.059013
2.34	10.381	1.01625	.096328	2.84	17.116	1.23340	.058426
2.35	10.486	1.02059	0.095369	2.85	17.288	1.23774	0.057844
2.36	10.591	1.02493	.094420	2.86	17.462	1.24208	.057269
2.37	10.697	1.02928	.093481	2.87	17.637	1.24643	.056699
2.38	10.805	1.03362	.092551	2.88	17.814	1.25077	.056135
2.39	10.913	1.03796	.091630	2.89	17.993	1.25511	.055576
2.40	11.023	1.04231	0.090718	2.90	18.174	1.25945	0.055023
2.41	11.134	1.04665	.089815	2.91	18.357	1.26380	.054476
2.42	11.246	1.05099	.088922	2.92	18.541	1.26814	.053934
2.43	11.359	1.05534	.088037	2.93	18.728	1.27248	.053397
2.44	11.473	1.05968	.087161	2.94	18.916	1.27683	.052866
2.45	11.588	1.06402	0.086294	2.95	19.106	1.28117	0.052340
2.46	11.705	1.06836	.085435	2.96	19.298	1.28551	.051819
2.47	11.822	1.07271	.084585	2.97	19.492	1.28985	.051303
2.48	11.941	1.07705	.083743	2.98	19.688	1.29420	.050793
2.49	12.061	1.08139	.082910	2.99	19.886	1.29854	.050287
2.50	12.182	1.08574	0.082085	3.00	20.086	1.30288	0.049787

**Table 4 (Continued)**

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
3.00	20.086	1.30288	0.049787	3.50	33.115	1.52003	0.030197
3.01	20.287	1.30723	.049292	3.51	33.448	1.52437	.029897
3.02	20.491	1.31157	.048801	3.52	33.784	1.52872	.029599
3.03	20.697	1.31591	.048316	3.53	34.124	1.53306	.029305
3.04	20.905	1.32025	.047835	3.54	34.467	1.53740	.029013
3.05	21.115	1.32460	0.047359	3.55	34.813	1.54175	0.028725
3.06	21.328	1.32894	.046888	3.56	35.163	1.54609	.028439
3.07	21.542	1.33328	.046421	3.57	35.517	1.55043	.028156
3.08	21.758	1.33763	.045959	3.58	35.874	1.55477	.027876
3.09	21.977	1.34197	.045502	3.59	36.234	1.55912	.027598
3.10	22.198	1.34631	0.045049	3.60	36.598	1.56346	0.027324
3.11	22.421	1.35066	.044601	3.61	36.966	1.56780	.027052
3.12	22.646	1.35500	.044157	3.62	37.338	1.57215	.026783
3.13	22.874	1.35934	.043718	3.63	37.713	1.57649	.026516
3.14	23.104	1.36368	.043283	3.64	38.092	1.58083	.026252
3.15	23.336	1.36803	0.042852	3.65	38.475	1.58517	0.025991
3.16	23.571	1.37237	.042426	3.66	38.861	1.58952	.025733
3.17	23.807	1.36671	.042004	3.67	39.252	1.59386	.025476
3.18	24.047	1.38106	.041586	3.68	39.646	1.59820	.025223
3.19	24.288	1.38540	.041172	3.69	40.045	1.60255	.024972
3.20	24.533	1.38974	0.040764	3.70	40.447	1.60689	0.024724
3.21	24.779	1.39409	.040357	3.71	40.854	1.61123	.024478
3.22	25.028	1.39843	.039955	3.72	41.264	1.61558	.024234
3.23	25.280	1.40277	.039557	3.73	41.679	1.61992	.023993
3.24	25.534	1.40711	.039164	3.74	42.098	1.62426	.023754
3.25	25.790	1.41146	0.038774	3.75	42.521	1.62860	0.023518
3.26	26.050	1.41580	.038388	3.76	42.948	1.63295	.023284
3.27	26.311	1.42014	.038006	3.77	43.380	1.63729	.023052
3.28	26.576	1.42449	.037628	3.78	43.816	1.64163	.022823
3.29	26.843	1.42883	.037254	3.79	44.256	1.64598	.022596
3.30	27.113	1.44317	0.036883	3.80	44.701	1.65032	0.022371
3.31	27.385	1.43751	.036516	3.81	45.150	1.65466	.022148
3.32	27.660	1.44186	.036153	3.82	45.604	1.65900	.021928
3.33	27.938	1.44620	.035793	3.83	46.063	1.66335	.021710
3.34	28.219	1.45054	.035437	3.84	46.525	1.66769	.021494
3.35	28.503	1.45489	0.035084	3.85	46.993	1.67203	0.021280
3.36	28.789	1.45923	.034735	3.86	47.465	1.67638	.021068
3.37	29.079	1.46357	.034390	3.87	47.942	1.68072	.020858
3.38	29.371	1.46792	.034047	3.88	48.424	1.68506	.020651
3.39	29.666	1.47226	.033709	3.89	48.911	1.68941	.020445
3.40	29.964	1.47660	0.033373	3.90	49.402	1.69375	0.020242
3.41	30.265	1.48094	.033041	3.91	49.899	1.69809	.020041
3.42	30.569	1.48529	.032712	3.92	50.400	1.70243	.019840
3.43	30.877	1.48963	.032387	3.93	50.907	1.70678	.019644
3.44	31.187	1.49397	.032065	3.94	51.419	1.71112	.019448
3.45	31.500	1.49832	0.031746	3.95	51.935	1.71546	0.019255
3.46	31.817	1.50266	.031430	3.96	52.457	1.71981	.019063
3.47	32.137	1.50700	.031117	3.97	52.985	1.72415	.018873
3.48	32.460	1.51134	.030807	3.98	53.517	1.72849	.018686
3.49	32.786	1.51569	.030501	3.99	54.055	1.73283	.018500
3.50	33.115	1.52003	0.030197	4.00	54.598	1.73718	0.018316

Table 4 (Continued)

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
4.00	54.598	1.73718	0.018316	4.50	90.017	1.95433	0.011109
4.01	55.147	1.74152	.018133	4.51	90.922	1.95867	.010998
4.02	55.701	1.74586	.017953	4.52	91.836	1.96301	.010889
4.03	56.261	1.75021	.017774	4.53	92.759	1.96735	.010781
4.04	56.826	1.75455	.017597	4.54	93.691	1.97170	.010673
4.05	57.397	1.75889	0.017422	4.55	94.632	1.97604	0.010567
4.06	57.974	1.76324	.017249	4.56	95.583	1.98038	.010462
4.07	58.577	1.76758	.017077	4.57	96.544	1.98473	.010358
4.08	59.145	1.77192	.016907	4.58	97.514	1.98907	.010255
4.09	59.740	1.77626	.016739	4.59	98.494	1.99341	.010153
4.10	60.340	1.78061	0.016573	4.60	99.484	1.99775	0.010052
4.11	60.947	1.78495	.016408	4.61	100.48	2.00210	.009952
4.12	61.559	1.78929	.016245	4.62	101.49	2.00644	.009853
4.13	62.178	1.79364	.016083	4.63	102.51	2.01078	.009755
4.14	62.803	1.79798	.015923	4.64	103.54	2.01513	.009658
4.15	63.434	1.80232	0.015764	4.65	104.58	2.01947	0.009562
4.16	64.072	1.80667	.015608	4.66	105.64	2.02381	.009466
4.17	64.715	1.81101	.015452	4.67	106.70	2.02816	.009372
4.18	65.366	1.81535	.015299	4.68	107.77	2.03250	.009279
4.19	66.023	1.81969	.015146	4.69	108.85	2.03684	.009187
4.20	66.686	1.82404	0.014996	4.70	109.95	2.04118	0.009095
4.21	67.357	1.82838	.014846	4.71	111.05	2.04553	.009005
4.22	68.033	1.83272	.014699	4.72	112.17	2.04987	.008915
4.23	68.717	1.83707	.014552	4.73	113.30	2.05421	.008825
4.24	69.408	1.84141	.014408	4.74	114.43	2.05856	.008739
4.25	70.105	1.84575	0.014264	4.75	115.58	2.06290	0.008652
4.26	70.810	1.85009	.014122	4.76	116.75	2.06724	.008566
4.27	71.522	1.85444	.013982	4.77	117.92	2.07158	.008480
4.28	72.240	1.85878	.013843	4.78	119.10	2.07593	.008396
4.29	72.966	1.86312	.013705	4.79	120.30	2.08027	.008312
4.30	73.700	1.86747	0.013569	4.80	121.51	2.08461	0.008230
4.31	74.440	1.87181	.013434	4.81	122.73	2.08896	.008148
4.32	75.189	1.87615	.013300	4.82	123.97	2.09330	.008067
4.33	75.944	1.88050	.013168	4.83	125.21	2.09764	.007987
4.34	76.708	1.88484	.013037	4.84	126.47	2.10199	.007907
4.35	77.478	1.88918	0.012907	4.85	127.74	2.10633	0.007828
4.36	78.257	1.89352	.012778	4.86	129.02	2.11067	.007750
4.37	79.044	1.89787	.012651	4.87	130.32	2.11501	.007673
4.38	79.838	1.90221	.012525	4.88	131.63	2.11936	.007597
4.39	80.640	1.90655	.012401	4.89	132.95	2.12370	.007521
4.40	81.451	1.91090	0.012277	4.90	134.29	2.12804	0.007447
4.41	82.269	1.91524	.012155	4.91	135.64	2.13239	.007372
4.42	83.096	1.91958	.012034	4.92	137.00	2.13673	.007299
4.43	83.931	1.92392	.011914	4.93	138.38	2.14107	.007227
4.44	84.775	1.92827	.011796	4.94	139.77	2.14541	.007155
4.45	85.627	1.93261	0.011679	4.95	141.17	2.14976	0.007083
4.46	86.488	1.93695	.011562	4.96	142.59	2.15410	.007013
4.47	87.357	1.94130	.011447	4.97	144.03	2.15844	.006943
4.48	88.235	1.94564	.011333	4.98	145.47	2.16279	.006874
4.49	89.121	1.94998	.011221	4.99	146.94	2.16713	.006806
4.50	90.017	1.95433	0.011109	5.00	148.41	2.17147	0.006738

**Table 4 (Continued)**

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
5.00	148.41	2.17147	0.006738	5.50	244.69	2.38862	0.0040868
5.01	149.90	2.17582	.006671	5.55	257.24	2.41033	.0038875
5.02	151.41	2.18016	.006605	5.60	270.43	2.43205	.0036979
5.03	152.93	2.18450	.006539	5.65	284.29	2.45376	.0035175
5.04	154.47	2.18884	.006474	5.70	298.87	2.47548	.0033460
5.05	156.02	2.19319	0.006409	5.75	314.19	2.49719	0.0031828
5.06	157.59	2.19753	.006346	5.80	330.30	2.51891	.0030276
5.07	159.17	2.20187	.006282	5.85	347.23	2.54062	.0028799
5.08	160.77	2.20622	.006220	5.90	365.04	2.56234	.0027394
5.09	162.39	2.21056	.006158	5.95	383.75	2.58405	.0026058
5.10	164.02	2.21490	0.006097	6.00	403.43	2.60577	0.0024788
5.11	165.67	2.21924	.006036	6.05	424.11	2.62748	.0023579
5.12	167.34	2.22359	.005976	6.10	445.86	2.64920	.0022429
5.13	169.02	2.22793	.005917	6.15	468.72	2.67091	.0021335
5.14	170.72	2.23227	.005858	6.20	492.75	2.69263	.0020294
5.15	172.43	2.23662	0.005799	6.25	518.01	2.71434	0.0019305
5.16	174.16	2.24096	.005742	6.30	544.57	2.73606	.0018363
5.17	175.91	2.24530	.005685	6.35	572.49	2.75777	.0017467
5.18	177.68	2.24965	.005628	6.40	601.85	2.77948	.0016616
5.19	179.47	2.25399	.005572	6.45	632.70	2.80120	.0015805
5.20	181.27	2.25833	0.005517	6.50	665.14	2.82291	0.0015034
5.21	183.09	2.26267	.005462	6.55	699.24	2.84463	.0014301
5.22	184.93	2.26702	.005407	6.60	735.10	2.86634	.0013604
5.23	186.79	2.27136	.005354	6.65	772.78	2.88806	.0012940
5.24	188.67	2.27570	.005300	6.70	812.41	2.90977	.0012309
5.25	190.57	2.28005	0.005248	6.75	854.06	2.93149	0.0011709
5.26	192.48	2.28439	.005195	6.80	897.85	2.95320	.0011138
5.27	194.42	2.28873	.005144	6.85	943.88	2.97492	.0010595
5.28	196.37	2.29307	.005092	6.90	992.27	2.99663	.0010078
5.29	198.34	2.29742	.005042	6.95	1043.1	3.01835	.0009586
5.30	200.34	2.30176	0.004992	7.00	1096.6	3.04006	0.0009119
5.31	202.35	2.30610	.004942	7.05	1152.9	3.06178	.0008674
5.32	204.38	2.31045	.004893	7.10	1212.0	3.08349	.0008251
5.33	206.44	2.31479	.004844	7.15	1274.1	3.10521	.0007849
5.34	208.51	2.31913	.004796	7.20	1339.4	3.12692	.0007466
5.35	210.61	2.32348	0.004748	7.25	1408.1	3.14863	0.0007102
5.36	212.72	2.32782	.004701	7.30	1480.3	3.17035	.0006755
5.37	214.86	2.33216	.004654	7.35	1556.2	3.19206	.0006426
5.38	217.02	2.33650	.004608	7.40	1636.0	3.21378	.0006113
5.39	219.20	2.34085	.004562	7.45	1719.9	3.23549	.0005814
5.40	221.41	2.34519	0.004517	7.50	1808.0	3.25721	0.0005531
5.41	223.63	2.34953	.004472	7.55	1900.7	3.27892	.0005261
5.42	225.88	2.35388	.004427	7.60	1998.2	3.30064	.0005005
5.43	228.15	2.35822	.004383	7.65	2100.6	3.32235	.0004760
5.44	230.44	2.36256	.004339	7.70	2208.3	3.34407	.0004528
5.45	232.76	2.36690	0.004296	7.75	2321.6	3.36578	0.0004307
5.46	235.10	2.37125	.004254	7.80	2440.6	3.38750	.0004097
5.47	237.46	2.37559	.004211	7.85	2565.7	3.40921	.0003898
5.48	239.85	2.37993	.004169	7.90	2697.3	3.43093	.0003707
5.49	242.26	2.38428	.004128	7.95	2835.6	3.45264	.0003527
5.50	244.69	2.38862	0.004087	8.00	2981.0	3.47436	0.0003355



**Table 4 (Continued)**

$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$	$x$	$e^x$	$\log_{10}(e^x)$	$e^{-x}$
8.00	2981.0	3.47436	0.0003355	9.00	8103.1	3.90865	0.0001234
8.05	3133.8	3.49607	.0003191	9.05	8518.5	3.93037	.0001174
8.10	3294.5	3.51779	.0003035	9.10	8955.3	3.95208	.0001117
8.15	3463.4	3.53950	.0002887	9.15	9414.4	3.97379	.0001062
8.20	3641.0	3.56121	.0002747	9.20	9897.1	3.99551	.0001010
8.25	3827.6	3.58293	0.0002613	9.25	10405	4.01722	0.0000961
8.30	4023.9	3.60464	.0002485	9.30	10938	4.03894	.0000914
8.35	4230.2	3.62636	.0002364	9.35	11499	4.06065	.0000870
8.40	4447.1	3.64807	.0002249	9.40	12088	4.08237	.0000827
8.45	4675.1	3.66979	.0002139	9.45	12708	4.10408	.0000787
8.50	4914.8	3.69150	0.0002036	9.50	13360	4.12580	0.0000749
8.55	5166.8	3.71322	.0001935	9.55	14045	4.14751	.0000712
8.60	5431.7	3.73493	.0001841	9.60	14765	4.16923	.0000677
8.65	5710.0	3.75665	.0001751	9.65	15522	4.19094	.0000644
8.70	6002.9	3.77836	.0001666	9.70	16318	4.21266	.0000613
8.75	6310.7	3.80008	0.0001585	9.75	17154	4.23437	0.0000583
8.80	6634.2	3.82179	.0001507	9.80	18034	4.25609	.0000555
8.85	6974.4	3.84351	.0001434	9.85	18958	4.27780	.0000527
8.90	7332.0	3.86522	.0001364	9.90	19930	4.29952	.0000502
8.95	7707.9	3.88694	.0001297	9.95	20952	4.32123	0.0000477
9.00	8103.1	3.90865	0.0001234	10.00	22026	4.34294	0.0000454

Table 5 Amount of \$1  $n$  periods hence at compound interest at rate  $j$  per period:  $(1 + j)^n$

$n$	$\frac{1}{2}\%$	1%	2%	3%	4%	5%	6%	8%	10%
1	1.0050	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0800	1.1000
2	1.0100	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1664	1.2100
3	1.0151	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2597	1.3310
4	1.0201	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3605	1.4641
5	1.0253	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4693	1.6105
6	1.0304	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5869	1.7716
7	1.0355	1.0721	1.1487	1.2299	1.3159	1.4071	1.5036	1.7148	1.9487
8	1.0407	1.0829	1.1717	1.2668	1.3686	1.4775	1.5938	1.8510	2.1436
9	1.0459	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.9990	2.3579
10	1.0511	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	2.1590	2.5937
11	1.0564	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.3316	2.8531
12	1.0617	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.5182	3.1384
13	1.0670	1.1381	1.2936	1.4685	1.6651	1.8856	2.1329	2.7196	3.4523
14	1.0723	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.9372	3.7975
15	1.0777	1.1610	1.3459	1.5580	1.8009	2.0789	2.3966	3.1723	4.1772
16	1.0831	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	3.4260	4.5950
17	1.0885	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.7000	5.0545
18	1.0939	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.9960	5.5599
19	1.0994	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	4.3157	6.1159
20	1.1049	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	4.6610	6.7275
21	1.1104	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	5.8338	7.4002
22	1.1160	1.2447	1.5460	1.9161	2.3699	2.9253	3.6035	5.4368	8.1403
23	1.1216	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	5.8715	8.9543
24	1.1272	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	6.3412	9.8497
25	1.1328	1.2824	2.6406	2.0938	2.6658	3.3864	4.2919	6.8485	10.8347
26	1.1385	1.2953	1.6734	2.1566	2.7725	3.5557	4.5494	7.3964	11.9182
27	1.1442	1.3082	1.7069	2.2213	2.8834	3.7335	4.8223	7.9881	13.1010
28	1.1499	1.3213	1.7410	2.2879	2.9987	3.9201	5.1117	8.6271	14.4210
29	1.1556	1.3345	1.7758	2.3566	3.1187	4.1161	5.4184	9.3173	15.8631
30	1.1614	1.3478	1.8114	2.4273	3.2334	4.3219	5.7435	10.0627	17.4494
31	1.1672	1.3613	1.8476	2.5001	3.3731	4.5380	6.0881	10.8677	19.1943
32	1.1730	1.3749	1.8845	2.5751	3.5081	4.7649	6.4534	11.7371	21.1138
33	1.1789	1.3887	1.9222	2.6523	3.6484	5.0032	6.8406	12.6760	23.2252
34	1.1848	1.4026	1.9607	2.7319	3.7943	5.2533	7.2510	13.6901	25.5477
35	1.1907	1.4166	1.9999	2.8139	3.9461	5.5160	7.6861	14.7853	28.1024
36	1.1967	1.4308	2.0399	2.8983	4.1039	5.7918	8.1473	15.9682	30.9127
37	1.2027	1.4451	2.0807	2.9852	4.2681	6.0814	8.6361	17.2456	34.0039
38	1.2087	1.4595	2.1223	3.0748	4.4388	6.3855	9.1543	18.6252	37.4043
39	1.2147	1.4741	2.1647	3.1670	4.6164	6.7048	9.7035	20.1153	41.1448
40	1.2208	1.4889	2.2080	3.2620	4.8010	7.0400	10.2857	21.7245	45.2593
41	1.2269	1.5038	2.2522	3.3599	4.9931	7.3920	10.9029	23.4625	49.7852
42	1.2330	1.5188	2.2972	3.4607	5.1928	7.7616	11.5570	25.3395	54.7637
43	1.2392	1.5340	2.3432	3.5645	5.4005	8.1497	12.2505	27.3666	60.2401
44	1.2454	1.5493	2.3901	3.6715	5.6665	8.5572	12.9855	29.5560	66.2641
45	1.2516	1.5648	2.4379	3.7816	5.8412	8.9850	13.7647	31.9204	72.8905
46	1.2579	1.5805	2.4866	3.8950	6.0748	9.4343	14.5905	34.4741	80.1795
47	1.2642	1.5963	2.5363	4.0119	6.3178	9.9060	15.4659	37.2320	88.1975
48	1.2705	1.6122	2.5871	4.1323	6.5705	10.4013	16.3938	40.2106	97.0172
49	1.2768	1.6283	2.6388	4.2562	6.8333	10.9213	17.3775	43.4274	106.7190
50	1.2832	1.6446	2.6916	4.3839	7.1067	11.4674	18.4202	46.9016	117.3909

Table 6 Present value of \$1 to be received  $n$  periods hence at compound interest at rate  $j$  per period:  $(1 + j)^{-n}$

$n$	$\frac{1}{2}\%$	1%	2%	3%	4%	5%	6%	8%	10%
1	0.9950	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9259	0.9091
2	0.9901	0.9803	0.9612	0.9226	0.9426	0.9070	0.8900	0.8573	0.8264
3	0.9851	0.9706	0.9423	0.9151	0.8890	0.8238	0.8396	0.7938	0.7513
4	0.9802	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7350	0.6380
5	0.9754	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.6806	0.6209
6	0.9705	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6302	0.5645
7	0.9657	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.5835	0.5132
8	0.9609	0.9235	0.8535	0.7894	0.7307	0.6768	0.2674	0.5403	0.4665
9	0.9561	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5002	0.4241
10	0.9513	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.4632	0.3855
11	0.9466	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4289	0.3505
12	0.9419	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.3971	0.3186
13	0.9372	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.3677	0.2897
14	0.9326	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3405	0.2633
15	0.9279	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3152	0.2394
16	0.9233	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.2919	0.2176
17	0.9187	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.2703	0.1978
18	0.9141	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2502	0.1799
19	0.9096	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2317	0.1635
20	0.9051	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2145	0.1486
21	0.9006	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.1987	0.1351
22	0.8961	0.8304	0.6468	0.5219	0.4220	0.3418	0.2775	0.1839	0.1228
23	0.8916	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.1703	0.1117
24	0.8872	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1577	0.1051
25	0.8828	0.7798	0.6095	0.4776	0.3715	0.2953	0.2330	0.1460	0.0923
26	0.8784	0.7720	0.5976	0.4637	0.3607	0.2812	0.2198	0.1352	0.0839
27	0.8740	0.7644	0.5859	0.4502	0.3468	0.2678	0.2074	0.1252	0.0763
28	0.8697	0.7568	0.5744	0.4371	0.3335	0.2551	0.1956	0.1159	0.0693
29	0.8653	0.7493	0.5631	0.4243	0.3207	0.2429	0.1846	0.1073	0.0630
30	0.8610	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.0994	0.0573
31	0.8567	0.7346	0.5412	0.4000	0.2965	0.2204	0.1643	0.0920	0.0521
32	0.8525	0.7273	0.5306	0.3883	0.2851	0.2099	0.1880	0.0852	0.0474
33	0.8482	0.7201	0.5202	0.3770	0.2741	0.1999	0.1462	0.0789	0.0431
34	0.8440	0.7130	0.5100	0.3660	0.2636	0.1904	0.1397	0.0730	0.0391
35	0.8398	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0676	0.0356
36	0.8356	0.6989	0.4902	0.3450	0.2437	0.1727	0.1227	0.0626	0.0323
37	0.8315	0.6920	0.4806	0.3350	0.2343	0.1644	0.1158	0.0580	0.0294
38	0.8274	0.6852	0.4712	0.3252	0.2253	0.1566	0.1092	0.0537	0.0267
39	0.8232	0.6784	0.4619	0.3158	0.2166	0.1491	0.1031	0.0497	0.0243
40	0.8191	0.6717	0.4529	0.3066	0.2083	0.1420	0.0972	0.0460	0.0221
41	0.8151	0.6650	0.4440	0.2976	0.2003	0.1353	0.0912	0.0426	0.0201
42	0.8110	0.6584	0.4353	0.2890	0.1926	0.1288	0.0865	0.0395	0.0183
43	0.8070	0.6519	0.4268	0.2805	0.1852	0.1227	0.0816	0.0365	0.0166
44	0.8030	0.6454	0.4184	0.2724	0.1780	0.1169	0.0770	0.0338	0.0151
45	0.7990	0.6391	0.4102	0.2644	0.1712	0.1113	0.0727	0.0313	0.0137
46	0.7950	0.6327	0.4022	0.2567	0.1646	0.1060	0.0685	0.0290	0.0125
47	0.7910	0.6265	0.3943	0.2493	0.1583	0.1009	0.0647	0.0269	0.0113
48	0.7871	0.6203	0.3865	0.2420	0.1522	0.0961	0.0610	0.0249	0.0103
49	0.7832	0.6141	0.3790	0.2350	0.1463	0.0916	0.0575	0.0230	0.0094
50	0.7793	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0213	0.0085

Table 7 Amount of an annuity of \$1 per period,  $n$  periods hence, at rate  $j$  per period:  $[(1 + j)^n - 1]/j$

$n$	$\frac{1}{2}\%$	1%	2%	3%	4%	5%	6%	8%	10%
1	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0050	2.0100	2.0200	2.0300	2.0400	2.0500	2.0600	2.0800	2.1000
3	3.0150	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2464	3.3100
4	4.0301	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.5061	4.6410
5	5.0503	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.8666	6.1051
6	6.0755	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.3359	7.7156
7	7.1059	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.9228	9.4872
8	8.1414	8.2857	8.5830	8.8923	9.2142	9.5491	9.8975	10.6366	11.4359
9	9.1821	9.3685	9.7546	10.1591	10.5828	11.0266	11.4913	12.4876	13.5795
10	10.2280	10.4622	10.9497	11.4639	12.0061	12.5779	13.1808	14.4855	15.9374
11	11.2792	11.5668	12.1687	12.8078	13.4864	14.2068	14.9716	16.6455	18.5312
12	12.3356	12.6825	13.4121	14.1920	15.0258	15.9171	16.8699	18.9771	21.3843
13	13.3972	13.8093	14.6803	15.6178	16.6268	17.7130	18.8821	21.4953	24.5227
14	14.4642	14.9474	15.9739	17.0863	18.2919	19.5986	21.0151	24.2149	27.9750
15	15.5365	16.0969	17.2934	18.5989	20.0236	21.5786	23.2760	27.1521	31.7725
16	16.6142	17.2579	18.6393	20.1569	21.8245	23.6575	25.6725	30.3243	35.9497
17	17.6973	18.4304	20.0121	21.7616	23.6975	25.8404	28.2129	33.7502	40.5447
18	18.7858	19.6147	21.4123	23.4144	25.6454	28.1324	30.9057	37.4502	45.5992
19	19.8797	20.8109	22.8406	25.1169	27.6712	30.5390	33.7600	41.4463	51.1591
20	20.9791	22.0190	24.2974	26.8704	29.7781	33.0660	36.7856	45.7620	57.2750
21	22.0840	23.2392	25.7833	28.6765	31.9692	35.7193	39.9927	50.4229	64.0025
22	23.1944	24.4716	27.2990	30.5368	34.2480	38.5052	43.3923	55.4568	71.4027
23	24.3104	25.7163	28.8450	32.4529	36.6179	41.4305	46.9958	60.8933	79.5430
24	25.4320	26.9735	30.4219	34.4265	39.0826	44.5020	50.8156	66.7648	88.4973
25	26.5591	28.2432	32.0303	36.4593	41.6459	47.7271	54.8645	73.1059	98.3471
26	27.6919	29.5256	33.6709	38.5530	44.3117	51.1135	59.1564	79.9544	109.1818
27	28.8304	30.8209	35.3443	40.7096	47.0842	54.6691	63.7058	87.3508	121.0999
28	29.9745	32.1291	37.0512	42.9309	49.9676	58.4026	68.5281	95.3388	134.2099
29	31.1244	33.4504	38.7922	45.2189	52.9663	62.3227	73.6398	103.9659	148.6309
30	32.2800	34.7849	40.5681	47.5754	56.0849	66.4388	79.0582	113.2832	164.4940
31	33.4414	36.1327	42.3794	50.0027	59.3283	70.7608	84.8017	123.3459	181.9434
32	34.6086	37.4941	44.2270	52.5028	62.7015	75.2988	90.8898	134.2135	201.1378
33	35.7817	38.8690	46.1116	55.0278	66.2095	80.0638	97.3432	145.9506	222.2515
34	36.9606	40.2577	48.0338	57.7302	69.8579	85.0670	104.1838	158.6267	245.4767
35	38.1454	41.6603	49.9945	60.4621	73.6522	90.3203	111.4348	172.3168	271.0244
36	39.3361	43.0769	51.9944	63.2759	77.5983	95.8363	119.1209	187.1021	299.1268
37	40.5328	44.5076	54.0343	66.1742	81.7022	101.6281	127.2681	203.0703	330.0395
38	41.7355	45.9527	56.1149	69.1594	85.9703	107.7095	135.9042	220.3159	364.0434
39	42.9441	47.4123	58.2372	72.2342	90.4091	114.0950	143.0585	238.9412	401.4478
40	44.1589	48.8864	60.4020	75.4013	95.0255	120.7998	154.7620	259.0565	442.5926
41	45.3796	50.3752	62.6100	78.6633	99.8265	127.8398	165.0477	280.7810	487.8518
42	46.6065	51.8790	64.8622	82.0232	104.8196	135.2318	175.9505	304.2435	537.6370
43	47.8396	53.3978	67.1595	85.4839	110.0124	142.9933	187.5076	329.5830	592.4007
44	49.0788	54.9318	69.5027	89.0484	115.4129	151.1430	199.7580	356.9496	652.6408
45	50.3242	56.4811	71.8927	92.7199	121.0294	159.7002	212.7435	386.5056	718.9049
46	51.5758	58.0459	74.3306	96.5018	126.8706	168.6852	226.5081	418.4261	791.7953
47	52.8337	59.6263	76.8172	100.3965	132.9454	178.1194	241.0986	452.9002	871.9749
48	54.0978	61.2226	79.3539	104.4084	139.2632	188.0254	256.5645	490.1322	960.1723
49	55.3683	62.8348	81.9406	108.5406	145.8337	198.4267	272.9584	530.3427	1057.1896
50	56.6452	64.4632	84.5794	112.7969	152.6671	209.3480	290.3359	573.7702	1163.9085

**Table 8 Present value of an annuity of \$1 per period for  $n$  periods at interest rate  $j$  per period:  $[1 - (1 + j)^{-n}]/j$**

$n$	$\frac{1}{2}\%$	1%	2%	3%	4%	5%	6%	8%	10%
1	0.9950	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9259	<b>0.9091</b>
2	1.9851	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.7833	<b>1.7355</b>
3	2.9702	2.9410	2.8839	2.8286	2.7751	2.7232	2.6730	2.5771	<b>2.4869</b>
4	3.9505	3.9020	3.8077	3.7171	3.6299	3.5460	3.4651	3.3121	<b>3.1699</b>
5	4.9259	4.8534	4.7135	4.4797	4.4518	4.3295	4.2124	3.9927	<b>3.7908</b>
6	5.8964	5.7955	5.6014	5.4172	5.2421	5.0757	4.9173	4.6229	<b>4.3553</b>
7	6.8621	6.4720	6.2303	6.2303	6.0021	5.7864	5.5824	5.2064	<b>4.8684</b>
8	7.8230	7.6517	7.3255	7.0197	6.7327	6.4632	6.2098	5.7466	<b>5.3349</b>
9	8.7791	8.5660	8.1622	7.7861	7.4353	7.1078	6.8017	6.2469	<b>5.7590</b>
10	9.7304	9.4713	8.9826	8.5302	8.1109	7.7217	7.3601	6.7101	<b>6.1446</b>
11	10.6770	10.3676	9.7868	9.2526	8.7605	8.3064	7.8869	7.1390	<b>6.4951</b>
12	11.6189	11.2551	10.5753	9.9540	9.3851	8.9388	8.3838	7.5361	<b>6.8137</b>
13	12.5562	12.1337	11.3484	10.6350	9.9856	9.3936	8.8527	7.9038	<b>7.1034</b>
14	13.4887	13.0037	12.1062	11.2961	10.5631	9.8986	9.2950	8.2442	<b>7.3667</b>
15	14.4166	13.8651	12.8493	11.9379	11.1184	10.3797	9.7122	8.5595	<b>7.6061</b>
16	15.3399	14.7179	13.5777	12.5611	11.6523	10.8378	10.1059	8.8514	<b>7.8237</b>
17	16.2586	15.5623	14.2919	13.1661	12.1657	11.2741	10.4773	9.1216	<b>8.0216</b>
18	17.1728	16.3983	14.9920	13.7535	12.6593	11.6896	10.8267	9.3719	<b>8.2014</b>
19	18.0824	17.2260	15.6785	14.3238	13.1339	12.0853	11.1581	9.6036	<b>8.3649</b>
20	18.9874	18.0456	16.3514	14.8775	13.5903	12.4622	11.4699	9.8181	<b>8.5136</b>
21	19.8880	18.8570	17.0112	15.4150	14.0292	12.8212	11.7641	10.0168	<b>8.6487</b>
22	20.7841	19.6604	17.6580	15.9369	14.4511	13.1630	12.0416	10.2007	<b>8.7715</b>
23	21.6757	20.4558	18.2922	16.4436	14.8568	13.4886	12.3034	10.3711	<b>8.8832</b>
24	22.5629	21.2434	18.9139	16.9355	15.2470	13.7986	12.5504	10.5288	<b>8.9847</b>
25	23.4456	22.0232	19.5235	17.4131	15.6221	14.0939	12.7834	10.6748	<b>9.0770</b>
26	24.3240	22.7952	20.1201	17.8768	15.9828	14.3752	13.0032	10.8100	<b>9.1609</b>
27	25.1980	23.5596	20.7069	18.3270	16.3296	14.6430	13.2105	10.9352	<b>9.2372</b>
28	26.0677	24.3164	21.2813	18.7641	16.6631	14.8981	13.4062	11.0511	<b>9.3066</b>
29	26.9330	25.0658	21.8444	19.1885	16.9837	15.1411	13.5907	11.1584	<b>9.3696</b>
30	27.7941	25.8077	22.3965	19.6004	17.2920	15.3725	13.7648	11.2578	<b>9.4269</b>
31	28.6508	26.5423	22.9377	20.0004	17.5885	15.5928	13.9291	11.3498	<b>9.4790</b>
32	29.5033	27.2696	23.4683	20.3888	17.8736	15.8027	14.0840	11.4350	<b>9.5264</b>
33	30.3515	27.9897	23.9886	20.7658	18.1476	16.0025	14.2302	11.5139	<b>9.5694</b>
34	31.1956	28.7027	24.4986	21.1318	18.4112	16.1929	14.3681	11.5869	<b>9.6086</b>
35	32.0354	29.4086	24.9986	21.4872	18.6646	16.3742	14.4982	11.6546	<b>9.6442</b>
36	32.8710	30.1075	25.4888	21.8323	18.9083	16.5469	14.6210	11.7172	<b>9.6765</b>
37	33.7025	30.7995	25.9695	22.1672	19.1426	16.7113	14.7368	11.7752	<b>9.7059</b>
38	34.5299	31.4847	26.4406	22.4925	19.3679	16.8679	14.8460	11.8289	<b>9.7327</b>
39	35.3531	32.1630	26.9026	22.8082	19.5845	17.0170	14.9491	11.8786	<b>9.7570</b>
40	36.1722	32.8347	27.3555	23.1148	19.7928	17.1591	15.0463	11.9246	<b>9.7791</b>
41	36.9873	33.4997	27.7995	23.4124	19.9931	17.2944	15.1380	11.9672	<b>9.7991</b>
42	37.7983	34.1581	28.2348	23.7014	20.1856	17.4232	15.2245	12.0067	<b>9.8174</b>
43	38.6053	34.8100	28.6616	23.9819	20.3708	17.5459	15.3062	12.0432	<b>9.8340</b>
44	39.4082	38.4555	29.0800	24.2543	20.5488	17.6628	15.3832	12.0771	<b>9.8491</b>
45	40.2072	36.0945	29.4902	24.5187	20.7200	17.7741	15.4558	12.1084	<b>9.8628</b>
46	41.0022	36.7272	29.8923	24.7754	20.8847	17.8801	15.5244	12.1374	<b>9.8753</b>
47	41.7932	37.3537	30.2866	25.0247	21.0429	17.9810	15.5890	12.1643	<b>9.8866</b>
48	42.5803	37.9740	30.6731	25.2667	21.1951	18.0772	15.6500	12.1891	<b>9.8969</b>
49	43.3635	38.5881	31.0521	25.5017	21.3415	18.1687	15.7076	12.2122	<b>9.9063</b>
50	44.1428	39.1961	31.4236	25.7298	21.4822	18.2559	15.7619	12.2335	<b>9.9148</b>