Appendix

C

Statistical Tables

Note: The following tables are on the Web site of the text along with Chapters 14 and 15.

Table I Table of Binomial Probabilities

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
1	0	.9500	.9000	.8000	.7000	.6000	.5000	.4000	.3000	.2000	.1000	.0500
	1	.0500	.1000	.2000	.3000	.4000	.5000	.6000	.7000	.8000	.9000	.9500
2	0	.9025	.8100	.6400	.4900	.3600	.2500	.1600	.0900	.0400	.0100	.0025
	1	.0950	.1800	.3200	.4200	.4800	.5000	.4800	.4200	.3200	.1800	.0950
	2	.0025	.0100	.0400	.0900	.1600	.2500	.3600	.4900	.6400	.8100	.9025
3	0	.8574	.7290	.5120	.3430	.2160	.1250	.0640	.0270	.0080	.0010	.0001
	1	.1354	.2430	.3840	.4410	.4320	.3750	.2880	.1890	.0960	.0270	.0071
	2	.0071	.0270	.0960	.1890	.2880	.3750	.4320	.4410	.3840	.2430	.1354
	3	.0001	.0010	.0080	.0270	.0640	.1250	.2160	.3430	.5120	.7290	.8574
4	0	.8145	.6561	.4096	.2401	.1296	.0625	.0256	.0081	.0016	.0001	.0000
	1	.1715	.2916	.4096	.4116	.3456	.2500	.1536	.0756	.0256	.0036	.0005
	2	.0135	.0486	.1536	.2646	.3456	.3750	.3456	.2646	.1536	.0486	.0135
	3	.0005	.0036	.0256	.0756	.1536	.2500	.3456	.4116	.4096	.2916	.1715
	4	.0000	.0001	.0016	.0081	.0256	.0625	.1296	.2401	.4096	.6561	.8145
5	0	.7738	.5905	.3277	.1681	.0778	.0312	.0102	.0024	.0003	.0000	.0000
	1	.2036	.3280	.4096	.3602	.2592	.1562	.0768	.0284	.0064	.0005	.0000
	2	.0214	.0729	.2048	.3087	.3456	.3125	.2304	.1323	.0512	.0081	.0011
	3	.0011	.0081	.0512	.1323	.2304	.3125	.3456	.3087	.2048	.0729	.0214
	4	.0000	.0004	.0064	.0283	.0768	.1562	.2592	.3601	.4096	.3281	.2036
	5	.0000	.0000	.0003	.0024	.0102	.0312	.0778	.1681	.3277	.5905	.7738
6	0	.7351	.5314	.2621	.1176	.0467	.0156	.0041	.0007	.0001	.0000	.0000
	1	.2321	.3543	.3932	.3025	.1866	.0937	.0369	.0102	.0015	.0001	.0000
	2	.0305	.0984	.2458	.3241	.3110	.2344	.1382	.0595	.0154	.0012	.0001
	3	.0021	.0146	.0819	.1852	.2765	.3125	.2765	.1852	.0819	.0146	.0021
	4	.0001	.0012	.0154	.0595	.1382	.2344	.3110	.3241	.2458	.0984	.0305
	5	.0000	.0001	.0015	.0102	.0369	.0937	.1866	.3025	.3932	.3543	.2321
	6	.0000	.0000	.0001	.0007	.0041	.0156	.0467	.1176	.2621	.5314	.7351
7	0	.6983	.4783	.2097	.0824	.0280	.0078	.0016	.0002	.0000	.0000	.0000
	1	.2573	.3720	.3670	.2471	.1306	.0547	.0172	.0036	.0004	.0000	.0000
	2	.0406	.1240	.2753	.3177	.2613	.1641	.0774	.0250	.0043	.0002	.0000
	3	.0036	.0230	.1147	.2269	.2903	.2734	.1935	.0972	.0287	.0026	.0002
	4	.0002	.0026	.0287	.0972	.1935	.2734	.2903	.2269	.1147	.0230	.0036
	5	.0000	.0002	.0043	.0250	.0774	.1641	.2613	.3177	.2753	.1240	.0406
	6	.0000	.0000	.0004	.0036	.0172	.0547	.1306	.2471	.3670	.3720	.2573
	7	.0000	.0000	.0000	.0002	.0016	.0078	.0280	.0824	.2097	.4783	.6983
8	0	.6634	.4305	.1678	.0576	.0168	.0039	.0007	.0001	.0000	.0000	.0000
	1	.2793	.3826	.3355	.1977	.0896	.0312	.0079	.0012	.0001	.0000	.0000

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	2	.0515	.1488	.2936	.2965	.2090	.1094	.0413	.0100	.0011	.0000	.0000
	3	.0054	.0331	.1468	.2541	.2787	.2187	.1239	.0467	.0092	.0004	.0000
	4	.0004	.0046	.0459	.1361	.2322	.2734	.2322	.1361	.0459	.0046	.0004
	5	.0000	.0004	.0092	.0467	.1239	.2187	.2787	.2541	.1468	.0331	.0054
	6	.0000	.0000	.0011	.0100	.0413	.1094	.2090	.2965	.2936	.1488	.0515
	7	.0000	.0000	.0001	.0012	.0079	.0312	.0896	.1977	.3355	.3826	.2793
	8	.0000	.0000	.0000	.0001	.0007	.0039	.0168	.0576	.1678	.4305	.6634
9	0	.6302	.3874	.1342	.0404	.0101	.0020	.0003	.0000	.0000	.0000	.0000
	1	.2985	.3874	.3020	.1556	.0605	.0176	.0035	.0004	.0000	.0000	.0000
	2	.0629	.1722	.3020	.2668	.1612	.0703	.0212	.0039	.0003	.0000	.0000
	3	.0077	.0446	.1762	.2668	.2508	.1641	.0743	.0210	.0028	.0001	.0000
	4	.0006	.0074	.0661	.1715	.2508	.2461	.1672	.0735	.0165	.0008	.0000
	5	.0000	.0008	.0165	.0735	.1672	.2461	.2508	.1715	.0661	.0074	.0006
	6	.0000	.0001	.0028	.0210	.0743	.1641	.2508	.2668	.1762	.0446	.0077
	7	.0000	.0000	.0003	.0039	.0212	.0703	.1612	.2668	.3020	.1722	.0629
	8	.0000	.0000	.0000	.0004	.0035	.0176	.0605	.1556	.3020	.3874	.2985
	9	.0000	.0000	.0000	.0000	.0003	.0020	.0101	.0404	.1342	.3874	.6302
10	0	.5987	.3487	.1074	.0282	.0060	.0010	.0001	.0000	.0000	.0000	.0000
	1	.3151	.3874	.2684	.1211	.0403	.0098	.0016	.0001	.0000	.0000	.0000
	2	.0746	.1937	.3020	.2335	.1209	.0439	.0106	.0014	.0001	.0000	.0000
	3	.0105	.0574	.2013	.2668	.2150	.1172	.0425	.0090	.0008	.0000	.0000
	4	.0010	.0112	.0881	.2001	.2508	.2051	.1115	.0368	.0055	.0001	.0000
	5	.0001	.0015	.0264	.1029	.2007	.2461	.2007	.1029	.0264	.0015	.0001
	6	.0000	.0001	.0055	.0368	.1115	.2051	.2508	.2001	.0881	.0112	.0010
	7	.0000	.0000	.0008	.0090	.0425	.1172	.2150	.2668	.2013	.0574	.0105
	8	.0000	.0000	.0001	.0014	.0106	.0439	.1209	.2335	.3020	.1937	.0746
	9	.0000	.0000	.0000	.0001	.0016	.0098	.0403	.1211	.2684	.3874	.3151
	10	.0000	.0000	.0000	.0000	.0001	.0010	.0060	.0282	.1074	.3487	.5987
11	0	.5688	.3138	.0859	.0198	.0036	.0005	.0000	.0000	.0000	.0000	.0000
	1	.3293	.3835	.2362	.0932	.0266	.0054	.0007	.0000	.0000	.0000	.0000
	2	.0867	.2131	.2953	.1998	.0887	.0269	.0052	.0005	.0000	.0000	.0000
	3	.0137	.0710	.2215	.2568	.1774	.0806	.0234	.0037	.0002	.0000	.0000
	4	.0014	.0158	.1107	.2201	.2365	.1611	.0701	.0173	.0017	.0000	.0000
	5	.0001	.0025	.0388	.1321	.2207	.2256	.1471	.0566	.0097	.0003	.0000
	6	.0000	.0003	.0097	.0566	.1471	.2256	.2207	.1321	.0388	.0025	.0001
	7	.0000	.0000	.0017	.0173	.0701	.1611	.2365	.2201	.1107	.0158	.0014
	8	.0000	.0000	.0002	.0037	.0234	.0806	.1774	.2568	.2215	.0710	.0137
	9	.0000	.0000	.0000	.0005	.0052	.0269	.0887	.1998	.2953	.2131	.0867

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	10	.0000	.0000	.0000	.0000	.0007	.0054	.0266	.0932	.2362	.3835	.3293
	11	.0000	.0000	.0000	.0000	.0000	.0005	.0036	.0198	.0859	.3138	.5688
12	0	.5404	.2824	.0687	.0138	.0022	.0002	.0000	.0000	.0000	.0000	.0000
	1	.3413	.3766	.2062	.0712	.0174	.0029	.0003	.0000	.0000	.0000	.0000
	2	.0988	.2301	.2835	.1678	.0639	.0161	.0025	.0002	.0000	.0000	.0000
	3	.0173	.0852	.2362	.2397	.1419	.0537	.0125	.0015	.0001	.0000	.0000
	4	.0021	.0213	.1329	.2311	.2128	.1208	.0420	.0078	.0005	.0000	.0000
	5	.0002	.0038	.0532	.1585	.2270	.1934	.1009	.0291	.0033	.0000	.0000
	6	.0000	.0005	.0155	.0792	.1766	.2256	.1766	.0792	.0155	.0005	.0000
	7	.0000	.0000	.0033	.0291	.1009	.1934	.2270	.1585	.0532	.0038	.0002
	8	.0000	.0000	.0005	.0078	.0420	.1208	.2128	.2311	.1329	.0213	.0021
	9	.0000	.0000	.0001	.0015	.0125	.0537	.1419	.2397	.2362	.0852	.0173
	10	.0000	.0000	.0000	.0002	.0025	.0161	.0639	.1678	.2835	.2301	.0988
	11	.0000	.0000	.0000	.0000	.0003	.0029	.0174	.0712	.2062	.3766	.3413
	12	.0000	.0000	.0000	.0000	.0000	.0002	.0022	.0138	.0687	.2824	.5404
13	0	.5133	.2542	.0550	.0097	.0013	.0001	.0000	.0000	.0000	.0000	.0000
	1	.3512	.3672	.1787	.0540	.0113	.0016	.0001	.0000	.0000	.0000	.0000
	2	.1109	.2448	.2680	.1388	.0453	.0095	.0012	.0001	.0000	.0000	.0000
	3	.0214	.0997	.2457	.2181	.1107	.0349	.0065	.0006	.0000	.0000	.0000
	4	.0028	.0277	.1535	.2337	.1845	.0873	.0243	.0034	.0001	.0000	.0000
	5	.0003	.0055	.0691	.1803	.2214	.1571	.0656	.0142	.0011	.0000	.0000
	6	.0000	.0008	.0230	.1030	.1968	.2095	.1312	.0442	.0058	.0001	.0000
	7	.0000	.0001	.0058	.0442	.1312	.2095	.1968	.1030	.0230	.0008	.0000
	8	.0000	.0000	.0011	.0142	.0656	.1571	.2214	.1803	.0691	.0055	.0003
	9	.0000	.0000	.0001	.0034	.0243	.0873	.1845	.2337	.1535	.0277	.0028
	10	.0000	.0000	.0000	.0006	.0065	.0349	.1107	.2181	.2457	.0997	.0214
	11	.0000	.0000	.0000	.0001	.0012	.0095	.0453	.1388	.2680	.2448	.1109
	12	.0000	.0000	.0000	.0000	.0001	.0016	.0113	.0540	.1787	.3672	.3512
	13	.0000	.0000	.0000	.0000	.0000	.0001	.0013	.0097	.0550	.2542	.5133
14	0	.4877	.2288	.0440	.0068	.0008	.0001	.0000	.0000	.0000	.0000	.0000
	1	.3593	.3559	.1539	.0407	.0073	.0009	.0001	.0000	.0000	.0000	.0000
	2	.1229	.2570	.2501	.1134	.0317	.0056	.0005	.0000	.0000	.0000	.0000
	3	.0259	.1142	.2501	.1943	.0845	.0222	.0033	.0002	.0000	.0000	.0000
	4	.0037	.0349	.1720	.2290	.1549	.0611	.0136	.0014	.0000	.0000	.0000
	5	.0004	.0078	.0860	.1963	.2066	.1222	.0408	.0066	.0003	.0000	.0000
	6	.0000	.0013	.0322	.1262	.2066	.1833	.0918	.0232	.0020	.0000	.0000
	7	.0000	.0002	.0092	.0618	.1574	.2095	.1574	.0618	.0092	.0002	.0000
	8	.0000	.0000	.0020	.0232	.0918	.1833	.2066	.1262	.0322	.0013	.0000
	9	.0000	.0000	.0003	.0066	.0408	.1222	.2066	.1963	.0860	.0078	.0004
	10	.0000	.0000	.0000	.0014	.0136	.0611	.1549	.2290	.1720	.0349	.0037

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	11	.0000	.0000	.0000	.0002	.0033	.0222	.0845	.1943	.2501	.1142	.0259
	12	.0000	.0000	.0000	.0000	.0005	.0056	.0317	.1134	.2501	.2570	.1229
	13	.0000	.0000	.0000	.0000	.0001	.0009	.0073	.0407	.1539	.3559	.3593
	14	.0000	.0000	.0000	.0000	.0000	.0001	.0008	.0068	.0440	.2288	.4877
15	0	.4633	.2059	.0352	.0047	.0005	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3658	.3432	.1319	.0305	.0047	.0005	.0000	.0000	.0000	.0000	.0000
	2	.1348	.2669	.2309	.0916	.0219	.0032	.0003	.0000	.0000	.0000	.0000
	3	.0307	.1285	.2501	.1700	.0634	.0139	.0016	.0001	.0000	.0000	.0000
	4	.0049	.0428	.1876	.2186	.1268	.0417	.0074	.0006	.0000	.0000	.0000
	5	.0006	.0105	.1032	.2061	.1859	.0916	.0245	.0030	.0001	.0000	.0000
	6	.0000	.0019	.0430	.1472	.2066	.1527	.0612	.0116	.0007	.0000	.0000
	7	.0000	.0003	.0138	.0811	.1771	.1964	.1181	.0348	.0035	.0000	.0000
	8	.0000	.0000	.0035	.0348	.1181	.1964	.1771	.0811	.0138	.0003	.0000
	9	.0000	.0000	.0007	.0116	.0612	.1527	.2066	.1472	.0430	.0019	.0000
	10	.0000	.0000	.0001	.0030	.0245	.0916	.1859	.2061	.1032	.0105	.0006
	11	.0000	.0000	.0000	.0006	.0074	.0417	.1268	.2186	.1876	.0428	.0049
	12	.0000	.0000	.0000	.0001	.0016	.0139	.0634	.1700	.2501	.1285	.0307
	13	.0000	.0000	.0000	.0000	.0003	.0032	.0219	.0916	.2309	.2669	.1348
	14	.0000	.0000	.0000	.0000	.0000	.0005	.0047	.0305	.1319	.3432	.3658
	15	.0000	.0000	.0000	.0000	.0000	.0000	.0005	.0047	.0352	.2059	.4633
16	0	.4401	.1853	.0281	.0033	.0003	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3706	.3294	.1126	.0228	.0030	.0002	.0000	.0000	.0000	.0000	.0000
	2	.1463	.2745	.2111	.0732	.0150	.0018	.0001	.0000	.0000	.0000	.0000
	3	.0359	.1423	.2463	.1465	.0468	.0085	.0008	.0000	.0000	.0000	.0000
	4	.0061	.0514	.2001	.2040	.1014	.0278	.0040	.0002	.0000	.0000	.0000
	5	.0008	.0137	.1201	.2099	.1623	.0667	.0142	.0013	.0000	.0000	.0000
	6	.0001	.0028	.0550	.1649	.1983	.1222	.0392	.0056	.0002	.0000	.0000
	7	.0000	.0004	.0197	.1010	.1889	.1746	.0840	.0185	.0012	.0000	.0000
	8	.0000	.0001	.0055	.0487	.1417	.1964	.1417	.0487	.0055	.0001	.0000
	9	.0000	.0000	.0012	.0185	.0840	.1746	.1889	.1010	.0197	.0004	.0000
	10	.0000	.0000	.0002	.0056	.0392	.1222	.1983	.1649	.0550	.0028	.0001
	11	.0000	.0000	.0000	.0013	.0142	.0666	.1623	.2099	.1201	.0137	.0008
	12	.0000	.0000	.0000	.0002	.0040	.0278	.1014	.2040	.2001	.0514	.0061
	13	.0000	.0000	.0000	.0000	.0008	.0085	.0468	.1465	.2463	.1423	.0359
	14	.0000	.0000	.0000	.0000	.0001	.0018	.0150	.0732	.2111	.2745	.1463
	15	.0000	.0000	.0000	.0000	.0000	.0002	.0030	.0228	.1126	.3294	.3706
	16	.0000	.0000	.0000	.0000	.0000	.0000	.0003	.0033	.0281	.1853	.4401
17	0	.4181	.1668	.0225	.0023	.0002	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3741	.3150	.0957	.0169	.0019	.0001	.0000	.0000	.0000	.0000	.0000
	2	.1575	.2800	.1914	.0581	.0102	.0010	.0001	.0000	.0000	.0000	.0000

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	3	.0415	.1556	.2393	.1245	.0341	.0052	.0004	.0000	.0000	.0000	.0000
	4	.0076	.0605	.2093	.1868	.0796	.0182	.0021	.0001	.0000	.0000	.0000
	5	.0010	.0175	.1361	.2081	.1379	.0472	.0081	.0006	.0000	.0000	.0000
	6	.0001	.0039	.0680	.1784	.1839	.0944	.0242	.0026	.0001	.0000	.0000
	7	.0000	.0007	.0267	.1201	.1927	.1484	.0571	.0095	.0004	.0000	.0000
	8	.0000	.0001	.0084	.0644	.1606	.1855	.1070	.0276	.0021	.0000	.0000
	9	.0000	.0000	.0021	.0276	.1070	.1855	.1606	.0644	.0084	.0001	.0000
	10	.0000	.0000	.0004	.0095	.0571	.1484	.1927	.1201	.0267	.0007	.0000
	11	.0000	.0000	.0001	.0026	.0242	.0944	.1839	.1784	.0680	.0039	.0001
	12	.0000	.0000	.0000	.0006	.0081	.0472	.1379	.2081	.1361	.0175	.0010
	13	.0000	.0000	.0000	.0001	.0021	.0182	.0796	.1868	.2093	.0605	.0076
	14	.0000	.0000	.0000	.0000	.0004	.0052	.0341	.1245	.2393	.1556	.0415
	15	.0000	.0000	.0000	.0000	.0001	.0010	.0102	.0581	.1914	.2800	.1575
	16	.0000	.0000	.0000	.0000	.0000	.0001	.0019	.0169	.0957	.3150	.3741
	17	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0023	.0225	.1668	.4181
18	0	.3972	.1501	.0180	.0016	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3763	.3002	.0811	.0126	.0012	.0001	.0000	.0000	.0000	.0000	.0000
	2	.1683	.2835	.1723	.0458	.0069	.0006	.0000	.0000	.0000	.0000	.0000
	3	.0473	.1680	.2297	.1046	.0246	.0031	.0002	.0000	.0000	.0000	.0000
	4	.0093	.0700	.2153	.1681	.0614	.0117	.0011	.0000	.0000	.0000	.0000
	5	.0014	.0218	.1507	.2017	.1146	.0327	.0045	.0002	.0000	.0000	.0000
	6	.0002	.0052	.0816	.1873	.1655	.0708	.0145	.0012	.0000	.0000	.0000
	7	.0000	.0010	.0350	.1376	.1892	.1214	.0374	.0046	.0001	.0000	.0000
	8	.0000	.0002	.0120	.0811	.1734	.1669	.0771	.0149	.0008	.0000	.0000
	9	.0000	.0000	.0033	.0386	.1284	.1855	.1284	.0386	.0033	.0000	.0000
	10	.0000	.0000	.0008	.0149	.0771	.1669	.1734	.0811	.0120	.0002	.0000
	11	.0000	.0000	.0001	.0046	.0374	.1214	.1892	.1376	.0350	.0010	.0000
	12	.0000	.0000	.0000	.0012	.0145	.0708	.1655	.1873	.0816	.0052	.0002
	13	.0000	.0000	.0000	.0002	.0045	.0327	.1146	.2017	.1507	.0218	.0014
	14	.0000	.0000	.0000	.0000	.0011	.0117	.0614	.1681	.2153	.0700	.0093
	15	.0000	.0000	.0000	.0000	.0002	.0031	.0246	.1046	.2297	.1680	.0473
	16	.0000	.0000	.0000	.0000	.0000	.0006	.0069	.0458	.1723	.2835	.1683
	17	.0000	.0000	.0000	.0000	.0000	.0001	.0012	.0126	.0811	.3002	.3763
	18	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0016	.0180	.1501	.3972
19	0	.3774	.1351	.0144	.0011	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3774	.2852	.0685	.0093	.0008	.0000	.0000	.0000	.0000	.0000	.0000
	2	.1787	.2852	.1540	.0358	.0046	.0003	.0000	.0000	.0000	.0000	.0000
	3	.0533	.1796	.2182	.0869	.0175	.0018	.0001	.0000	.0000	.0000	.0000
	4	.0112	.0798	.2182	.1491	.0467	.0074	.0005	.0000	.0000	.0000	.0000

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	5	.0018	.0266	.1636	.1916	.0933	.0222	.0024	.0001	.0000	.0000	.0000
	6	.0002	.0069	.0955	.1916	.1451	.0518	.0085	.0005	.0000	.0000	.0000
	7	.0000	.0014	.0443	.1525	.1797	.0961	.0237	.0022	.0000	.0000	.0000
	8	.0000	.0002	.0166	.0981	.1797	.1442	.0532	.0077	.0003	.0000	.0000
	9	.0000	.0000	.0051	.0514	.1464	.1762	.0976	.0220	.0013	.0000	.0000
	10	.0000	.0000	.0013	.0220	.0976	.1762	.1464	.0514	.0051	.0000	.0000
	11	.0000	.0000	.0003	.0077	.0532	.1442	.1797	.0981	.0166	.0002	.0000
	12	.0000	.0000	.0000	.0022	.0237	.0961	.1797	.1525	.0443	.0014	.0000
	13	.0000	.0000	.0000	.0005	.0085	.0518	.1451	.1916	.0955	.0069	.0002
	14	.0000	.0000	.0000	.0001	.0024	.0222	.0933	.1916	.1636	.0266	.0018
	15	.0000	.0000	.0000	.0000	.0005	.0074	.0467	.1491	.2182	.0798	.0112
	16	.0000	.0000	.0000	.0000	.0001	.0018	.0175	.0869	.2182	.1796	.0533
	17	.0000	.0000	.0000	.0000	.0000	.0003	.0046	.0358	.1540	.2852	.1787
	18	.0000	.0000	.0000	.0000	.0000	.0000	.0008	.0093	.0685	.2852	.3774
	19	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0011	.0144	.1351	.3774
20	0	.3585	.1216	.0115	.0008	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3774	.2702	.0576	.0068	.0005	.0000	.0000	.0000	.0000	.0000	.0000
	2	.1887	.2852	.1369	.0278	.0031	.0002	.0000	.0000	.0000	.0000	.0000
	3	.0596	.1901	.2054	.0716	.0123	.0011	.0000	.0000	.0000	.0000	.0000
	4	.0133	.0898	.2182	.1304	.0350	.0046	.0003	.0000	.0000	.0000	.0000
	5	.0022	.0319	.1746	.1789	.0746	.0148	.0013	.0000	.0000	.0000	.0000
	6	.0003	.0089	.1091	.1916	.1244	.0370	.0049	.0002	.0000	.0000	.0000
	7	.0000	.0020	.0545	.1643	.1659	.0739	.0146	.0010	.0000	.0000	.0000
	8	.0000	.0004	.0222	.1144	.1797	.1201	.0355	.0039	.0001	.0000	.0000
	9	.0000	.0001	.0074	.0654	.1597	.1602	.0710	.0120	.0005	.0000	.0000
	10	.0000	.0000	.0020	.0308	.1171	.1762	.1171	.0308	.0020	.0000	.0000
	11	.0000	.0000	.0005	.0120	.0710	.1602	.1597	.0654	.0074	.0001	.0000
	12	.0000	.0000	.0001	.0039	.0355	.1201	.1797	.1144	.0222	.0004	.0000
	13	.0000	.0000	.0000	.0010	.0146	.0739	.1659	.1643	.0545	.0020	.0000
	14	.0000	.0000	.0000	.0002	.0049	.0370	.1244	.1916	.1091	.0089	.0003
	15	.0000	.0000	.0000	.0000	.0013	.0148	.0746	.1789	.1746	.0319	.0022
	16	.0000	.0000	.0000	.0000	.0003	.0046	.0350	.1304	.2182	.0898	.0133
	17	.0000	.0000	.0000	.0000	.0000	.0011	.0123	.0716	.2054	.1901	.0596
	18	.0000	.0000	.0000	.0000	.0000	.0002	.0031	.0278	.1369	.2852	.1887
	19	.0000	.0000	.0000	.0000	.0000	.0000	.0005	.0068	.0576	.2702	.3774
	20	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0008	.0115	.1216	.3585
21	0	.3406	.1094	.0092	.0006	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3764	.2553	.0484	.0050	.0003	.0000	.0000	.0000	.0000	.0000	.0000
	2	.1981	.2837	.1211	.0215	.0020	.0001	.0000	.0000	.0000	.0000	.0000

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	3	.0660	.1996	.1917	.0585	.0086	.0006	.0000	.0000	.0000	.0000	.0000
	4	.0156	.0998	.2156	.1128	.0259	.0029	.0001	.0000	.0000	.0000	.0000
	5	.0028	.0377	.1833	.1643	.0588	.0097	.0007	.0000	.0000	.0000	.0000
	6	.0004	.0112	.1222	.1878	.1045	.0259	.0027	.0001	.0000	.0000	.0000
	7	.0000	.0027	.0655	.1725	.1493	.0554	.0087	.0005	.0000	.0000	.0000
	8	.0000	.0005	.0286	.1294	.1742	.0970	.0229	.0019	.0000	.0000	.0000
	9	.0000	.0001	.0103	.0801	.1677	.1402	.0497	.0063	.0002	.0000	.0000
	10	.0000	.0000	.0031	.0412	.1342	.1682	.0895	.0176	.0008	.0000	.0000
	11	.0000	.0000	.0008	.0176	.0895	.1682	.1342	.0412	.0031	.0000	.0000
	12	.0000	.0000	.0002	.0063	.0497	.1402	.1677	.0801	.0103	.0001	.0000
	13	.0000	.0000	.0000	.0019	.0229	.0970	.1742	.1294	.0286	.0005	.0000
	14	.0000	.0000	.0000	.0005	.0087	.0554	.1493	.1725	.0655	.0027	.0000
	15	.0000	.0000	.0000	.0001	.0027	.0259	.1045	.1878	.1222	.0112	.0004
	16	.0000	.0000	.0000	.0000	.0007	.0097	.0588	.1643	.1833	.0377	.0028
	17	.0000	.0000	.0000	.0000	.0001	.0029	.0259	.1128	.2156	.0998	.0156
	18	.0000	.0000	.0000	.0000	.0000	.0006	.0086	.0585	.1917	.1996	.0660
	19	.0000	.0000	.0000	.0000	.0000	.0001	.0020	.0215	.1211	.2837	.1981
	20	.0000	.0000	.0000	.0000	.0000	.0000	.0003	.0050	.0484	.2553	.3764
	21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0006	.0092	.1094	.3406
22	0	.3235	.0985	.0074	.0004	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3746	.2407	.0406	.0037	.0002	.0000	.0000	.0000	.0000	.0000	.0000
	2	.2070	.2808	.1065	.0166	.0014	.0001	.0000	.0000	.0000	.0000	.0000
	3	.0726	.2080	.1775	.0474	.0060	.0004	.0000	.0000	.0000	.0000	.0000
	4	.0182	.1098	.2108	.0965	.0190	.0017	.0001	.0000	.0000	.0000	.0000
	5	.0034	.0439	.1898	.1489	.0456	.0063	.0004	.0000	.0000	.0000	.0000
	6	.0005	.0138	.1344	.1808	.0862	.0178	.0015	.0000	.0000	.0000	.0000
	7	.0001	.0035	.0768	.1771	.1314	.0407	.0051	.0002	.0000	.0000	.0000
	8	.0000	.0007	.0360	.1423	.1642	.0762	.0144	.0009	.0000	.0000	.0000
	9	.0000	.0001	.0140	.0949	.1703	.1186	.0336	.0032	.0001	.0000	.0000
	10	.0000	.0000	.0046	.0529	.1476	.1542	.0656	.0097	.0003	.0000	.0000
	11	.0000	.0000	.0012	.0247	.1073	.1682	.1073	.0247	.0012	.0000	.0000
	12	.0000	.0000	.0003	.0097	.0656	.1542	.1476	.0529	.0046	.0000	.0000
	13	.0000	.0000	.0001	.0032	.0336	.1186	.1703	.0949	.0140	.0001	.0000
	14	.0000	.0000	.0000	.0009	.0144	.0762	.1642	.1423	.0360	.0007	.0000
	15	.0000	.0000	.0000	.0002	.0051	.0407	.1314	.1771	.0768	.0035	.0001
	16	.0000	.0000	.0000	.0000	.0015	.0178	.0862	.1808	.1344	.0138	.0005
	17	.0000	.0000	.0000	.0000	.0004	.0063	.0456	.1489	.1898	.0439	.0034
	18	.0000	.0000	.0000	.0000	.0001	.0017	.0190	.0965	.2108	.1098	.0182
	19	.0000	.0000	.0000	.0000	.0000	.0004	.0060	.0474	.1775	.2080	.0726

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	20	.0000	.0000	.0000	.0000	.0000	.0001	.0014	.0166	.1065	.2808	.2070
	21	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0037	.0406	.2407	.3746
	22	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0004	.0074	.0985	.3235
23	0	.3074	.0886	.0059	.0003	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3721	.2265	.0339	.0027	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	2	.2154	.2768	.0933	.0127	.0009	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0794	.2153	.1633	.0382	.0041	.0002	.0000	.0000	.0000	.0000	.0000
	4	.0209	.1196	.2042	.0818	.0138	.0011	.0000	.0000	.0000	.0000	.0000
	5	.0042	.0505	.1940	.1332	.0350	.0040	.0002	.0000	.0000	.0000	.0000
	6	.0007	.0168	.1455	.1712	.0700	.0120	.0008	.0000	.0000	.0000	.0000
	7	.0001	.0045	.0883	.1782	.1133	.0292	.0029	.0001	.0000	.0000	.0000
	8	.0000	.0010	.0442	.1527	.1511	.0584	.0088	.0004	.0000	.0000	.0000
	9	.0000	.0002	.0184	.1091	.1679	.0974	.0221	.0016	.0000	.0000	.0000
	10	.0000	.0000	.0064	.0655	.1567	.1364	.0464	.0052	.0001	.0000	.0000
	11	.0000	.0000	.0019	.0332	.1234	.1612	.0823	.0142	.0005	.0000	.0000
	12	.0000	.0000	.0005	.0142	.0823	.1612	.1234	.0332	.0019	.0000	.0000
	13	.0000	.0000	.0001	.0052	.0464	.1364	.1567	.0655	.0064	.0000	.0000
	14	.0000	.0000	.0000	.0016	.0221	.0974	.1679	.1091	.0184	.0002	.0000
	15	.0000	.0000	.0000	.0004	.0088	.0584	.1511	.1527	.0442	.0010	.0000
	16	.0000	.0000	.0000	.0001	.0029	.0292	.1133	.1782	.0883	.0045	.0001
	17	.0000	.0000	.0000	.0000	.0008	.0120	.0700	.1712	.1455	.0168	.0007
	18	.0000	.0000	.0000	.0000	.0002	.0040	.0350	.1332	.1940	.0505	.0042
	19	.0000	.0000	.0000	.0000	.0000	.0011	.0138	.0818	.2042	.1196	.0209
	20	.0000	.0000	.0000	.0000	.0000	.0002	.0041	.0382	.1633	.2153	.0794
	21	.0000	.0000	.0000	.0000	.0000	.0000	.0009	.0127	.0933	.2768	.2154
	22	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0027	.0339	.2265	.3721
	23	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0003	.0059	.0886	.3074
24	0	.2920	.0798	.0047	.0002	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3688	.2127	.0283	.0020	.0001	.0000	.0000	.0000	.0000	.0000	.0000
	2	.2232	.2718	.0815	.0097	.0006	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0862	.2215	.1493	.0305	.0028	.0001	.0000	.0000	.0000	.0000	.0000
	4	.0238	.1292	.1960	.0687	.0099	.0006	.0000	.0000	.0000	.0000	.0000
	5	.0050	.0574	.1960	.1177	.0265	.0025	.0001	.0000	.0000	.0000	.0000
	6	.0008	.0202	.1552	.1598	.0560	.0080	.0004	.0000	.0000	.0000	.0000
	7	.0001	.0058	.0998	.1761	.0960	.0206	.0017	.0000	.0000	.0000	.0000
	8	.0000	.0014	.0530	.1604	.1360	.0438	.0053	.0002	.0000	.0000	.0000
	9	.0000	.0003	.0236	.1222	.1612	.0779	.0141	.0008	.0000	.0000	.0000
	10	.0000	.0000	.0088	.0785	.1612	.1169	.0318	.0026	.0000	.0000	.0000
	11	.0000	.0000	.0028	.0428	.1367	.1488	.0608	.0079	.0002	.0000	.0000

Table I Table of Binomial Probabilities (continued)

		p										
n	***x***	**.05**	**.10**	**.20**	**.30**	**.40**	**.50**	**.60**	**.70**	**.80**	**.90**	**.95**
	12	.0000	.0000	.0008	.0199	.0988	.1612	.0988	.0199	.0008	.0000	.0000
	13	.0000	.0000	.0002	.0079	.0608	.1488	.1367	.0428	.0028	.0000	.0000
	14	.0000	.0000	.0000	.0026	.0318	.1169	.1612	.0785	.0088	.0000	.0000
	15	.0000	.0000	.0000	.0008	.0141	.0779	.1612	.1222	.0236	.0003	.0000
	16	.0000	.0000	.0000	.0002	.0053	.0438	.1360	.1604	.0530	.0014	.0000
	17	.0000	.0000	.0000	.0000	.0017	.0206	.0960	.1761	.0998	.0058	.0001
	18	.0000	.0000	.0000	.0000	.0004	.0080	.0560	.1598	.1552	.0202	.0008
	19	.0000	.0000	.0000	.0000	.0001	.0025	.0265	.1177	.1960	.0574	.0050
	20	.0000	.0000	.0000	.0000	.0000	.0006	.0099	.0687	.1960	.1292	.0238
	21	.0000	.0000	.0000	.0000	.0000	.0001	.0028	.0305	.1493	.2215	.0862
	22	.0000	.0000	.0000	.0000	.0000	.0000	.0006	.0097	.0815	.2718	.2232
	23	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0020	.0283	.2127	.3688
	24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0002	.0047	.0798	.2920
25	0	.2774	.0718	.0038	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	1	.3650	.1994	.0236	.0014	.0000	.0000	.0000	.0000	.0000	.0000	.0000
	2	.2305	.2659	.0708	.0074	.0004	.0000	.0000	.0000	.0000	.0000	.0000
	3	.0930	.2265	.1358	.0243	.0019	.0001	.0000	.0000	.0000	.0000	.0000
	4	.0269	.1384	.1867	.0572	.0071	.0004	.0000	.0000	.0000	.0000	.0000
	5	.0060	.0646	.1960	.1030	.0199	.0016	.0000	.0000	.0000	.0000	.0000
	6	.0010	.0239	.1633	.1472	.0442	.0053	.0002	.0000	.0000	.0000	.0000
	7	.0001	.0072	.1108	.1712	.0800	.0143	.0009	.0000	.0000	.0000	.0000
	8	.0000	.0018	.0623	.1651	.1200	.0322	.0031	.0001	.0000	.0000	.0000
	9	.0000	.0004	.0294	.1336	.1511	.0609	.0088	.0004	.0000	.0000	.0000
	10	.0000	.0001	.0118	.0916	.1612	.0974	.0212	.0013	.0000	.0000	.0000
	11	.0000	.0000	.0040	.0536	.1465	.1328	.0434	.0042	.0001	.0000	.0000
	12	.0000	.0000	.0012	.0268	.1140	.1550	.0760	.0115	.0003	.0000	.0000
	13	.0000	.0000	.0003	.0115	.0760	.1550	.1140	.0268	.0012	.0000	.0000
	14	.0000	.0000	.0001	.0042	.0434	.1328	.1465	.0536	.0040	.0000	.0000
	15	.0000	.0000	.0000	.0013	.0212	.0974	.1612	.0916	.0118	.0001	.0000
	16	.0000	.0000	.0000	.0004	.0088	.0609	.1511	.1336	.0294	.0004	.0000
	17	.0000	.0000	.0000	.0001	.0031	.0322	.1200	.1651	.0623	.0018	.0000
	18	.0000	.0000	.0000	.0000	.0009	.0143	.0800	.1712	.1108	.0072	.0001
	19	.0000	.0000	.0000	.0000	.0002	.0053	.0442	.1472	.1633	.0239	.0010
	20	.0000	.0000	.0000	.0000	.0000	.0016	.0199	.1030	.1960	.0646	.0060
	21	.0000	.0000	.0000	.0000	.0000	.0004	.0071	.0572	.1867	.1384	.0269
	22	.0000	.0000	.0000	.0000	.0000	.0001	.0019	.0243	.1358	.2265	.0930
	23	.0000	.0000	.0000	.0000	.0000	.0000	.0004	.0074	.0708	.2659	.2305
	24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0014	.0236	.1994	.3650
	25	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0038	.0718	.2774

Table II Values of $e^{-\lambda}$

λ	$e^{-\lambda}$	λ	$e^{-\lambda}$
0.0	1.00000000	3.9	.02024191
0.1	.90483742	4.0	.01831564
0.2	.81873075	4.1	.01657268
0.3	.74081822	4.2	.01499558
0.4	.67032005	4.3	.01356856
0.5	.60653066	4.4	.01227734
0.6	.54881164	4.5	.01110900
0.7	.49658530	4.6	.01005184
0.8	.44932896	4.7	.00909528
0.9	.40656966	4.8	.00822975
1.0	.36787944	4.9	.00744658
1.1	.33287108	5.0	.00673795
1.2	.30119421	5.1	.00609675
1.3	.27253179	5.2	.00551656
1.4	.24659696	5.3	.00499159
1.5	.22313016	5.4	.00451658
1.6	.20189652	5.5	.00408677
1.7	.18268352	5.6	.00369786
1.8	.16529889	5.7	.00334597
1.9	.14956862	5.8	.00302755
2.0	.13533528	5.9	.00273944
2.1	.12245643	6.0	.00247875
2.2	.11080316	6.1	.00224287
2.3	.10025884	6.2	.00202943
2.4	.09071795	6.3	.00183630
2.5	.08208500	6.4	.00166156
2.6	.07427358	6.5	.00150344
2.7	.06720551	6.6	.00136037
2.8	.06081006	6.7	.00123091
2.9	.05502322	6.8	.00111378
3.0	.04978707	6.9	.00100779
3.1	.04504920	7.0	.00091188
3.2	.04076220	7.1	.00082510
3.3	.03688317	7.2	.00074659
3.4	.03337327	7.3	.00067554
3.5	.03019738	7.4	.00061125
3.6	.02732372	7.5	.00055308
3.7	.02472353	7.6	.00050045
3.8	.02237077	7.7	.00045283

Table II Values of $e^{-\lambda}$ (continued)

λ	$e^{-\lambda}$	λ	$e^{-\lambda}$
7.8	.00040973	9.5	.00007485
7.9	.00037074	9.6	.00006773
8.0	.00033546	9.7	.00006128
8.1	.00030354	9.8	.00005545
8.2	.00027465	9.9	.00005017
8.3	.00024852	10.0	.00004540
8.4	.00022487	11.0	.00001670
8.5	.00020347	12.0	.00000614
8.6	.00018411	13.0	.00000226
8.7	.00016659	14.0	.00000083
8.8	.00015073	15.0	.00000031
8.9	.00013639	16.0	.00000011
9.0	.00012341	17.0	.00000004
9.1	.00011167	18.0	.000000015
9.2	.00010104	19.0	.000000006
9.3	.00009142	20.0	.000000002
9.4	.00008272		

Table III Table of Poisson Probabilities

					λ					
x	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
0	.9048	.8187	.7408	.6703	.6065	.5488	.4966	.4493	.4066	.3679
1	.0905	.1637	.2222	.2681	.3033	.3293	.3476	.3595	.3659	.3679
2	.0045	.0164	.0333	.0536	.0758	.0988	.1217	.1438	.1647	.1839
3	.0002	.0011	.0033	.0072	.0126	.0198	.0284	.0383	.0494	.0613
4	.0000	.0001	.0003	.0007	.0016	.0030	.0050	.0077	.0111	.0153
5	.0000	.0000	.0000	.0001	.0002	.0004	.0007	.0012	.0020	.0031
6	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0003	.0005
7	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

					λ					
x	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
0	.3329	.3012	.2725	.2466	.2231	.2019	.1827	.1653	.1496	.1353
1	.3662	.3614	.3543	.3452	.3347	.3230	.3106	.2975	.2842	.2707
2	.2014	.2169	.2303	.2417	.2510	.2584	.2640	.2678	.2700	.2707
3	.0738	.0867	.0998	.1128	.1255	.1378	.1496	.1607	.1710	.1804
4	.0203	.0260	.0324	.0395	.0471	.0551	.0636	.0723	.0812	.0902
5	.0045	.0062	.0084	.0111	.0141	.0176	.0216	.0260	.0309	.0361
6	.0008	.0012	.0018	.0026	.0035	.0047	.0061	.0078	.0098	.0120
7	.0001	.0002	.0003	.0005	.0008	.0011	.0015	.0020	.0027	.0034
8	.0000	.0000	.0001	.0001	.0001	.0002	.0003	.0005	.0006	.0009
9	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0002

					λ					
x	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0
0	.1225	.1108	.1003	.0907	.0821	.0743	.0672	.0608	.0550	.0498
1	.2572	.2438	.2306	.2177	.2052	.1931	.1815	.1703	.1596	.1494
2	.2700	.2681	.2652	.2613	.2565	.2510	.2450	.2384	.2314	.2240
3	.1890	.1966	.2033	.2090	.2138	.2176	.2205	.2225	.2237	.2240
4	.0992	.1082	.1169	.1254	.1336	.1414	.1488	.1557	.1622	.1680
5	.0417	.0476	.0538	.0602	.0668	.0735	.0804	.0872	.0940	.1008
6	.0146	.0174	.0206	.0241	.0278	.0319	.0362	.0407	.0455	.0504
7	.0044	.0055	.0068	.0083	.0099	.0118	.0139	.0163	.0188	.0216
8	.0011	.0015	.0019	.0025	.0031	.0038	.0047	.0057	.0068	.0081
9	.0003	.0004	.0005	.0007	.0009	.0011	.0014	.0018	.0022	.0027
10	.0001	.0001	.0001	.0002	.0002	.0003	.0004	.0005	.0006	.0008
11	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0002	.0002
12	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

Table III Table of Poisson Probabilities (continued)

					λ					
x	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0
0	.0450	.0408	.0369	.0334	.0302	.0273	.0247	.0224	.0202	.0183
1	.1397	.1304	.1217	.1135	.1057	.0984	.0915	.0850	.0789	.0733
2	.2165	.2087	.2008	.1929	.1850	.1771	.1692	.1615	.1539	.1465
3	.2237	.2226	.2209	.2186	.2158	.2125	.2087	.2046	.2001	.1954
4	.1733	.1781	.1823	.1858	.1888	.1912	.1931	.1944	.1951	.1954
5	.1075	.1140	.1203	.1264	.1322	.1377	.1429	.1477	.1522	.1563
6	.0555	.0608	.0662	.0716	.0771	.0826	.0881	.0936	.0989	.1042
7	.0246	.0278	.0312	.0348	.0385	.0425	.0466	.0508	.0551	.0595
8	.0095	.0111	.0129	.0148	.0169	.0191	.0215	.0241	.0269	.0298
9	.0033	.0040	.0047	.0056	.0066	.0076	.0089	.0102	.0116	.0132
10	.0010	.0013	.0016	.0019	.0023	.0028	.0033	.0039	.0045	.0053
11	.0003	.0004	.0005	.0006	.0007	.0009	.0011	.0013	.0016	.0019
12	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0005	.0006
13	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0002	.0002
14	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

					λ					
x	4.1	4.2	4.3	4.4	4.5	4.6	4.7	4.8	4.9	5.0
0	.0166	.0150	.0136	.0123	.0111	.0101	.0091	.0082	.0074	.0067
1	.0679	.0630	.0583	.0540	.0500	.0462	.0427	.0395	.0365	.0337
2	.1393	.1323	.1254	.1188	.1125	.1063	.1005	.0948	.0894	.0842
3	.1904	.1852	.1798	.1743	.1687	.1631	.1574	.1517	.1460	.1404
4	.1951	.1944	.1933	.1917	.1898	.1875	.1849	.1820	.1789	.1755
5	.1600	.1633	.1662	.1687	.1708	.1725	.1738	.1747	.1753	.1755
6	.1093	.1143	.1191	.1237	.1281	.1323	.1362	.1398	.1432	.1462
7	.0640	.0686	.0732	.0778	.0824	.0869	.0914	.0959	.1002	.1044
8	.0328	.0360	.0393	.0428	.0463	.0500	.0537	.0575	.0614	.0653
9	.0150	.0168	.0188	.0209	.0232	.0255	.0281	.0307	.0334	.0363
10	.0061	.0071	.0081	.0092	.0104	.0118	.0132	.0147	.0164	.0181
11	.0023	.0027	.0032	.0037	.0043	.0049	.0056	.0064	.0073	.0082
12	.0008	.0009	.0011	.0014	.0016	.0019	.0022	.0026	.0030	.0034
13	.0002	.0003	.0004	.0005	.0006	.0007	.0008	.0009	.0011	.0013
14	.0001	.0001	.0001	.0001	.0002	.0002	.0003	.0003	.0004	.0005
15	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0002

					λ					
x	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0
0	.0061	.0055	.0050	.0045	.0041	.0037	.0033	.0030	.0027	.0025
1	.0311	.0287	.0265	.0244	.0225	.0207	.0191	.0176	.0162	.0149

Table III Table of Poisson Probabilities (continued)

					λ					
x	5.1	5.2	5.3	5.4	5.5	5.6	5.7	5.8	5.9	6.0
2	.0793	.0746	.0701	.0659	.0618	.0580	.0544	.0509	.0477	.0446
3	.1348	.1293	.1239	.1185	.1133	.1082	.1033	.0985	.0938	.0892
4	.1719	.1681	.1641	.1600	.1558	.1515	.1472	.1428	.1383	.1339
5	.1753	.1748	.1740	.1728	.1714	.1697	.1678	.1656	.1632	.1606
6	.1490	.1515	.1537	.1555	.1571	.1584	.1594	.1601	.1605	.1606
7	.1086	.1125	.1163	.1200	.1234	.1267	.1298	.1326	.1353	.1377
8	.0692	.0731	.0771	.0810	.0849	.0887	.0925	.0962	.0998	.1033
9	.0392	.0423	.0454	.0486	.0519	.0552	.0586	.0620	.0654	.0688
10	.0200	.0220	.0241	.0262	.0285	.0309	.0334	.0359	.0386	.0413
11	.0093	.0104	.0116	.0129	.0143	.0157	.0173	.0190	.0207	.0225
12	.0039	.0045	.0051	.0058	.0065	.0073	.0082	.0092	.0102	.0113
13	.0015	.0018	.0021	.0024	.0028	.0032	.0036	.0041	.0046	.0052
14	.0006	.0007	.0008	.0009	.0011	.0013	.0015	.0017	.0019	.0022
15	.0002	.0002	.0003	.0003	.0004	.0005	.0006	.0007	.0008	.0009
16	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003
17	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001

					λ					
x	6.1	6.2	6.3	6.4	6.5	6.6	6.7	6.8	6.9	7.0
0	.0022	.0020	.0018	.0017	.0015	.0014	.0012	.0011	.0010	.0009
1	.0137	.0126	.0116	.0106	.0098	.0090	.0082	.0076	.0070	.0064
2	.0417	.0390	.0364	.0340	.0318	.0296	.0276	.0258	.0240	.0223
3	.0848	.0806	.0765	.0726	.0688	.0652	.0617	.0584	.0552	.0521
4	.1294	.1249	.1205	.1162	.1118	.1076	.1034	.0992	.0952	.0912
5	.1579	.1549	.1519	.1487	.1454	.1420	.1385	.1349	.1314	.1277
6	.1605	.1601	.1595	.1586	.1575	.1562	.1546	.1529	.1511	.1490
7	.1399	.1418	.1435	.1450	.1462	.1472	.1480	.1486	.1489	.1490
8	.1066	.1099	.1130	.1160	.1188	.1215	.1240	.1263	.1284	.1304
9	.0723	.0757	.0791	.0825	.0858	.0891	.0923	.0954	.0985	.1014
10	.0441	.0469	.0498	.0528	.0558	.0588	.0618	.0649	.0679	.0710
11	.0244	.0265	.0285	.0307	.0330	.0353	.0377	.0401	.0426	.0452
12	.0124	.0137	.0150	.0164	.0179	.0194	.0210	.0227	.0245	.0263
13	.0058	.0065	.0073	.0081	.0089	.0099	.0108	.0119	.0130	.0142
14	.0025	.0029	.0033	.0037	.0041	.0046	.0052	.0058	.0064	.0071
15	.0010	.0012	.0014	.0016	.0018	.0020	.0023	.0026	.0029	.0033
16	.0004	.0005	.0005	.0006	.0007	.0008	.0010	.0011	.0013	.0014
17	.0001	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0006
18	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002
19	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001

Table III Table of Poisson Probabilities (continued)

					λ					
x	7.1	7.2	7.3	7.4	7.5	7.6	7.7	7.8	7.9	8.0
0	.0008	.0007	.0007	.0006	.0006	.0005	.0005	.0004	.0004	.0003
1	.0059	.0054	.0049	.0045	.0041	.0038	.0035	.0032	.0029	.0027
2	.0208	.0194	.0180	.0167	.0156	.0145	.0134	.0125	.0116	.0107
3	.0492	.0464	.0438	.0413	.0389	.0366	.0345	.0324	.0305	.0286
4	.0874	.0836	.0799	.0764	.0729	.0696	.0663	.0632	.0602	.0573
5	.1241	.1204	.1167	.1130	.1094	.1057	.1021	.0986	.0951	.0916
6	.1468	.1445	.1420	.1394	.1367	.1339	.1311	.1282	.1252	.1221
7	.1489	.1486	.1481	.1474	.1465	.1454	.1442	.1428	.1413	.1396
8	.1321	.1337	.1351	.1363	.1373	.1381	.1388	.1392	.1395	.1396
9	.1042	.1070	.1096	.1121	.1144	.1167	.1187	.1207	.1224	.1241
10	.0740	.0770	.0800	.0829	.0858	.0887	.0914	.0941	.0967	.0993
11	.0478	.0504	.0531	.0558	.0585	.0613	.0640	.0667	.0695	.0722
12	.0283	.0303	.0323	.0344	.0366	.0388	.0411	.0434	.0457	.0481
13	.0154	.0168	.0181	.0196	.0211	.0227	.0243	.0260	.0278	.0296
14	.0078	.0086	.0095	.0104	.0113	.0123	.0134	.0145	.0157	.0169
15	.0037	.0041	.0046	.0051	.0057	.0062	.0069	.0075	.0083	.0090
16	.0016	.0019	.0021	.0024	.0026	.0030	.0033	.0037	.0041	.0045
17	.0007	.0008	.0009	.0010	.0012	.0013	.0015	.0017	.0019	.0021
18	.0003	.0003	.0004	.0004	.0005	.0006	.0006	.0007	.0008	.0009
19	.0001	.0001	.0001	.0002	.0002	.0002	.0003	.0003	.0003	.0004
20	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002
21	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0001

					λ					
x	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0
0	.0003	.0003	.0002	.0002	.0002	.0002	.0002	.0002	.0001	.0001
1	.0025	.0023	.0021	.0019	.0017	.0016	.0014	.0013	.0012	.0011
2	.0100	.0092	.0086	.0079	.0074	.0068	.0063	.0058	.0054	.0050
3	.0269	.0252	.0237	.0222	.0208	.0195	.0183	.0171	.0160	.0150
4	.0544	.0517	.0491	.0466	.0443	.0420	.0398	.0377	.0357	.0337
5	.0882	.0849	.0816	.0784	.0752	.0722	.0692	.0663	.0635	.0607
6	.1191	.1160	.1128	.1097	.1066	.1034	.1003	.0972	.0941	.0911
7	.1378	.1358	.1338	.1317	.1294	.1271	.1247	.1222	.1197	.1171
8	.1395	.1392	.1388	.1382	.1375	.1366	.1356	.1344	.1332	.1318
9	.1255	.1269	.1280	.1290	.1299	.1306	.1311	.1315	.1317	.1318
10	.1017	.1040	.1063	.1084	.1104	.1123	.1140	.1157	.1172	.1186
11	.0749	.0775	.0802	.0828	.0853	.0878	.0902	.0925	.0948	.0970
12	.0505	.0530	.0555	.0579	.0604	.0629	.0654	.0679	.0703	.0728

Table III Table of Poisson Probabilities (continued)

					λ					
x	8.1	8.2	8.3	8.4	8.5	8.6	8.7	8.8	8.9	9.0
13	.0315	.0334	.0354	.0374	.0395	.0416	.0438	.0459	.0481	.0504
14	.0182	.0196	.0210	.0225	.0240	.0256	.0272	.0289	.0306	.0324
15	.0098	.0107	.0116	.0126	.0136	.0147	.0158	.0169	.0182	.0194
16	.0050	.0055	.0060	.0066	.0072	.0079	.0086	.0093	.0101	.0109
17	.0024	.0026	.0029	.0033	.0036	.0040	.0044	.0048	.0053	.0058
18	.0011	.0012	.0014	.0015	.0017	.0019	.0021	.0024	.0026	.0029
19	.0005	.0005	.0006	.0007	.0008	.0009	.0010	.0011	.0012	.0014
20	.0002	.0002	.0002	.0003	.0003	.0004	.0004	.0005	.0005	.0006
21	.0001	.0001	.0001	.0001	.0001	.0002	.0002	.0002	.0002	.0003
22	.0000	.0000	.0000	.0000	.0001	.0001	.0001	.0001	.0001	.0001

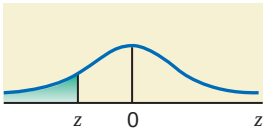
					λ					
x	9.1	9.2	9.3	9.4	9.5	9.6	9.7	9.8	9.9	10
0	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0000
1	.0010	.0009	.0009	.0008	.0007	.0007	.0006	.0005	.0005	.0005
2	.0046	.0043	.0040	.0037	.0034	.0031	.0029	.0027	.0025	.0023
3	.0140	.0131	.0123	.0115	.0107	.0100	.0093	.0087	.0081	.0076
4	.0319	.0302	.0285	.0269	.0254	.0240	.0226	.0213	.0201	.0189
5	.0581	.0555	.0530	.0506	.0483	.0460	.0439	.0418	.0398	.0378
6	.0881	.0851	.0822	.0793	.0764	.0736	.0709	.0682	.0656	.0631
7	.1145	.1118	.1091	.1064	.1037	.1010	.0982	.0955	.0928	.0901
8	.1302	.1286	.1269	.1251	.1232	.1212	.1191	.1170	.1148	.1126
9	.1317	.1315	.1311	.1306	.1300	.1293	.1284	.1274	.1263	.1251
10	.1198	.1209	.1219	.1228	.1235	.1241	.1245	.1249	.1250	.1251
11	.0991	.1012	.1031	.1049	.1067	.1083	.1098	.1112	.1125	.1137
12	.0752	.0776	.0799	.0822	.0844	.0866	.0888	.0908	.0928	.0948
13	.0526	.0549	.0572	.0594	.0617	.0640	.0662	.0685	.0707	.0729
14	.0342	.0361	.0380	.0399	.0419	.0439	.0459	.0479	.0500	.0521
15	.0208	.0221	.0235	.0250	.0265	.0281	.0297	.0313	.0330	.0347
16	.0118	.0127	.0137	.0147	.0157	.0168	.0180	.0192	.0204	.0217
17	.0063	.0069	.0075	.0081	.0088	.0095	.0103	.0111	.0119	.0128
18	.0032	.0035	.0039	.0042	.0046	.0051	.0055	.0060	.0065	.0071
19	.0015	.0017	.0019	.0021	.0023	.0026	.0028	.0031	.0034	.0037
20	.0007	.0008	.0009	.0010	.0011	.0012	.0014	.0015	.0017	.0019
21	.0003	.0003	.0004	.0004	.0005	.0006	.0006	.0007	.0008	.0009
22	.0001	.0001	.0002	.0002	.0002	.0002	.0003	.0003	.0004	.0004
23	.0000	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0002	.0002
24	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0001	.0001

Table III Table of Poisson Probabilities (continued)

					λ					
x	11	12	13	14	15	16	17	18	19	20
0	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
1	.0002	.0001	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000
2	.0010	.0004	.0002	.0001	.0000	.0000	.0000	.0000	.0000	.0000
3	.0037	.0018	.0008	.0004	.0002	.0001	.0000	.0000	.0000	.0000
4	.0102	.0053	.0027	.0013	.0006	.0003	.0001	.0001	.0000	.0000
5	.0224	.0127	.0070	.0037	.0019	.0010	.0005	.0002	.0001	.0001
6	.0411	.0255	.0152	.0087	.0048	.0026	.0014	.0007	.0004	.0002
7	.0646	.0437	.0281	.0174	.0104	.0060	.0034	.0019	.0010	.0005
8	.0888	.0655	.0457	.0304	.0194	.0120	.0072	.0042	.0024	.0013
9	.1085	.0874	.0661	.0473	.0324	.0213	.0135	.0083	.0050	.0029
10	.1194	.1048	.0859	.0663	.0486	.0341	.0230	.0150	.0095	.0058
11	.1194	.1144	.1015	.0844	.0663	.0496	.0355	.0245	.0164	.0106
12	.1094	.1144	.1099	.0984	.0829	.0661	.0504	.0368	.0259	.0176
13	.0926	.1056	.1099	.1060	.0956	.0814	.0658	.0509	.0378	.0271
14	.0728	.0905	.1021	.1060	.1024	.0930	.0800	.0655	.0514	.0387
15	.0534	.0724	.0885	.0989	.1024	.0992	.0906	.0786	.0650	.0516
16	.0367	.0543	.0719	.0866	.0960	.0992	.0963	.0884	.0772	.0646
17	.0237	.0383	.0550	.0713	.0847	.0934	.0963	.0936	.0863	.0760
18	.0145	.0255	.0397	.0554	.0706	.0830	.0909	.0936	.0911	.0844
19	.0084	.0161	.0272	.0409	.0557	.0699	.0814	.0887	.0911	.0888
20	.0046	.0097	.0177	.0286	.0418	.0559	.0692	.0798	.0866	.0888
21	.0024	.0055	.0109	.0191	.0299	.0426	.0560	.0684	.0783	.0846
22	.0012	.0030	.0065	.0121	.0204	.0310	.0433	.0560	.0676	.0769
23	.0006	.0016	.0037	.0074	.0133	.0216	.0320	.0438	.0559	.0669
24	.0003	.0008	.0020	.0043	.0083	.0144	.0226	.0328	.0442	.0557
25	.0001	.0004	.0010	.0024	.0050	.0092	.0154	.0237	.0336	.0446
26	.0000	.0002	.0005	.0013	.0029	.0057	.0101	.0164	.0246	.0343
27	.0000	.0001	.0002	.0007	.0016	.0034	.0063	.0109	.0173	.0254
28	.0000	.0000	.0001	.0003	.0009	.0019	.0038	.0070	.0117	.0181
29	.0000	.0000	.0001	.0002	.0004	.0011	.0023	.0044	.0077	.0125
30	.0000	.0000	.0000	.0001	.0002	.0006	.0013	.0026	.0049	.0083
31	.0000	.0000	.0000	.0000	.0001	.0003	.0007	.0015	.0030	.0054
32	.0000	.0000	.0000	.0000	.0001	.0001	.0004	.0009	.0018	.0034
33	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0005	.0010	.0020
34	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0006	.0012
35	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0003	.0007
36	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002	.0004
37	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001	.0002
38	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001
39	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0001

Table IV Standard Normal Distribution Table

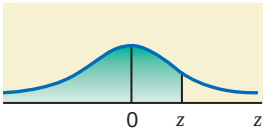
The entries in this table give the cumulative area under the standard normal curve to the left of *z* with the values of *z* equal to 0 or negative.



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.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

Table IV Standard Normal Distribution Table (continued)

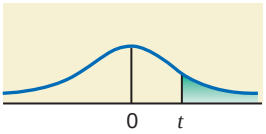
The entries in this table give the cumulative area under the standard normal curve to the left of *z* with the values of *z* equal to 0 or positive.



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

Table V The *t* Distribution Table

The entries in this table give the critical values of *t* for the specified number of degrees of freedom and areas in the right tail.



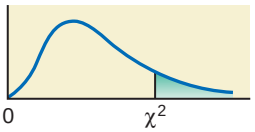
	Area in the Right Tail Under the *t* Distribution Curve					
df	**.10**	**.05**	**.025**	**.01**	**.005**	**.001**
1	3.078	6.314	12.706	31.821	63.657	318.309
2	1.886	2.920	4.303	6.965	9.925	22.327
3	1.638	2.353	3.182	4.541	5.841	10.215
4	1.533	2.132	2.776	3.747	4.604	7.173
5	1.476	2.015	2.571	3.365	4.032	5.893
6	1.440	1.943	2.447	3.143	3.707	5.208
7	1.415	1.895	2.365	2.998	3.499	4.785
8	1.397	1.860	2.306	2.896	3.355	4.501
9	1.383	1.833	2.262	2.821	3.250	4.297
10	1.372	1.812	2.228	2.764	3.169	4.144
11	1.363	1.796	2.201	2.718	3.106	4.025
12	1.356	1.782	2.179	2.681	3.055	3.930
13	1.350	1.771	2.160	2.650	3.012	3.852
14	1.345	1.761	2.145	2.624	2.977	3.787
15	1.341	1.753	2.131	2.602	2.947	3.733
16	1.337	1.746	2.120	2.583	2.921	3.686
17	1.333	1.740	2.110	2.567	2.898	3.646
18	1.330	1.734	2.101	2.552	2.878	3.610
19	1.328	1.729	2.093	2.539	2.861	3.579
20	1.325	1.725	2.086	2.528	2.845	3.552
21	1.323	1.721	2.080	2.518	2.831	3.527
22	1.321	1.717	2.074	2.508	2.819	3.505
23	1.319	1.714	2.069	2.500	2.807	3.485
24	1.318	1.711	2.064	2.492	2.797	3.467
25	1.316	1.708	2.060	2.485	2.787	3.450
26	1.315	1.706	2.056	2.479	2.779	3.435
27	1.314	1.703	2.052	2.473	2.771	3.421
28	1.313	1.701	2.048	2.467	2.763	3.408
29	1.311	1.699	2.045	2.462	2.756	3.396
30	1.310	1.697	2.042	2.457	2.750	3.385
31	1.309	1.696	2.040	2.453	2.744	3.375
32	1.309	1.694	2.037	2.449	2.738	3.365
33	1.308	1.692	2.035	2.445	2.733	3.356
34	1.307	1.691	2.032	2.441	2.728	3.348
35	1.306	1.690	2.030	2.438	2.724	3.340

Table V The *t* Distribution Table (continued)

	Area in the Right Tail Under the *t* Distribution Curve					
df	**.10**	**.05**	**.025**	**.01**	**.005**	**.001**
36	1.306	1.688	2.028	2.434	2.719	3.333
37	1.305	1.687	2.026	2.431	2.715	3.326
38	1.304	1.686	2.024	2.429	2.712	3.319
39	1.304	1.685	2.023	2.426	2.708	3.313
40	1.303	1.684	2.021	2.423	2.704	3.307
41	1.303	1.683	2.020	2.421	2.701	3.301
42	1.302	1.682	2.018	2.418	2.698	3.296
43	1.302	1.681	2.017	2.416	2.695	3.291
44	1.301	1.680	2.015	2.414	2.692	3.286
45	1.301	1.679	2.014	2.412	2.690	3.281
46	1.300	1.679	2.013	2.410	2.687	3.277
47	1.300	1.678	2.012	2.408	2.685	3.273
48	1.299	1.677	2.011	2.407	2.682	3.269
49	1.299	1.677	2.010	2.405	2.680	3.265
50	1.299	1.676	2.009	2.403	2.678	3.261
51	1.298	1.675	2.008	2.402	2.676	3.258
52	1.298	1.675	2.007	2.400	2.674	3.255
53	1.298	1.674	2.006	2.399	2.672	3.251
54	1.297	1.674	2.005	2.397	2.670	3.248
55	1.297	1.673	2.004	2.396	2.668	3.245
56	1.297	1.673	2.003	2.395	2.667	3.242
57	1.297	1.672	2.002	2.394	2.665	3.239
58	1.296	1.672	2.002	2.392	2.663	3.237
59	1.296	1.671	2.001	2.391	2.662	3.234
60	1.296	1.671	2.000	2.390	2.660	3.232
61	1.296	1.670	2.000	2.389	2.659	3.229
62	1.295	1.670	1.999	2.388	2.657	3.227
63	1.295	1.669	1.998	2.387	2.656	3.225
64	1.295	1.669	1.998	2.386	2.655	3.223
65	1.295	1.669	1.997	2.385	2.654	3.220
66	1.295	1.668	1.997	2.384	2.652	3.218
67	1.294	1.668	1.996	2.383	2.651	3.216
68	1.294	1.668	1.995	2.382	2.650	3.214
69	1.294	1.667	1.995	2.382	2.649	3.213
70	1.294	1.667	1.994	2.381	2.648	3.211
71	1.294	1.667	1.994	2.380	2.647	3.209
72	1.293	1.666	1.993	2.379	2.646	3.207
73	1.293	1.666	1.993	2.379	2.645	3.206
74	1.293	1.666	1.993	2.378	2.644	3.204
75	1.293	1.665	1.992	2.377	2.643	3.202
∞	1.282	1.645	1.960	2.326	2.576	3.090

Table VI Chi-Square Distribution Table

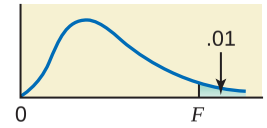
The entries in this table give the critical values of χ^2 for the specified number of degrees of freedom and areas in the right tail.



	Area in the Right Tail Under the Chi-square Distribution Curve									
df	.995	.990	.975	.950	.900	.100	.050	.025	.010	.005
1	0.000	0.000	0.001	0.004	0.016	2.706	3.841	5.024	6.635	7.879
2	0.010	0.020	0.051	0.103	0.211	4.605	5.991	7.378	9.210	10.597
3	0.072	0.115	0.216	0.352	0.584	6.251	7.815	9.348	11.345	12.838
4	0.207	0.297	0.484	0.711	1.064	7.779	9.488	11.143	13.277	14.860
5	0.412	0.554	0.831	1.145	1.610	9.236	11.070	12.833	15.086	16.750
6	0.676	0.872	1.237	1.635	2.204	10.645	12.592	14.449	16.812	18.548
7	0.989	1.239	1.690	2.167	2.833	12.017	14.067	16.013	18.475	20.278
8	1.344	1.646	2.180	2.733	3.490	13.362	15.507	17.535	20.090	21.955
9	1.735	2.088	2.700	3.325	4.168	14.684	16.919	19.023	21.666	23.589
10	2.156	2.558	3.247	3.940	4.865	15.987	18.307	20.483	23.209	25.188
11	2.603	3.053	3.816	4.575	5.578	17.275	19.675	21.920	24.725	26.757
12	3.074	3.571	4.404	5.226	6.304	18.549	21.026	23.337	26.217	28.300
13	3.565	4.107	5.009	5.892	7.042	19.812	22.362	24.736	27.688	29.819
14	4.075	4.660	5.629	6.571	7.790	21.064	23.685	26.119	29.141	31.319
15	4.601	5.229	6.262	7.261	8.547	22.307	24.996	27.488	30.578	32.801
16	5.142	5.812	6.908	7.962	9.312	23.542	26.296	28.845	32.000	34.267
17	5.697	6.408	7.564	8.672	10.085	24.769	27.587	30.191	33.409	35.718
18	6.265	7.015	8.231	9.390	10.865	25.989	28.869	31.526	34.805	37.156
19	6.844	7.633	8.907	10.117	11.651	27.204	30.144	32.852	36.191	38.582
20	7.434	8.260	9.591	10.851	12.443	28.412	31.410	34.170	37.566	39.997
21	8.034	8.897	10.283	11.591	13.240	29.615	32.671	35.479	38.932	41.401
22	8.643	9.542	10.982	12.338	14.041	30.813	33.924	36.781	40.289	42.796
23	9.260	10.196	11.689	13.091	14.848	32.007	35.172	38.076	41.638	44.181
24	9.886	10.856	12.401	13.848	15.659	33.196	36.415	39.364	42.980	45.559
25	10.520	11.524	13.120	14.611	16.473	34.382	37.652	40.646	44.314	46.928
26	11.160	12.198	13.844	15.379	17.292	35.563	38.885	41.923	45.642	48.290
27	11.808	12.879	14.573	16.151	18.114	36.741	40.113	43.195	46.963	49.645
28	12.461	13.565	15.308	16.928	18.939	37.916	41.337	44.461	48.278	50.993
29	13.121	14.256	16.047	17.708	19.768	39.087	42.557	45.722	49.588	52.336
30	13.787	14.953	16.791	18.493	20.599	40.256	43.773	46.979	50.892	53.672
40	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766
50	27.991	29.707	32.357	34.764	37.689	63.167	67.505	71.420	76.154	79.490
60	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952
70	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215
80	51.172	53.540	57.153	60.391	64.278	96.578	101.879	106.629	112.329	116.321
90	59.196	61.754	65.647	69.126	73.291	107.565	113.145	118.136	124.116	128.299
100	67.328	70.065	74.222	77.929	82.358	118.498	124.342	129.561	135.807	140.169

Table VII The *F* Distribution Table

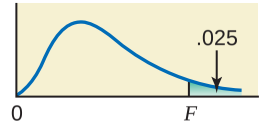
The entries in this table give the critical values of *F* for .01 area in the right tail under the *F* distribution curve and specified degrees of freedom for the numerator and denominator.



Degrees of Freedom for the Denominator	Degrees of Freedom for the Numerator																		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**15**	**20**	**25**	**30**	**40**	**50**	**100**
1	4052	5000	5403	5625	5764	5859	5928	5981	6022	6056	6083	6106	6157	6209	6240	6261	6287	6303	6334
2	98.50	99.00	99.17	99.25	99.30	99.33	99.36	99.37	99.39	99.40	99.41	99.42	99.43	99.45	99.46	99.47	99.47	99.48	99.49
3	34.12	30.82	29.46	28.71	28.24	27.91	27.67	27.49	27.35	27.23	27.13	27.05	26.87	26.69	26.58	26.50	26.41	26.35	26.24
4	21.20	18.00	16.69	15.98	15.52	15.21	14.98	14.80	14.66	14.55	14.45	14.37	14.20	14.02	13.91	13.84	13.75	13.69	13.58
5	16.26	13.27	12.06	11.39	10.97	10.67	10.46	10.29	10.16	10.05	9.96	9.89	9.72	9.55	9.45	9.38	9.29	9.24	9.13
6	13.75	10.92	9.78	9.15	8.75	8.47	8.26	8.10	7.98	7.87	7.79	7.72	7.56	7.40	7.30	7.23	7.14	7.09	6.99
7	12.25	9.55	8.45	7.85	7.46	7.19	6.99	6.84	6.72	6.62	6.54	6.47	6.31	6.16	6.06	5.99	5.91	5.86	5.75
8	11.26	8.65	7.59	7.01	6.63	6.37	6.18	6.03	5.91	5.81	5.73	5.67	5.52	5.36	5.26	5.20	5.12	5.07	4.96
9	10.56	8.02	6.99	6.42	6.06	5.80	5.61	5.47	5.35	5.26	5.18	5.11	4.96	4.81	4.71	4.65	4.57	4.52	4.41
10	10.04	7.56	6.55	5.99	5.64	5.39	5.20	5.06	4.94	4.85	4.77	4.71	4.56	4.41	4.31	4.25	4.17	4.12	4.01
11	9.65	7.21	6.22	5.67	5.32	5.07	4.89	4.74	4.63	4.54	4.46	4.40	4.25	4.10	4.01	3.94	3.86	3.81	3.71
12	9.33	6.93	5.95	5.41	5.06	4.82	4.64	4.50	4.39	4.30	4.22	4.16	4.01	3.86	3.76	3.70	3.62	3.57	3.47
13	9.07	6.70	5.74	5.21	4.86	4.62	4.44	4.30	4.19	4.10	4.02	3.96	3.82	3.66	3.57	3.51	3.43	3.38	3.27
14	8.86	6.51	5.56	5.04	4.69	4.46	4.28	4.14	4.03	3.94	3.86	3.80	3.66	3.51	3.41	3.35	3.27	3.22	3.11
15	8.68	6.36	5.42	4.89	4.56	4.32	4.14	4.00	3.89	3.80	3.73	3.67	3.52	3.37	3.28	3.21	3.13	3.08	2.98
16	8.53	6.23	5.29	4.77	4.44	4.20	4.03	3.89	3.78	3.69	3.62	3.55	3.41	3.26	3.16	3.10	3.02	2.97	2.86
17	8.40	6.11	5.18	4.67	4.34	4.10	3.93	3.79	3.68	3.59	3.52	3.46	3.31	3.16	3.07	3.00	2.92	2.87	2.76
18	8.29	6.01	5.09	4.58	4.25	4.01	3.84	3.71	3.60	3.51	3.43	3.37	3.23	3.08	2.98	2.92	2.84	2.78	2.68
19	8.18	5.93	5.01	4.50	4.17	3.94	3.77	3.63	3.52	3.43	3.36	3.30	3.15	3.00	2.91	2.84	2.76	2.71	2.60
20	8.10	5.85	4.94	4.43	4.10	3.87	3.70	3.56	3.46	3.37	3.29	3.23	3.09	2.94	2.84	2.78	2.69	2.64	2.54
21	8.02	5.78	4.87	4.37	4.04	3.81	3.64	3.51	3.40	3.31	3.24	3.17	3.03	2.88	2.79	2.72	2.64	2.58	2.48
22	7.95	5.72	4.82	4.31	3.99	3.76	3.59	3.45	3.35	3.26	3.18	3.12	2.98	2.83	2.73	2.67	2.58	2.53	2.42
23	7.88	5.66	4.76	4.26	3.94	3.71	3.54	3.41	3.30	3.21	3.14	3.07	2.93	2.78	2.69	2.62	2.54	2.48	2.37
24	7.82	5.61	4.72	4.22	3.90	3.67	3.50	3.36	3.26	3.17	3.09	3.03	2.89	2.74	2.64	2.58	2.49	2.44	2.33
25	7.77	5.57	4.68	4.18	3.85	3.63	3.46	3.32	3.22	3.13	3.06	2.99	2.85	2.70	2.60	2.54	2.45	2.40	2.29
30	7.56	5.39	4.51	4.02	3.70	3.47	3.30	3.17	3.07	2.98	2.91	2.84	2.70	2.55	2.45	2.39	2.30	2.25	2.13
40	7.31	5.18	4.31	3.83	3.51	3.29	3.12	2.99	2.89	2.80	2.73	2.66	2.52	2.37	2.27	2.20	2.11	2.06	1.94
50	7.17	5.06	4.20	3.72	3.41	3.19	3.02	2.89	2.78	2.70	2.63	2.56	2.42	2.27	2.17	2.10	2.01	1.95	1.82
100	6.90	4.82	3.98	3.51	3.21	2.99	2.82	2.69	2.59	2.50	2.43	2.37	2.22	2.07	1.97	1.89	1.80	1.74	1.60

Table VII The *F* Distribution Table (continued)

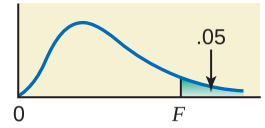
The entries in this table give the critical values of *F* for .025 area in the right tail under the *F* distribution curve and specified degrees of freedom for the numerator and denominator.



Degrees of Freedom for the Denominator	Degrees of Freedom for the Numerator																		
	1	2	3	4	5	6	7	8	9	10	11	12	15	20	25	30	40	50	100
1	647.8	799.5	864.2	899.6	921.8	937.1	948.2	956.7	963.3	968.6	973.0	976.7	984.9	993.1	998.1	1001	1006	1008	1013
2	38.51	39.00	39.17	39.25	39.30	39.33	39.36	39.37	39.39	39.40	39.41	39.41	39.43	39.45	39.46	39.46	39.47	39.48	39.49
3	17.44	16.04	15.44	15.10	14.88	14.73	14.62	14.54	14.47	14.42	14.37	14.34	14.25	14.17	14.12	14.08	14.04	14.01	13.96
4	12.22	10.65	9.98	9.61	6.36	9.20	9.07	8.98	8.90	8.84	8.79	8.75	8.66	8.56	8.50	8.46	8.41	8.38	8.32
5	10.01	8.43	7.76	7.39	7.15	6.98	6.85	6.76	6.68	6.62	6.57	6.52	6.43	6.33	6.27	6.23	6.18	6.14	6.08
6	8.81	7.26	6.60	6.23	5.99	5.82	5.70	5.60	5.52	5.46	5.41	5.37	5.27	5.17	5.11	5.07	5.01	4.98	4.92
7	8.07	6.54	5.89	5.52	5.29	5.12	4.99	4.90	4.82	4.76	4.71	4.67	4.57	4.47	4.40	4.36	4.31	4.28	4.21
8	7.57	6.06	5.42	5.05	4.82	4.65	4.53	4.43	4.36	4.30	4.24	4.20	4.10	4.00	3.94	3.89	3.84	3.81	3.74
9	7.21	5.72	5.08	4.72	4.48	4.32	4.20	4.10	4.03	3.96	3.91	3.87	3.77	3.67	3.60	3.56	3.51	3.47	3.40
10	6.94	5.46	4.83	4.47	4.24	4.07	3.95	3.85	3.78	3.72	3.66	3.62	3.52	3.42	3.35	3.31	3.26	3.22	3.15
11	6.72	5.26	4.63	4.28	4.04	3.88	3.76	3.66	3.59	3.53	3.47	3.43	3.33	3.23	3.16	3.12	3.06	3.03	2.96
12	6.55	5.10	4.47	4.12	3.89	3.73	3.61	3.51	3.44	3.37	3.32	3.28	3.18	3.07	3.01	2.96	2.91	2.87	2.80
13	6.41	4.97	4.35	4.00	3.77	3.60	3.48	3.39	3.31	3.25	3.20	3.15	3.05	2.95	2.88	2.84	2.78	2.74	2.67
14	6.30	4.86	4.24	3.89	3.66	3.50	3.38	3.29	3.21	3.15	3.09	3.05	2.95	2.84	2.78	2.73	2.67	2.64	2.56
15	6.20	4.77	4.15	3.80	3.58	3.41	3.29	3.20	3.12	3.06	3.01	2.96	2.86	2.76	2.69	2.64	2.59	2.55	2.47
16	6.12	4.69	4.08	3.73	3.50	3.34	3.22	3.12	3.05	2.99	2.93	2.89	2.79	2.68	2.61	2.57	2.51	2.47	2.40
17	6.04	4.62	4.01	3.66	3.44	3.28	3.16	3.06	2.98	2.92	2.87	2.82	2.72	2.62	2.55	2.50	2.44	2.41	2.33
18	5.98	4.56	3.95	3.61	3.38	3.22	3.10	3.01	2.93	2.87	2.81	2.77	2.67	2.56	2.49	2.44	2.38	2.35	2.27
19	5.92	4.51	3.90	3.56	3.33	3.17	3.05	2.96	2.88	2.82	2.76	2.72	2.62	2.51	2.44	2.39	2.33	2.30	2.22
20	5.87	4.46	3.86	3.51	3.29	3.13	3.01	2.91	2.84	2.77	2.72	2.68	2.57	2.46	2.40	2.35	2.29	2.25	2.17
21	5.83	4.42	3.82	3.48	3.25	3.09	2.97	2.87	2.80	2.73	2.68	2.64	2.53	2.42	2.36	2.31	2.25	2.21	2.13
22	5.79	4.38	3.78	3.44	3.22	3.05	2.93	2.84	2.76	2.70	2.65	2.60	2.50	2.39	2.32	2.27	2.21	2.17	2.09
23	5.75	4.35	3.75	3.41	3.18	3.02	2.90	2.81	2.73	2.67	2.62	2.57	2.47	2.36	2.29	2.24	2.18	2.14	2.06
24	5.72	4.32	3.72	3.38	3.15	2.99	2.87	2.78	2.70	2.64	2.59	2.54	2.44	2.33	2.26	2.21	2.15	2.11	2.02
25	5.69	4.29	3.69	3.35	3.13	2.97	2.85	2.75	2.68	2.61	2.56	2.51	2.41	2.30	2.23	2.18	2.12	2.08	2.00
30	5.57	4.18	3.59	3.25	3.03	2.87	2.75	2.65	2.57	2.51	2.46	2.41	2.31	2.20	2.12	2.07	2.01	1.97	1.88
40	5.42	4.05	3.46	3.13	2.90	2.74	2.62	2.53	2.45	2.39	2.33	2.29	2.18	2.07	1.99	1.94	1.88	1.83	1.74
50	5.34	3.97	3.39	3.05	2.83	2.67	2.55	2.46	2.38	2.32	2.26	2.22	2.11	1.99	1.92	1.87	1.80	1.75	1.66
100	5.18	3.83	3.25	2.92	2.70	2.54	2.42	2.32	2.24	2.18	2.12	2.08	1.97	1.85	1.77	1.71	1.64	1.59	1.48

Table VII The *F* Distribution Table (continued)

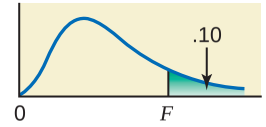
The entries in this table give the critical values of *F* for .05 area in the right tail under the *F* distribution curve and specified degrees of freedom for the numerator and denominator.



Degrees of Freedom for the Denominator	Degrees of Freedom for the Numerator																		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**15**	**20**	**25**	**30**	**40**	**50**	**100**
1	161.5	199.5	215.7	224.6	230.2	234.0	236.8	238.9	240.5	241.9	243.0	243.9	246.0	248.0	249.3	250.1	251.1	251.8	253.0
2	18.51	19.00	19.16	19.25	19.30	19.33	19.35	19.37	19.38	19.40	19.40	19.41	19.43	19.45	19.46	19.46	19.47	19.48	19.49
3	10.13	9.55	9.28	9.12	9.01	8.94	8.89	8.85	8.81	8.79	8.76	8.74	8.70	8.66	8.63	8.62	8.59	8.58	8.55
4	7.71	6.94	6.59	6.39	6.26	6.16	6.09	6.04	6.00	5.96	5.94	5.91	5.86	5.80	5.77	5.75	5.72	5.70	5.66
5	6.61	5.79	5.41	5.19	5.05	4.95	4.88	4.82	4.77	4.74	4.70	4.68	4.62	4.56	4.52	4.50	4.46	4.44	4.41
6	5.99	5.14	4.76	4.53	4.39	4.28	4.21	4.15	4.10	4.06	4.03	4.00	3.94	3.87	3.83	3.81	3.77	3.75	3.71
7	5.59	4.74	4.35	4.12	3.97	3.87	3.79	3.73	3.68	3.64	3.60	3.57	3.51	3.44	3.40	3.38	3.34	3.32	3.27
8	5.32	4.46	4.07	3.84	3.69	3.58	3.50	3.44	3.39	3.35	3.31	3.28	3.22	3.15	3.11	3.08	3.04	3.02	2.97
9	5.12	4.26	3.86	3.63	3.48	3.37	3.29	3.23	3.18	3.14	3.10	3.07	3.01	2.94	2.89	2.86	2.83	2.80	2.76
10	4.96	4.10	3.71	3.48	3.33	3.22	3.14	3.07	3.02	2.98	2.94	2.91	2.85	2.77	2.73	2.70	2.66	2.64	2.59
11	4.84	3.98	3.59	3.36	3.20	3.09	3.01	2.95	2.90	2.85	2.82	2.79	2.72	2.65	2.60	2.57	2.53	2.51	2.46
12	4.75	3.89	3.49	3.26	3.11	3.00	2.91	2.85	2.80	2.75	2.72	2.69	2.62	2.54	2.50	2.47	2.43	2.40	2.35
13	4.67	3.81	3.41	3.18	3.03	2.92	2.83	2.77	2.71	2.67	2.63	2.60	2.53	2.46	2.41	2.38	2.34	2.31	2.26
14	4.60	3.74	3.34	3.11	2.96	2.85	2.76	2.70	2.65	2.60	2.57	2.53	2.46	2.39	2.34	2.31	2.27	2.24	2.19
15	4.54	3.68	3.29	3.06	2.90	2.79	2.71	2.64	2.59	2.54	2.51	2.48	2.40	2.33	2.28	2.25	2.20	2.18	2.12
16	4.49	3.63	3.24	3.01	2.85	2.74	2.66	2.59	2.54	2.49	2.46	2.42	2.35	2.28	2.23	2.19	2.15	2.12	2.07
17	4.45	3.59	3.20	2.96	2.81	2.70	2.61	2.55	2.49	2.45	2.41	2.38	2.31	2.23	2.18	2.15	2.10	2.08	2.02
18	4.41	3.55	3.16	2.93	2.77	2.66	2.58	2.51	2.46	2.41	2.37	2.34	2.27	2.19	2.14	2.11	2.06	2.04	1.98
19	4.38	3.52	3.13	2.90	2.74	2.63	2.54	2.48	2.42	2.38	2.34	2.31	2.23	2.16	2.11	2.07	2.03	2.00	1.94
20	4.35	3.49	3.10	2.87	2.71	2.60	2.51	2.45	2.39	2.35	2.31	2.28	2.20	2.12	2.07	2.04	1.99	1.97	1.91
21	4.32	3.47	3.07	2.84	2.68	2.57	2.49	2.42	2.37	2.32	2.28	2.25	2.18	2.10	2.05	2.01	1.96	1.94	1.88
22	4.30	3.44	3.05	2.82	2.66	2.55	2.46	2.40	2.34	2.30	2.26	2.23	2.15	2.07	2.02	1.97	1.94	1.91	1.85
23	4.28	3.42	3.03	2.80	2.64	2.53	2.44	2.37	2.32	2.27	2.24	2.20	2.13	2.05	2.00	1.96	1.91	1.88	1.82
24	4.26	3.40	3.01	2.78	2.62	2.51	2.42	2.36	2.30	2.25	2.22	2.18	2.16	2.03	1.97	1.94	1.89	1.86	1.80
25	4.24	3.39	2.99	2.76	2.60	2.49	2.40	2.34	2.28	2.24	2.20	2.16	2.09	2.01	1.96	1.92	1.87	1.84	1.78
30	4.17	3.32	2.92	2.69	2.53	2.42	2.33	2.27	2.21	2.16	2.13	2.09	2.01	1.93	1.88	1.84	1.79	1.76	1.70
40	4.08	3.23	2.84	2.61	2.45	2.34	2.25	2.18	2.12	2.08	2.04	2.00	1.92	1.84	1.78	1.74	1.69	1.66	1.59
50	4.03	3.18	2.79	2.56	2.40	2.29	2.20	2.13	2.07	2.03	1.99	1.95	1.87	1.78	1.73	1.69	1.63	1.60	1.52
100	3.94	3.09	2.70	2.46	2.31	2.19	2.10	2.03	1.97	1.93	1.89	1.85	1.77	1.68	1.62	1.57	1.52	1.48	1.39

Table VII The *F* Distribution Table (continued)

The entries in this table give the critical values of *F* for .10 area in the right tail under the *F* distribution curve and specified degrees of freedom for the numerator and denominator.



Degrees of Freedom for the Denominator	Degrees of Freedom for the Numerator																		
	1	2	3	4	5	6	7	8	9	10	11	12	15	20	25	30	40	50	100
1	39.86	49.50	53.59	55.83	57.24	58.20	58.91	59.44	59.86	60.19	60.47	60.71	61.22	61.74	62.05	62.26	62.53	62.69	63.01
2	8.53	9.00	9.16	9.24	9.29	9.33	9.35	9.37	9.38	9.39	9.40	9.41	9.42	9.44	9.45	9.46	9.47	9.47	9.48
3	5.54	5.46	5.39	5.34	5.31	5.28	5.27	5.25	5.24	5.23	5.22	5.22	5.20	5.18	5.17	5.17	5.16	5.15	5.14
4	4.54	4.32	4.19	4.11	4.05	4.01	3.98	3.95	3.94	3.92	3.91	3.90	3.87	3.84	3.83	3.82	3.80	3.80	3.78
5	4.06	3.78	3.62	3.52	3.45	3.40	3.37	3.34	3.32	3.30	3.28	3.27	3.24	3.21	3.19	3.17	3.16	3.15	3.13
6	3.78	3.46	3.29	3.18	3.11	3.05	3.01	2.98	2.96	2.94	2.92	2.90	2.87	2.84	2.81	2.80	2.78	2.77	2.75
7	3.59	3.26	3.07	2.96	2.88	2.83	2.78	2.75	2.72	2.70	2.68	2.67	2.63	2.59	2.57	2.56	2.54	2.52	2.50
8	3.46	3.11	2.92	2.81	2.73	2.67	2.62	2.59	2.56	2.54	2.52	2.50	2.46	2.42	2.40	2.38	2.36	2.35	2.32
9	3.36	3.01	2.81	2.69	2.61	2.55	2.51	2.47	2.44	2.42	2.40	2.38	2.34	2.30	2.27	2.25	2.23	2.22	2.19
10	3.29	2.92	2.73	2.61	2.52	2.46	2.41	2.38	2.35	2.32	2.30	2.28	2.24	2.20	2.17	2.16	2.13	2.12	2.09
11	3.23	2.86	2.66	2.54	2.45	2.39	2.34	2.30	2.27	2.25	2.23	2.21	2.17	2.12	2.10	2.08	2.05	2.04	2.01
12	3.18	2.81	2.61	2.48	2.39	2.33	2.28	2.24	2.21	2.19	2.17	2.15	2.10	2.06	2.03	2.01	1.99	1.97	1.94
13	3.14	2.76	2.56	2.43	2.35	2.28	2.23	2.20	2.16	2.14	2.12	2.10	2.05	2.01	1.98	1.96	1.93	1.92	1.88
14	3.10	2.73	2.52	2.39	2.31	2.24	2.19	2.15	2.12	2.10	2.07	2.05	2.01	1.96	1.93	1.91	1.89	1.87	1.83
15	3.07	2.70	2.49	2.36	2.27	2.21	2.16	2.12	2.09	2.06	2.04	2.02	1.97	1.92	1.89	1.87	1.85	1.83	1.79
16	3.05	2.67	2.46	2.33	2.24	2.18	2.13	2.09	2.06	2.03	2.01	1.99	1.94	1.89	1.86	1.84	1.81	1.79	1.76
17	3.03	2.64	2.44	2.31	2.22	2.15	2.10	2.06	2.03	2.00	1.98	1.96	1.91	1.86	1.83	1.81	1.78	1.76	1.73
18	3.01	2.62	2.42	2.29	2.20	2.13	2.08	2.04	2.00	1.98	1.95	1.93	1.89	1.84	1.80	1.78	1.75	1.74	1.70
19	2.99	2.61	2.40	2.27	2.18	2.11	2.06	2.02	1.98	1.96	1.93	1.91	1.86	1.81	1.78	1.76	1.73	1.71	1.67
20	2.97	2.59	2.38	2.25	2.16	2.09	2.04	2.00	1.96	1.94	1.91	1.89	1.84	1.79	1.76	1.74	1.71	1.69	1.65
21	2.96	2.57	2.36	2.23	2.14	2.08	2.02	1.98	1.95	1.92	1.90	1.87	1.83	1.78	1.74	1.72	1.69	1.67	1.63
22	2.95	2.56	2.35	2.22	2.13	2.06	2.01	1.97	1.93	1.90	1.88	1.86	1.81	1.76	1.73	1.70	1.67	1.65	1.61
23	2.94	2.55	2.34	2.21	2.11	2.05	1.99	1.95	1.92	1.89	1.87	1.84	1.80	1.74	1.71	1.69	1.66	1.64	1.59
24	2.93	2.54	2.33	2.19	2.10	2.04	1.98	1.94	1.91	1.88	1.85	1.83	1.78	1.73	1.70	1.67	1.64	1.62	1.58
25	2.92	2.53	2.32	2.18	2.09	2.02	1.97	1.93	1.89	1.87	1.84	1.82	1.77	1.72	1.68	1.66	1.63	1.61	1.56
30	2.88	2.49	2.28	2.14	2.05	1.98	1.93	1.88	1.85	1.82	1.79	1.77	1.72	1.67	1.63	1.61	1.57	1.55	1.51
40	2.84	2.44	2.23	2.09	2.00	1.93	1.87	1.83	1.79	1.76	1.74	1.71	1.66	1.61	1.57	1.54	1.51	1.48	1.43
50	2.81	2.41	2.20	2.06	1.97	1.90	1.84	1.80	1.76	1.73	1.70	1.68	1.63	1.57	1.53	1.50	1.46	1.44	1.39
100	2.76	2.36	2.14	2.00	1.91	1.83	1.78	1.73	1.69	1.66	1.64	1.61	1.56	1.49	1.45	1.42	1.38	1.35	1.29

Appendix

C

Statistical Tables on the Web Site

Note: The following tables are on the Web site of the text along with Chapters 14 and 15.

Table VIII Critical Values of *X* for the Sign Test

Table IX Critical Values of *T* for the Wilcoxon Signed-Rank Test

Table X Critical Values of *T* for the Wilcoxon Rank Sum Test

Table XI Critical Values for the Spearman Rho Rank Correlation Coefficient Test

Table XII Critical Values for a Two-Tailed Runs Test with $\alpha = .05$

ANSWERS TO SELECTED ODD-NUMBERED EXERCISES AND SELF-REVIEW TESTS

(Note: Due to differences in rounding, the answers obtained by readers may differ slightly from the ones given in this Appendix.)

Chapter 1

1.7 **a.** population **b.** sample **c.** population **d.** sample **e.** population

1.11 **a.** number of dog bites reported last year **b.** six observations **c.** six elements

1.15 **a.** quantitative **b.** quantitative **c.** qualitative **d.** quantitative **e.** quantitative

1.17 **a.** discrete **b.** continuous **d.** discrete **e.** continuous

1.21 **a.** cross-section data **b.** cross-section data **c.** time-series data **d.** time-series data

1.23 **a.** $\Sigma f = 69$ **b.** $\Sigma m^2 = 1363$ **c.** $\Sigma mf = 922$ **d.** $\Sigma m^2 f = 17{,}128$

1.25 **a.** $\Sigma x = 112$ **b.** $\Sigma y = 45$ **c.** $\Sigma xy = 222$ **d.** $\Sigma y^2 = 285$ **e.** $(\Sigma y)^2 = 2025$

1.27 **a.** $\Sigma x = 856$ **b.** $(\Sigma x)^2 = 732{,}736$ **c.** $\Sigma x^2 = 157{,}574$

1.29 **a.** $\Sigma x = 148$ **b.** $(\Sigma x)^2 = 21{,}904$ **c.** $\Sigma x^2 = 4486$

1.33 **a.** sample **b.** population for the year **c.** sample **d.** population

1.35 **a.** sampling without replacement **b.** sampling with replacement

1.37 **a.** $\Sigma x = 47$ **b.** $(\Sigma x)^2 = 2209$ **c.** $\Sigma x^2 = 443$

1.39 **a.** $\Sigma m = 59$ **b.** $\Sigma f^2 = 2662$ **c.** $\Sigma mf = 1508$ **d.** $\Sigma m^2 f = 24{,}884$ **e.** $\Sigma m^2 = 867$

Self-Review Test

1. b **2.** c **3.** **a.** sampling without replacement **b.** sampling with replacement

4. **a.** qualitative **b.** quantitative (continuous) **c.** quantitative (discrete) **d.** qualitative

6. **a.** $\Sigma x = 29$ **b.** $(\Sigma x)^2 = 841$ **c.** $\Sigma x^2 = 231$

7. **a.** $\Sigma m = 45$ **b.** $\Sigma f = 112$ **c.** $\Sigma m^2 = 495$ **d.** $\Sigma mf = 975$ **e.** $\Sigma m^2 f = 9855$ **f.** $\Sigma f^2 = 2994$

Chapter 2

2.3 **c.** 26.7% **d.** 73.4%

2.5 **c.** 52% **2.7** **c.** 50% **2.15** **d.** 62%

2.17 **a.** class limits: \$1–\$25, \$26–\$50, \$51–\$75, \$76–\$100, \$101–\$125, \$126–\$150 **b.** class boundaries: \$.5, \$25.5, \$50.5, \$75.5, \$100.5, \$125.5, \$150.5; width = \$25 **c.** class midpoints: \$13, \$38, \$63, \$88, \$113, \$138

2.19 **d.** 30% **2.29** **c.** 11

2.35 **c.** 38% **e.** about 52% **2.43** 6 teams

2.47 218, 245, 256, 329, 367, 383, 397, 404, 427, 433, 471, 523, 537, 551, 563, 581, 592, 622, 636, 647, 655, 678, 689, 810, 841

2.67 **d.** 27.5% **2.69** **c.** 16.7% **2.71** **c.** 56.7%

2.73 **d.** Boundaries of the fourth class are \$4200.5 and \$5600.5; width = \$1400.

2.87 No. The older group may drive more miles per week than the younger group.

Self-Review Test

2. **a.** 5 **b.** 7 **c.** 17 **d.** 6.5 **e.** 13 **f.** 90 **g.** .30

4. **c.** 35% **5.** **c.** 70.8%

8. 30, 33, 37, 42, 44, 46, 47, 49, 51, 53, 53, 56, 60, 67, 67, 71, 79

Chapter 3

3.5 mode **3.9** mean = 3.00; median = 3.50; no mode

3.11 mean = \$3779.44; median = \$3250

3.13 **a.** mean = \$272.98 billion; median = \$162 billion **b.** mode = \$34 billion and \$216 billion

3.15 mean = £48.515 million; median = £37.6 million

3.17 mean = \$529.67 million; median = \$449.5 million; no mode

3.19 mean = 2.92 power outages; median = 2.5 power outages; mode = 2 power outages

3.21 mean = 29.4; median = 28.5; mode = 23

3.23 **a.** mean = 1803; median = 1270 **b.** outlier = 5490; when the outlier is dropped: mean = 1467.8; median = 1166; mean changes by a larger amount **c.** median

3.25 combined mean = \$148.89 **3.27** total = \$1055

3.29 age of the sixth person = 48 years

3.31 mean for data set I = 24.60; mean for data set II = 31.60 The mean of the second data set is equal to the mean of the first data set plus 7.

3.33 10% trimmed mean = 38.25 years **3.35** weighted mean = 77.5

3.41 range = 25; $\sigma^2 = 61.5$; $\sigma = 7.84$

3.43 **a.** $\bar{x} = 9$; deviations from the mean: -2, 1, -1, -6, 6, 3, -3, 2. The sum of these deviations is zero. **b.** range = 12; $s^2 = 14.2857$; $s = 3.78$

3.45 range = 13; $s^2 = 13.8409$; $s = 3.72$

3.47 range = 27 pieces; $s^2 = 78.1$; $s = 8.84$ pieces
3.49 range = 7 stings; $s^2 = 4.5769$; $s = 2.14$ stings
3.51 range = 30; $s^2 = 107.4286$; $s = 10.36$
3.53 range = 38; $s^2 = 151.7778$; $s = 12.3198$
3.55 $s = 0$
3.57 CV for salaries = 10.94%; CV for years of experience = 13.33%; The relative variation in salaries is lower.
3.59 $s = 14.64$ for both data sets
3.63 $\bar{x} = 9.40$; $s^2 = 37.7114$; $s = 6.14$
3.65 $\mu = 14$ hours; $\sigma^2 = 51.9167$; $\sigma = 7.21$ hours
3.67 $\bar{x} = 19.67$; $s^2 = 67.6979$; $s = 8.23$
3.69 $\bar{x} = 36.80$ minutes; $s^2 = 597.7143$; $s = 24.45$ minutes
3.71 **a.** $\bar{x} = \$139.05$ **c.** $\bar{x} = \$138.93$
3.75 at least 75%; at least 84%; at least 89%
3.77 68%; 95%; 99.7%
3.79 **a.** at least 75% **b.** at least 84% **c.** at least 89%
3.81 **a.** **i.** at least 75% **ii.** at least 89% **b.** \$1515 to \$3215
3.83 **a.** 99.7% **b.** 68% **c.** 95%
3.85 **a.** **i.** 99.7% **ii.** 68% **b.** 66 to 78 mph
3.91 **a.** $Q_1 = 69$; $Q_2 = 73$; $Q_3 = 76.5$; $IQR = 7.5$ **b.** $P_{35} = 70$ **c.** 30.77%
3.93 **a.** $Q_1 = 369$; $Q_2 = 386.5$; $Q_3 = 417$; $IQR = 48$ **b.** $P_{57} = 390$ **c.** 73.33%
3.95 **a.** $Q_1 = 25$; $Q_2 = 28.5$; $Q_3 = 33$; $IQR = 8$ **b.** $P_{65} = 31$ **c.** 33.33%
3.97 **a.** $Q_1 = 533$; $Q_2 = 626.5$; $Q_3 = 728$; $IQR = 195$ **b.** $P_{30} = 552.5$ **c.** 23%
3.99 no outlier
3.109 **a.** mean = \$106.5 thousand; median = \$76 thousand **b.** outlier = 382; when the outlier is dropped: mean = \$75.9 thousand ; median = \$74 thousand; mean changes by a larger amount **c.** median
3.111 **a.** mean = 1973.6 points; median = 1917.5 points; mode none **b.** range = 544 points; $s^2 = 42084.93$; $s = 205.15$ points
3.113 $\bar{x} = 5.08$ inches; $s^2 = 6.8506$; $s = 2.62$ inches
3.115 **a.** **i.** at least 75% **ii.** at least 89% **b.** 160 to 240 minutes
3.117 **a.** **i.** 68% **ii.** 95% **b.** 140 to 260 minutes
3.119 **a.** $Q_1 = 60$; $Q_2 = 76$; $Q_3 = 97$; $IQR = 37$ **b.** $P_{70} = 84$ **c.** 70%
3.121 The data set is skewed slightly to the right; 135 is an outlier.
3.123 The minimum score is 169.
3.125 **a.** new mean = 76.4 inches; new median = 78 inches; new range = 13 inches **b.** new mean = 75.2 inches
3.127 mean = \$54.46 per barrel
3.129 **a.** trimmed mean = 9.5 **b.** 14.3%
3.131 **a.** age 30 and under: rate for A = 25; rate for B = 20 **b.** age 31 and over: rate for A = 100; rate for B = 85.7 **c.** overall: rate for A = 50; rate for B = 58.3 **d.** Country A has the lower overall average because 66.67% of its population is under 30.
3.133 **a.** $k = 1.41$ **b.** $k = 2.24$ **3.135** **b.** median
3.137 **b.** For men: mean = 82, median = 79, modes = 75, 79, and 92, $s = 12.08$, $Q_1 = 73.5$, $Q_3 = 89.5$, and $IQR = 16$. For women: mean = 97.53, median = 98, modes = 94 and 100, $s = 8.44$, $Q_1 = 94$, $Q_3 = 101$, and $IQR = 7$
3.139 **a.** mean = 30 **b.** mean = 50
3.141 **a.** at least 55.56% **b.** 1 to 11 inches **c.** 2.66 to 9.34 inches
3.143 **a.** For men: mean = 174.91 lbs = 76,189.05 grams = 12.49 stone, median = 179 lbs = 77,970.61 grams = 12.79 stone, and st. dev. = 19.12 lbs = 8328.48 grams = 1.37 stone. For women: mean = 124.95 lbs = 54,426.97 grams = 8.93 stone, median = 123 lbs = 53,577.57 grams = 8.79 stone, st. dev. = 17.48 lbs = 7614.11 grams = 1.25 stone. **b.** see answer to a, as answers are identical. **c.** yes **d** & **e.** Smaller unit has more variability.
3.145 108 to 111

Self-Review Test

1. b **2.** a and d **3.** c **4.** c **5.** b
6. b **7.** a **8.** a **9.** b **10.** a **11.** b
12. c **13.** a **14.** a
15. mean = 10.9; median = 8; mode = 6; range = 26; $s^2 = 65.2111$; $s = 8.08$
19. **b.** $\bar{x} = 19.46$; $s^2 = 44.0400$; $s = 6.64$
20. **a.** **i.** at least 84% **ii.** at least 89% **b.** 2.9 to 11.7 years
21. **a.** **i.** 68% **ii.** 99.7% **b.** 2.9 to 11.7 years
22. **a.** $Q_1 = 3$; $Q_2 = 8$; $Q_3 = 13$; $IQR = 10$ **b.** $P_{60} = 10$ **c.** 66.67%
23. Data are skewed slightly to the right.
24. combined mean = \$1066.43
25. GPA of fifth student = 3.17
26. 10% trimmed mean = 376.625; trimmed mean is a better measure
27. **a.** mean for data set I = 19.75; mean for data set II = 16.75. The mean of the second data set is equal to the mean of the first data set minus 3. **b.** $s = 11.32$ for both data sets.

Chapter 4

4.3 S = {AB, AC, BA, BC, CA, CB}
4.5 four possible outcomes; S = {NN, NI, IN, II}
4.7 four possible outcomes; S = {DD, DG, GD, GG}
4.9 S = {HHH, HHT, HTH, HTT, THH, THT, TTH, TTT}
4.11 **a.** {NI and IN}; a compound event **b.** {II, NI, and IN}; a compound event **c.** {NN, IN, and NI}; a compound event **d.** {IN}; a simple event
4.13 **a.** {DG, GD, and GG}; a compound event **b.** {DG and GD}; a compound event **c.** {GD}; a simple event **d.** {DD, DG, and GD}; a compound event
4.19 $-.55$, 1.56, $5/3$, $-2/7$
4.21 not equally likely events; use relative frequency approach
4.23 subjective probability
4.25 **a.** .450 **b.** .550 **4.27** .660 **4.29** .160
4.31 **a.** .200 **b.** .800 **4.33** .6667; .3333
4.35 .325; .675 **4.37** **a.** .0939 **b.** .5
4.39 use relative frequency approach **4.45** 1296
4.47 **a.** no **b.** no **c.** $\overline{A} = \{1, 3, 4, 6, 8\}$; $\overline{B} = \{1, 3, 5, 6, 7\}$; $P(\overline{A}) = .625$; $P(\overline{B}) = .625$
4.49 50 **4.51** 960 **4.53** **a.** **i.** .600 **ii.** .600 **iii.** .375 **iv.** .583 **b.** Events "male" and "female" are mutually exclusive. Events "have shopped" and "male" are not mutually exclusive. **c.** Events "female" and "have shopped" are dependent.

4.55 a. i. .3475 ii. .5425 iii. .2727 iv. .4545 b. Events "male" and "in favor" are not mutually exclusive. Events "in favor" and "against" are mutually exclusive. c. Events "female" and "no opinion" are dependent.
4.57 a. i. .1012 ii. .4835 iii. .5524 iv. .1014 b. Events "Airline A" and "more than 1 hour late" are not mutually exclusive. Events "less than 30 minutes late" and "more than one hour late" are mutually exclusive. c. Events "Airline B" and "30 minutes to 1 hour late" are dependent.
4.59 Events "female" and "pediatrician" are dependent but not mutually exclusive.
4.61 Events "female" and "business major" are dependent but not mutually exclusive.
4.63 $P(A) = .3333$; $P(\overline{A}) = .6667$ **4.65** .88
4.71 a. .4543 b. .0980
4.73 a. .1520 b. .1824
4.75 a. .2462 b. .1086
4.77 .6923 **4.79** .725
4.81 a. i. .3844 ii. .1590 b. .0000
4.83 a. i. .350 ii. .150
4.85 a. i. .225 ii. .035 b. .0000
4.87 .3529 **4.89** .2667 **4.91** .1600
4.93 a. .0025 b. .9025 **4.95** .5120
4.97 .5278 **4.99** .40
4.105 a. .56 b. .76 **4.107** a. .52 b. .67
4.109 a. .6358 b. .9075
4.111 a. .750 b. .750 c. 1.0
4.113 a. .780 b. .550 c. .790
4.115 .910 **4.117** .77
4.119 .700 **4.121** .80 **4.123** .9744
4.125 a. .2571 b. .1429
4.127 a. i. .4360 ii. .4800 iii. .3462 iv. .6809 v. .3400 vi. .6600 b. Events "female" and "prefers watching sports" are dependent but not mutually exclusive.
4.129 a. i. .750 ii. .700 iii. .225 iv. .775 b. Events "student athlete" and "should be paid" are dependent but not mutually exclusive.
4.131 a. .7242 b. .2758 **4.133** .0605
4.135 .0048 **4.137** a. 17,576,000 b. 5200
4.139 a. $1/195{,}249{,}054 = .0000000051$ b. $1/5{,}138{,}133 = .00000019$
4.141 a. .5000 b. .3333 c. No; the sixth toss is independent of the first five tosses. Equivalent to part a.
4.143 a. .030 b. .150
4.145 a. .50 b. .50 **4.147** a. .8333 b. .1667
4.149 a. .01% b. i. .0048 ii. .0028 iii. .0222 iv. .0111 **4.151** a. .8851 b. .0035

Self-Review Test

1. a **2.** b **3.** c **4.** a **5.** a **6.** b
7. c **8.** b **9.** b **10.** c **11.** b
12. 120 **13.** a. .3333 b. .6667
14. a. Events "female" and "out of state" are dependent but not mutually exclusive. b. i. .4500 ii. .6364
15. .825 **16.** .3894 **17.** .4225 **18.** .40; .60
19. a. .279 b. .829
20. a. i. .358 ii. .405 iii. .235 iv. .5593 b. Events "woman" and "yes" are dependent but not mutually exclusive.

Chapter 5

5.3 a. discrete random variable b. continuous random variable c. continuous random variable d. discrete random variable e. discrete random variable f. continuous random variable
5.5 discrete random variable
5.9 a. not a valid probability distribution b. a valid probability distribution c. not a valid probability distribution
5.11 a. .17 b. .20 c. .58 d. .42 e. .42 f. .27 g. .68
5.13 b. i. .51 ii. .235 iii. .285 iv. .305
5.15 a.

x	1	2	3	4	5
$P(x)$	.10	.25	.30	.20	.15

b. approximate c. i. .30 ii. .65 iii. .75 iv. .65
5.17

x	0	1	2
$P(x)$	.5271	.3978	.0751

5.19

x	0	1	2
$P(x)$	.3969	.4662	.1369

5.21

x	0	1	2
$P(x)$	.4789	.4422	.0789

5.23 a. $\mu = 1.590$; $\sigma = .960$ b. $\mu = 7.070$; $\sigma = 1.061$
5.25 $\mu = .440$ error; $\sigma = .852$ error
5.27 $\mu = 2.94$ camcorders; $\sigma = 1.441$ camcorders
5.29 $\mu = 1.00$ head; $\sigma = .707$ head
5.31 $\mu = 2.5604$ tires; $\sigma = 1.3223$ tires
5.33 $\mu = .100$ lemon; $\sigma = .308$ lemon
5.35 $\mu = \$3.9$ million; $\sigma = \$3.015$ million
5.37 $\mu = .500$ person; $\sigma = .584$ person
5.39 $3! = 6$; $(9-3)! = 720$; $9! = 362{,}880$; $(14-12)! = 2$; ${}_5C_3 = 10$; ${}_7C_4 = 35$; ${}_9C_3 = 84$; ${}_4C_0 = 1$; ${}_3C_3 = 1$; ${}_6P_2 = 30$; ${}_8P_4 = 1680$
5.41 ${}_9C_2 = 36$; ${}_9P_2 = 72$ **5.43** ${}_{12}C_3 = 220$; ${}_{12}P_3 = 1320$
5.45 ${}_{20}C_6 = 38{,}760$; ${}_{20}P_6 = 27{,}907{,}200$
5.47 167,960
5.51 a. not a binomial experiment b. a binomial experiment c. a binomial experiment
5.53 a. .2541 b. .1536 c. .3241
5.55 b. $\mu = 2.100$; $\sigma = 1.212$
5.59 a. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 b. .1161
5.61 a. .0314 b. .3552 c. .8076
5.63 a. .0913 b. .0000 c. .0122
5.65 a. .2725 b. .0839
5.67 a. $\mu = 5.6$ customers; $\sigma = 1.058$ customers b. .1147
5.69 a. $\mu = 5.600$ customers; $\sigma = 1.296$ customers b. .0467
5.71 a. .4286 b. .0714 c. .5
5.73 a. .3818 b. .0030 c. .5303
5.75 a. .4747; b. .0440 c. .3407
5.77 a. .1078 b. .5147 c. .8628
5.81 a. .0404 b. .2565
5.83 a. $\mu = 1.3$; $\sigma^2 = 1.3$; $\sigma = 1.140$ b. $\mu = 2.1$; $\sigma^2 = 2.1$; $\sigma = 1.449$

5.85 .1496 **5.87** .1185
5.89 **a.** .1162 **b.** **i.** .6625 **ii.** .1699 **iii.** .4941
5.91 **a.** .3033 **b.** **i.** .0900 **ii.** .0018 **iii.** .9098
5.93 **a.** .0031 **b.** **i.** .0039 **ii.** .4911
5.95 **a.** .2466 **c.** $\mu = 1.4$ $\sigma^2 = 1.4$ $\sigma = 1.183$
5.97 **a.** .0446 **b.** **i.** .0390 **ii.** .2580 **iii.** .0218
5.99 $\mu = 4.11$; $\sigma = 1.019$; This mechanic repairs, on average, 4.11 cars per day
5.101 **b.** $\mu = \$557{,}000$; $\sigma = \$1{,}288{,}274$; μ gives the company's expected profit.
5.103 **a.** .0000 **b.** .0351 **c.** .7214
5.105 **a.** .9246 **b.** .0754
5.107 **a.** .3692 **b.** .1429 **c.** .0923
5.109 **a.** .8643 **b.** .1357
5.111 **a.** .0912 **b.** **i.** .5502 **ii.** .0817 **iii.** .2933
5.113 **a.** .2466
5.115 $\Sigma x\,P(x) = -2.22$. This game is not fair to you and you should not play as you expect to lose \$2.22.
5.117 **a.** .0625 **b.** .125 **c.** .3125
5.119 **c.** .7149 **d.** 3 nights
5.121 8 cheesecakes
5.123 **a.** 35 **b.** 10 **c.** .2857 **5.127** \$6
5.129 **a.** .0211 **b.** .0475 **c.** .4226

Self-Review Test

2. probability distribution table
3. a **4.** b **5.** a **7.** b **8.** a
9. b **10.** a **11.** c **13.** a
15. $\mu = 2.040$ homes; $\sigma = 1.449$ homes
16. **a.** **i.** .2128 **ii.** .8418 **iii.** .0153
b. $\mu = 7.2$ adults; $\sigma = 1.697$ adults
17. **a.** .4525 **b.** .0646 **c.** .0666
18. **a.** **i.** .0521 **ii.** .2203 **iii.** .2013

Chapter 6

6.11 .8664 **6.13** .9876
6.15 **a.** .4744 **b.** .4798 **c.** .1162 **d.** .0610 **e.** .9400
6.17 **a.** .0869 **b.** .0244 **c.** .9798 **d.** .9608
6.19 **a.** .5 approximately **b.** .5 approximately **c.** .00 approximately **d.** .00 approximately
6.21 **a.** .9613 **b.** .4783 **c.** .4767 **d.** .0694
6.23 **a.** .0096 **b.** .2466 **c.** .1570 **d.** .9625
6.25 **a.** .8365 **b.** .8947 **c.** approximately .5 **d.** approximately .5 **e.** approximately .00 **f.** approximately .00
6.27 **a.** 1.80 **b.** −2.20 **c.** −1.20 **d.** 2.80
6.29 **a.** .4599 **b.** .1598 **c.** .2223
6.31 **a.** .3336 **b.** .9564 **c.** .9686 **d.** approximately .00
6.33 **a.** .2178 **b.** .6440
6.35 **a.** .8212 **b.** .2810 **c.** .0401 **d.** .7190
6.37 **a.** .0764 **b.** .1126
6.39 **a.** .0985 **b.** .0538
6.41 **a.** 93.32% **b.** 15.57%
6.43 **a.** .0197 **b.** .3296
6.45 **a.** .8264 **b.** 12.83%
6.47 **a.** 15.62% **b.** 7.64%
6.49 **a.** 0.39% **b.** 1.46% **c.** 18.72% **d.** 29.21%
6.51 2.64%
6.53 **a.** 2.00 **b.** −2.02 approximately **c.** −.37 approximately **d.** 1.02 approximately
6.55 **a.** approximately 1.65 **b.** −1.96 **c.** −2.33 approximately **d.** 2.58 approximately
6.57 **a.** 208.50 **b.** 241.25 **c.** 178.50 **d.** 145.75 **e.** 158.25 **f.** 251.25
6.59 19 minutes approximately
6.61 2060 kilowatt-hours
6.63 \$82.02 approximately
6.65 $np > 5$ and $nq > 5$
6.67 **a.** .7688 **b.** .7697; difference is .0009
6.69 **a.** $\mu = 72$; $\sigma = 5.36656315$ **b.** .3192 **c.** .4564
6.71 **a.** .0764 **b.** .6793 **c.** .8413 **d.** .8238
6.73 .0735 **6.75** **a.** .0351 **b.** .1875 **c.** .1230
6.77 **a.** .0454 **b.** .0516 **c.** .8646
6.79 **a.** .7549 **b.** .2451
6.81 **a.** .1093 **b.** 9.31% **c.** 57.33% **d.** It is possible, but its probability is close to zero.
6.83 .0124 or 1.24%
6.85 **a.** 848 hours **b.** 792 hours approximately
6.87 **a.** .0454 **b.** .0838 **c.** .8861 **d.** .2477
6.89 \$2136 **6.91** **a.** 85.08% **b.** \$4000
6.93 .0091
6.95 **a.** at most .0062 **b.** 65 mph
6.97 8.16 ounces
6.99 company A: \$.0490 company B: \$.0508
6.101 **a.** .7967 **b.** 62
6.105 .1064

Self-Review Test

1. a **2.** a **3.** d **4.** b **5.** a **6.** c
7. b **8.** b
9. **a.** .1878 **b.** .9304 **c.** .0985 **d.** .7704
10. **a.** −1.28 approximately **b.** .61 **c.** 1.65 approximately **d.** −1.07 approximately
11. **a.** .5608 **b.** .0015 **c.** .0170 **d.** .1165
12. **a.** 48669.8 **b.** 40162
13. **a.** **i.** .0318 **ii.** .9453 **iii.** .9099 **iv.** .0268 **v.** .4632 **b.** .7054 **c.** .3986

Chapter 7

7.5 **a.** 16.60 **b.** sampling error = −.27 **c.** sampling error = −.27; nonsampling error = 1.11 **d.** $\bar{x}_1 = 16.22$; $\bar{x}_2 = 15.67$; $\bar{x}_3 = 17.00$; $\bar{x}_4 = 16.33$; $\bar{x}_5 = 17.44$; $\bar{x}_6 = 16.78$; $\bar{x}_7 = 17.22$; $\bar{x}_8 = 17.67$; $\bar{x}_9 = 16.56$; $\bar{x}_{10} = 15.11$
7.7 **b.** $\bar{x}_1 = 28.4$; $\bar{x}_2 = 28.8$; $\bar{x}_3 = 33.8$; $\bar{x}_4 = 34.4$; $\bar{x}_5 = 35.2$; $\bar{x}_6 = 36.4$; **c.** $\mu = 32.83$
7.13 **a.** $\mu_{\bar{x}} = 60$; $\sigma_{\bar{x}} = 2.357$
b. $\mu_{\bar{x}} = 60$; $\sigma_{\bar{x}} = 1.054$
7.15 **a.** $\sigma_{\bar{x}} = 1.400$ **b.** $\sigma_{\bar{x}} = 2.500$

7.17 **a.** $n = 100$ **b.** $n = 256$
7.19 $\mu_{\bar{x}} = \$3.084$; $\sigma_{\bar{x}} = \$.038$
7.21 $\mu_{\bar{x}} = \$520$; $\sigma_{\bar{x}} = \$14.40$ **7.23** $n = 256$
7.25 **a.** $\mu_{\bar{x}} = 80.60$ **b.** $\sigma_{\bar{x}} = 3.302$
d. $\sigma_{\bar{x}} = 3.302$
7.33 $\mu_{\bar{x}} = 20.20$ hours; $\sigma_{\bar{x}} = .613$ hours; the normal distribution
7.35 $\mu_{\bar{x}} = 3.020$; $\sigma_{\bar{x}} = .042$; approximately normal distribution
7.37 $n = 20$: $\mu_{\bar{x}} = 91.4$ grams; $\sigma_{\bar{x}} = 20.851$ grams; skewed to the right
$n = 75$: $\mu_{\bar{x}} = 91.4$ grams; $\sigma_{\bar{x}} = \$10.768$ grams; approximately normal distribution
7.39 $\mu_{\bar{x}} = 200$ pieces; $\sigma_{\bar{x}} = 15.821$ pieces; approximately normal distribution; no, sample size ≥ 30
7.41 86.64%
7.43 **a.** $z = 2.44$ **b.** $z = -7.25$ **c.** $z = -3.65$
d. $z = 5.82$
7.45 **a.** .1940 **b.** .8749
7.47 **a.** .0003 **b.** .9292
7.49 **a.** .1093 **b.** .0322 **c.** .7776
7.51 **a.** .0150 **b.** .0968 **c.** .5696
7.53 **a.** .8203 **b.** .9750
7.55 **a.** .1147 **b.** .9164 **c.** .1251
7.57 **a.** .1032 **b.** .3172 **c.** .0016 **d.** .9049
7.59 .0124 **7.61** $p = .12$; $\hat{p} = .15$
7.63 7125 subjects in the population; 312 subjects in the sample
7.65 sampling error $= -.05$
7.71 **a.** $\mu_{\hat{p}} = .21$; $\sigma_{\hat{p}} = .020$
b. $\mu_{\hat{p}} = .21$; $\sigma_{\hat{p}} = .015$
7.73 **a.** $\sigma_{\hat{p}} = .051$ **b.** $\sigma_{\hat{p}} = .071$
7.77 **a.** $p = .667$ **b.** 6 **d.** $-.067, -.067, .133, .133, -.067, -.067$
7.79 $\mu_{\hat{p}} = .30$; $\sigma_{\hat{p}} = .034$; approximately normal distribution
7.81 $\mu_{\hat{p}} = .561$; $\sigma_{\hat{p}} = .027$; approximately normal distribution
7.83 95.44%
7.85 **a.** $z = -.61$ **b.** $z = 1.83$ **c.** $z = -1.22$
d. $z = 1.22$
7.87 **a.** .0721 **b.** .1798
7.89 **a.** .0030 **b.** .2678
7.91 .2005
7.93 $\mu_{\bar{x}} = 750$ hours; $\sigma_{\bar{x}} = 11$ hours; the normal distribution
7.95 **a.** .9131 **b.** .1698 **c.** .8262 **d.** .0344
7.97 **a.** .489 **b.** .0006 **c.** .8064 **d.** .8643
7.99 $\mu_{\hat{p}} = .88$; $\sigma_{\hat{p}} = .036$; approximately normal distribution
7.101 **a.** **i.** .0146 **ii.** .0907 **b.** .9912 **c.** .0146
7.103 .6318
7.105 10 approximately
7.107 **a.** .8023 **b.** 754 approximately
7.109 .0035

Self-Review Test

1. b **2.** b **3.** a **4.** a **5.** b
6. b **7.** c **8.** a **9.** a
10. a **11.** c **12.** a
14. **a.** $\mu_{\bar{x}} = 145$ pounds; $\sigma_{\bar{x}} = 3.600$ pounds; approximately normal distribution
b. $\mu_{\bar{x}} = 145$ pounds; $\sigma_{\bar{x}} = 1.800$ pounds; approximately normal distribution
15. **a.** $\mu_{\bar{x}} = 45{,}000$ miles; $\sigma_{\bar{x}} = 527.71$ miles; unknown distribution
b. $\mu_{\bar{x}} = 45{,}000$ miles; $\sigma_{\bar{x}} = 292.72$ miles; approximately normal distribution
16. **a.** .1541 **b.** .4582 **c.** .0003 **d.** .1706
e. .0084
17. **a.** **i.** .1203 **ii.** .1335 **iii.** .7486
b. .9736 **c.** .0013
18. **a.** $\mu_{\hat{p}} = .048$; $\sigma_{\hat{p}} = .0302$; unknown distribution
b. $\mu_{\hat{p}} = .048$; $\sigma_{\hat{p}} = .0096$; approximately normal distribution
c. $\mu_{\hat{p}} = .048$; $\sigma_{\hat{p}} = .0030$; approximately normal distribution
19. **a.** **i.** .0080 **ii.** .4466 **iii.** .7823
iv. .2815 **b.** .5820 **c.** .1936 **d.** .0606

Chapter 8

8.11 **a.** 24.5 **b.** 22.71 to 26.29 **c.** ± 1.79
8.13 **a.** 70.59 to 79.01 **b.** 69.80 to 79.80
c. 68.22 to 81.38 **d.** yes
8.15 **a.** 77.84 to 85.96 **b.** 78.27 to 85.53
c. 78.65 to 85.15 **d.** yes
8.17 **a.** 38.34 **b.** 37.30 to 39.38 **c.** ± 1.04
8.19 **a.** $n = 167$ **b.** $n = 65$
8.21 **a.** $n = 299$ **b.** $n = 126$ **c.** $n = 61$
8.23 \$295,146.86 to \$304,293.14
8.25 **a.** 48,903.27 to 58,196.73 labor-hours
8.27 31.86 to 32.02 ounces; no adjustment needed
8.29 **a.** \$1532.41 to \$1617.59
8.31 $n = 167$ **8.33** $n = 61$
8.41 **a.** $t = -1.325$ **b.** $t = 2.160$ **c.** $t = 3.281$
d. $t = -2.715$
8.43 **a.** $\alpha \approx .10$, left tail **b.** $\alpha = .005$, right tail
c. $\alpha = .10$, right tail **d.** $\alpha \approx .01$ left tail
8.45 **a.** $t = 2.080$ **b.** $t = 1.671$ **c.** $t = 2.807$
8.47 **a.** 1.41 **b.** -3.40 to 6.22 **c.** ± 4.81
8.49 **a.** 24.06 to 26.94 **b.** 23.58 to 27.42
c. 23.73 to 27.27
8.51 **a.** 91.03 to 93.87 **b.** 90.06 to 93.44
c. 88.06 to 91.20 **d.** confidence intervals of parts b and c cover μ, that of part a does not
8.53 40.04 to 42.36 bushels
8.55 .32 to .36 grams
8.57 18.64 to 25.36 minutes
8.59 **a.** 21.56 to 24.44 hours
8.61 4.88 to 11.12 hours
8.63 7.20 to 8.14 ounces
8.65 **a.** 6.18 years
b. 5.85 to 6.51 years; margin of error: $\pm .33$ year
8.71 **a.** yes, sample size is large **b.** no, sample size is not large **c.** yes, sample size is large **d.** yes, sample size is large
8.73 **a.** .297 to .343 **b.** .336 to .384
c. .277 to .323 **d.** confidence intervals of parts a and b cover p, but that of part c does not
8.75 **a.** .189 to .351 **b.** .202 to .338
c. .218 to .322 **d.** yes

8.77 a. .284 to .336 b. .269 to .351 c. .209 to .411 d. yes
8.79 a. $n = 668$ b. $n = 671$
8.81 a. $n = 1432$ b. $n = 196$ c. $n = 353$
8.83 a. .29 to .45
8.85 a. 40% b. 33.1% to 46.9%; margin of error = ±6.9%
8.87 a. 20.3% to 55.7% **8.89** a. 12.3% to 17.1%
8.91 a. .333 b. 8.5% to 58.1%
8.93 $n = 1084$
8.95 $n = 1849$
8.99 a. $2640
b. $2514.57 to $2765.43
8.101 3.969 to 4.011 inches; the machine needs to be adjusted
8.103 12.5 to 16.5 gallons
8.105 21.76 to 26.24 minutes
8.107 4.4 to 4.6 hours
8.109 144.33 to 158.47 calories
8.111 a. .03 b. .014 to .046
8.113 6.1% to 56.4%
8.115 $n = 221$ **8.117** $n = 359$
8.121 $n = 65$
8.123 a. $n = 20$ days b. 90% c. ±75 cars

Self-Review Test

1. a. population parameter; sample statistic
b. sample statistic; population parameter
c. sample statistic; population parameter
2. b **3.** a **4.** a **5.** c **6.** b
7. a. $159,000
b. $147,390 to $170,610; margin of error = ± $11,610
8. $379,539.30 to $441,310.70 **9.** a. .55
b. .489 to .611
10. $n = 83$ **11.** $n = 273$ **12.** $n = 229$

Chapter 9

9.5 a. a left-tailed test b. a right-tailed test
c. a two-tailed test
9.7 a. Type II error b. Type I error
9.9 a. H_0: $\mu = 20$ hours; H_1: $\mu \neq 20$ hours; a two-tailed test b. H_0: $\mu = 10$ hours; H_1: $\mu > 10$ hours; a right-tailed test
c. H_0: $\mu = 3$ years; H_1: $\mu \neq 3$ years; a two-tailed test
d. H_0: $\mu = \$1000$; H_1: $\mu < \$1000$; a left-tailed test e. H_0: $\mu = 12$ minutes; H_1: $\mu > 12$ minutes; a right-tailed test
9.17 a. p-value = .0188 b. p-value = .0116
c. p-value = .0087
9.19 a. p-value = .0166 b. no, do not reject H_0
c. yes, reject H_0
9.21 a. rejection region is to the left of −2.58 and to the right of 2.58; nonrejection region is between −2.58 and 2.58
b. rejection region is to the left of −2.58; nonrejection region is to the right of −2.58
c. rejection region is to the right of 1.96; nonrejection region is to the left of 1.96
9.23 Statistically not significant
9.25 a. .10 b. .02 c. .005
9.27 a. observed value of z is .58; critical value of z is ±1.96
b. observed value of z is .58; critical value of z is 1.65
9.29 a. reject H_0 if $z > 1.65$ b. reject H_0 if $z < -1.65$
c. reject H_0 if $z < -1.96$ or $z > 1.96$
9.31 a. critical value: $z = -1.96$; test statistic: $z = -2.67$; reject H_0 b. critical value: $z = -1.96$; test statistic: $z = -1.00$; do not reject H_0
9.33 a. critical values: $z = -1.65$ and 1.65; test statistic: $z = -1.34$; do not reject H_0 b. critical value: $z = -2.33$; test statistic: $z = -6.44$; reject H_0
c. critical value: $z = 1.65$; test statistic: $z = 8.70$; reject H_0
9.35 a. $H_0 : \mu = 45$; $H_1 : \mu < 45$ months; p value = .0170; if $\alpha = .025$ reject H_0 b. test statistic: $z = -2.12$; Critical value: $z = -1.96$; reject H_0
9.37 a. $H_0 : \mu \geq 25$ years; $H_1 < 25$ years; p value = .0418; if $\alpha = .025$, do not reject H_0
b. Critical value: $z = -1.96$; observed value: $z = -1.73$; do not reject H_0
9.39 a. H_0: $\mu = 10$ minutes; H_1: $\mu \neq 10$ minutes; test statistic: $z = -2.11$; p value = .0348 If $\alpha = .02$, do not reject H_0. If $\alpha = .05$, reject H_0. b. Observed value $z = -2.11$; If $\alpha = .02$, critical values: $z = -2.33$ and 2.33; do not reject H_0. If $\alpha = .05$, critical values: $z = -1.96$ and 1.96; reject H_0.
9.41 a. test statistic: $z = -2.33$; p value = .0198; If $\alpha = .01$; do not reject H_0: If $\alpha = .05$, reject H_0.
b. Observed value $z = -2.33$; If $\alpha = .01$, critical values: $z = -2.58$ and 2.58, do not reject H_0: If $\alpha = .05$, critical values: $z = -1.96$ and 1.96; reject H_0.
9.43 a. H_0: $\mu \geq 47.93$ boxes; H_1: $\mu < 47.93$ boxes; critical value: $z = -1.28$; test statistic: $z = -1.16$; do not reject H_0
b. reject H_0.
9.45 a. H_0: $\mu \geq 8$ hours; H_1: $\mu < 8$ hours; critical value: $z = -2.33$; $\alpha = .01$; test statistic: $z = -.68$; p value = .2483 do not reject H_0. b. critical value: $z = -1.96$; test statistic: $z = -.68$; do not reject H_0.
9.49 a. reject H_0 if $t < -2.977$ or $t > 2.977$ b. reject H_0 if $t < -2.797$ c. reject H_0 if $t > 2.080$
9.51 a. critical values: $t = -2.365$ and 2.365; observed value: $t = -2.097$; $.05 < p$ value $< .10$ b. critical value: $t = -1.895$; observed value: $t = -2.097$; $.025 < p$ value $< .05$
9.53 a. reject H_0 if $t > 1.672$ b. reject H_0 if $t < -1.672$
c. reject H_0 if $t < -2.002$ or $t > 2.002$
9.55 a. critical value: $t = 1.998$; test statistic: $t = 4.800$; reject H_0 b. critical value: $t = 1.998$; test statistic: $t = 1.143$; do not reject H_0
9.57 a. critical value: $t = -1.363$; test statistic: $t = -1.252$; do not reject H_0 b. critical values: $t = -2.064$ and 2.064; test statistic: $t = 2.258$; reject H_0 c. critical value: $t = 3.143$; test statistic: $t = 2.658$; do not reject H_0
9.59 H_0: $\mu \leq 4.145$ minutes; H_1: $\mu > 4.145$ minutes; critical value: $t = 1.301$; test statistic: $t = 1.862$; reject H_0; $.025 < p$ value $< .05$; reject H_0
9.61 H_0: $\mu = \$850$; H_1: $\mu < \$850$; critical value: $t = -2.397$; test statistic: $t = -2.257$; do not reject H_0; if $\alpha = .025$, critical value $= -2.005$; reject H_0
9.63 H_0: $\mu = 14.325$ homes; H_1: $\mu \neq 14.325$ homes; test statistic: $t = -.752$; p-value $> .10$; do not reject H_0; for $\alpha = .05$, critical values: $t = -2.020$ and $t = 2.020$; test statistic: $t = -.752$; do not reject H_0

9.65 **a.** H_0: $\mu \geq \$150$; H_1: $\mu < \$150$; test statistic: $t = -1.964$; $.025 < p\text{-value} < .050$; do not reject H_0; for $\alpha = .01$, critical value: $t = -2.492$; test statistic: $t = -1.964$; do not reject H_0 **b.** $\alpha = .01$

9.67 **a.** H_0: $\mu = 58$ years; H_1: $\mu \neq 58$ years; if $\alpha = 0$, do not reject H_0 **b.** test statistic: $t = -4.183$; p-value $< .002$; for $\alpha = .01$, reject H_0; critical values: $t = -2.649$ and 2.649; test statistic: $t = -4.183$; reject H_0

9.69 H_0: $\mu = \$95$; H_1: $\mu > \$95$; critical value: $t = 1.771$; test statistic: $t = 2.130$; reject H_0

9.71 H_0: $\mu = \$3.084$; H_1: $\mu < \$3.084$; test statistic: $t = -2.024$; $.01 < p$ value $< .025$; do not reject H_0; critical value: $t = -2.326$; do not reject H_0

9.75 **a.** not large enough **b.** large enough **c.** not large enough **d.** large enough

9.77 **a.** reject H_0 if $z < -1.65$ or $z > 1.65$ **b.** reject H_0 if $z < -2.33$ **c.** reject H_0 if $z > 1.65$

9.79 **a.** critical value: $z = 1.65$; observed value: $z = 3.90$
b. critical values: $z = -1.96$ and 1.96; observed value: $z = 3.90$

9.81 **a.** reject H_0 if $z < -1.65$ **b.** reject H_0 if $z < -1.96$ or $z > 1.96$ **c.** reject H_0 if $z > 1.65$

9.83 **a.** critical values: $z = -2.58$ and 2.58; test statistic: $z = -1.07$; do not reject H_0 **b.** critical values: $z = -2.58$ and 2.58; test statistic: $z = 3.21$; reject H_0

9.85 **a.** critical values: $z = -1.65$ and 1.65; test statistic: $z = .80$; do not reject H_0 **b.** critical value: $z = -1.65$; test statistic: $z = -4.71$; reject H_0 **c.** critical value: $z = 2.33$; test statistic: $z = .93$; do not reject H_0

9.87 H_0: $p = .30$; H_1: $p < .30$; test statistic: $z = -1.75$; p value $= .0401$; for $\alpha = .05$, reject H_0; critical value for $\alpha = .05$: $z = -1.65$; test statistic: $z = -1.75$; reject H_0

9.89 H_0: $p = .67$; H_1: $p > .67$; critical value: $z = 2.05$; test statistic: $z = 3.15$; reject H_0; p-value $= .0009$; for $\alpha = .02$, reject H_0

9.91 H_0: $p = .231$; $H_1 = p > .231$; critical value: $z = 1.65$; test statistic: $z = .97$; do not reject H_0; p value $= .1660$; for $\alpha = .05$, do not reject H_0

9.93 **a.** H_0: $p \geq .35$; H_1: $p < .35$; critical value: $z = -1.96$; test statistic: $z = -2.94$; reject H_0 **b.** do not reject H_0 **c.** $\alpha = .025$; p value $= .0016$; reject H_0

9.95 **a.** critical value: $z = 1.96$; test statistic: $z = 2.27$; reject H_0; adjust machine **b.** critical value: $z = 2.33$; test statistic: $z = 2.27$; do not reject H_0; do not adjust the machine

9.99 **a.** critical value: $z = 1.96$; test statistic: $z = 2.10$; reject H_0 **b.** P(Type I error) $= .025$
c. p-value $= .0179$; do not reject H_0 if $\alpha = .01$; reject H_0 if $\alpha = .05$

9.101 **a.** critical values: $z = -2.33$ and 2.33; test statistic: $z = 2.55$; reject H_0 **b.** P(Type I error) $= .02$
c. p-value $= .0108$; reject H_0 if $\alpha = .025$; do not reject H_0 if $\alpha = .005$

9.103 **a.** H_0: $\mu = 67.2$ minutes; H_1: $\mu > 67.2$ minutes; test statistic: $z = 4.98$; p value $< .0002$; if $\alpha = .05$, reject H_0
b. critical value: $z = 2.33$; test statistic: $z = 4.98$; reject H_0

9.105 **a.** H_0: $\mu \geq 50$; H_1: $\mu < 50$; critical value of $z = -1.96$; test statistic: $z = -3.00$; reject H_0
b. P(Type I error) $= .025$ **c.** do not reject H_0
d. p-value $= .0013$; for $\alpha = .025$, reject H_0

9.107 **a.** H_0: $\mu \leq 2400$ square feet; H_1: $\mu > 2400$ square feet; critical value: $t = 1.677$; test statistic: $t = 2.097$; reject H_0
b. for $\alpha = .01$ critical value: $t = 2.405$; test statistic: $t = 2.097$; do not reject H_0

9.109 H_0: $\mu \leq 15$ minutes; H_1: $\mu > 15$ minutes; critical value: $t = 2.438$; test statistic: $t = 1.875$; do not reject H_0

9.111 H_0: $\mu = 25$ minutes; H_1: $\mu \neq 25$ minutes; critical values: $t = -2.947$ and 2.947; test statistic: $t = 2.083$; do not reject H_0

9.113 **a.** H_0: $\mu \leq 2$ hours; H_1: $\mu > 2$ hours; critical value: $t = 2.718$; test statistic: $t = 1.679$; do not reject H_0

9.115 **a.** H_0: $p = .5$; H_1: $p \neq .5$; critical values: $z = -1.96$ and 1.96; test statistic: $z = 1.52$; do not reject H_0
b. P(Type I error) $= .05$ **c.** $\alpha = .05$; p-value $= .1286$; do not reject H_0.

9.117 H_0: $p = .40$; H_1: $p \neq .40$; critical values: $z = -2.58$ and 2.58; test statistic: $z = -1.62$; do not reject H_0; p-value $= .1052$; do not reject H_0

9.119 **a.** H_0: $p = .80$; H_1: $p < .80$; critical value: $z = -2.33$; test statistic: $z = -.79$; do not reject H_0
b. do not reject H_0

9.121 **a.** .0238 **b.** $\alpha = .0238$

9.123 $\alpha = .3446$

9.125 H_0: $\mu = 750$ hours; H_1: $\mu < 750$ hours; reject H_0 if $\bar{x} < 735$: $\alpha = .0082$; reject H_0 if $\bar{x} < 700$: $\alpha = .0000$

9.129 **a.** 29 or more, or 11 or less **b.** 226 or more, or 174 or less **c.** 2081 or more, or 1919 or less

Self-Review Test

1. a **2.** b **3.** a **4.** b **5.** a **6.** a
7. a **8.** b **9.** c **10.** a **11.** c **12.** b
13. c **14.** a **15.** b

16. **a.** H_0: $\mu = 90.25$ ozs; H_1: $\mu \neq 90.25$ ozs; critical values: $z = -2.58$ and 2.58; test statistic: $z = -3.18$; reject H_0
b. H_0: $\mu = 90.25$ ozs; H_1: $\mu > 90.25$ ozs; critical value: $z = -1.96$; test statistic: $z = -3.18$; reject H_0 **c.** in part a, $\alpha = .01$; in part b, $\alpha = .025$ **d.** p-value $= .0014$, reject H_0 **e.** p-value $= .0007$, reject H_0

17. **a.** H_0: $\mu = 185$; H_1: $\mu < 185$; critical value: $t = -2.438$ test statistic: $t = -3.000$; reject H_0 **b.** P(Type I error) $= .01$ **c.** do not reject H_0 **d.** $.001 < p$-value $< .005$; for $\alpha = .01$, reject H_0

18. **a.** H_0: $\mu \geq 31$ months; H_1: $\mu < 31$ months; critical value: $t = -2.131$; test statistic: $t = -3.333$; reject H_0
b. P(Type I error) $= .025$ **c.** critical value: $t = -3.733$; do not reject H_0

19. **a.** H_0: $p = .5$; H_1: $p < .5$; critical value: $z = -1.65$; test statistic: $z = -3.16$; reject H_0 **b.** P(Type I error) $= .05$
c. do not reject H_0 **d.** p-value $= .0008$; reject H_0 if $\alpha = .05$; reject H_0 if $\alpha = .01$

Chapter 10

10.3 **a.** 1.83; **b.** $-.72$ to 4.38; margin of error $= \pm 2.55$

10.5 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $z = -1.96$ and 1.96; test statistic: $z = 1.85$; do not reject H_0

10.7 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $z = -1.65$; test statistic: $z = -1.47$; do not reject H_0

10.9 **a.** 9 hours **b.** 1.65 to 16.35 hours; **c.** H_0 : $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $z = -2.33$

and 2.33; test statistic: $z = 2.66$; reject H_0; p-value = .0078; for $\alpha = .02$, reject H_0

10.11 **a.** .74 **b.** .373 to 1.11 **c.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: 2.33; test statistic: $z = 3.95$; reject H_0; p value = .0000; for $\alpha = .01$, reject H_0

10.13 **a.** −$1024.54 to −$75.46 **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $z = -2.58$ and 2.58; test statistic: $z = -2.99$; reject H_0 **c.** do not reject H_0

10.15 **a.** −6.87 to .87 calories **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $z = -2.58$; test statistic: $z = -1.81$; do not reject H_0 **c.** p value = .0351; do not reject H_0 for $\alpha = .005$; do not reject H_0 for $\alpha = .025$

10.17 **a.** −1.58 **b.** −3.82 to .66

10.19 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -2.023$ and 2.023; test statistic $t = -1.430$; do not reject H_0

10.21 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.426$; test statistic: $t = -1.430$; do not reject H_0

10.23 **a.** 2.62 **b.** −5.85 to 11.09 **c.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.500$; test statistic: $t = .77$; do not reject H_0

10.25 **a.** −46.80 to −7.20 miles; **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.326$; test statistic: $t = -2.67$; reject H_0

10.27 **a.** 2.29 to 5.71 mph **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.416$; test statistic: $t = 5.658$; reject H_0

10.29 **a.** −12.95 to 2.95 minutes **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.412$; test statistic: $t = -1.691$; do not reject H_0

10.31 **a.** −.61 to −.39 **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -2.576$ and 2.576; test statistic: $t = -10.130$; reject H_0

10.33 −7.86 to −1.04

10.35 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -2.101$ and 2.101; test statistic: $t = -2.740$; do not reject H_0

10.37 H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.552$; test statistic: $t = -2.740$; reject H_0

10.39 **a.** −47.01 to −6.99 miles; **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.326$; test statistic: $t = -2.64$; reject H_0 **c.** −48.30 to −5.70; critical value: $t = -2.397$; test statistic: $t = -2.54$; reject H_0

10.41 **a.** 2.23 to 5.77 mph **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.445$; test statistic: $t = 5.513$; reject H_0 **c.** 1.81 to 6.20 mph; critical value: $t = 2.492$; test statistic: $t = 4.541$; reject H_0

10.43 **a.** −12.86 to 2.86 minutes **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.414$; test statistic: $t = -1.713$; do not reject H_0 **c.** −13.34 to 3.34 minutes; critical value: $t = -2.431$; test statistic: $t = -1.63$; do not reject H_0

10.45 **a.** −.61 to −.39 **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -2.576$ and 2.576; test statistic: $t = -10.162$; reject H_0 **c.** −.62 to −.38; critical values: $t = -2.576$ and 2.576; test statistic: $t = -10.10$; reject H_0

10.49 **a.** 11.85 to 23.15 **b.** 50.08 to 61.72; **c.** 25.66 to 32.94

10.51 **a.** critical values: $t = -2.060$ and 2.060; test statistic: $t = 12.551$; reject H_0 **b.** critical value: $t = 2.624$; test statistic: $t = 7.252$; reject H_0 **c.** critical value: $t = -1.328$; test statistic: $t = -14.389$; reject H_0

10.53 **a.** −2.98 to 9.84 minutes **b.** H_0: $\mu_d = 0$; H_1: $\mu_d > 0$; critical value: $t = 2.447$; test statistic: $t = 1.983$; do not reject H_0

10.55 **a.** 13.22 to 30.01 seconds **b.** H_0: $\mu_d < +15$; H_1: μ_d +15; critical value: $t = 1.356$; test statistic: $t = 1.72$, reject H_0

10.57 **a.** −1.02 to 1.52 **b.** H_0: $\mu_d = 0$; H_1: $\mu_d \neq 0$; critical values: $t = -2.093$ and 2.093; test statistic: $t = .4122$; do not reject H_0

10.61 −.062 to .142

10.63 H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -1.96$ and 1.96; test statistic: $z = .76$; do not reject H_0

10.65 H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 > 0$; critical value: $z = 2.05$; test statistic: $z = .76$; do not reject H_0

10.67 **a.** −.04 **b.** −.086 to .006 **c.** rejection region to the left of $z = -2.33$; non-rejection region to the right of $z = -2.33$ **d.** test statistic: $z = -2.02$ **e.** do not reject H_0

10.69 **a.** − .025 to .225 **b.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 < 0$; critical values: $z = 1.96$ and −1.96; test statistic: $z = 1.56$; do not reject H_0; p value =.1188; for $\alpha = .025$, do not reject H_0 **c.** .012 to .188; critical values: $z = -1.96$ and 1.96; test statistic: $z = 2.20$; reject H_0; p value =.0278; for $\alpha = .05$, reject H_0

10.71 **a.** .024 **b.** −.020 to .068 **c.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -1.96$ and 1.96; test statistic: $z = 1.09$; do not reject H_0; p-value = .2758; for $\alpha = .05$, do not reject H_0

10.73 **a.** .10 **b.** .018 to .182 **c.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -2.58$ and 2.58; test statistic: $z = 3.04$; reject H_0

10.75 **a.** −.013 to .093 **b.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 > 0$; critical value: $z = 2.33$ test statistic: $z = 1.75$; do not reject H_0

10.77 **a.** −$119.16 to −$114.84 **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $z = -1.96$; test statistic: $z = -106.25$; reject H_0

10.79 **a.** −.086 to .160 fatalities **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.326$; test statistic: $t = .70$; do not reject H_0

10.81 **a.** −8.42 to −1.82 cards **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -1.645$ and 1.645; test statistic: $t = -3.04$; reject H_0

10.83 **a.** −.085 to.159 fatalities; H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.326$; test statistic: $t = .71$; do not reject H_0 **b.** −.076 to .150 fatalities; H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $t = 2.326$; test statistic: $t = .76$; do not reject H_0

10.85 **a.** −8.35 to −1.89 cards; H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical value: $t = -1.645$ and 1.645; test statistic: $t = -3.11$; reject H_0 **b.** −8.55 to −1.69 cards; H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 \neq 0$; critical values: $t = -1.645$ and 1.645; test statistic: $t = -2.93$; reject H_0

10.87 **a.** −9.54 to −.24 **b.** H_0: $\mu_d = 0$; H_1: $\mu_d < 0$; critical value: $t = -2.896$; test statistic: $t = -2.425$; do not reject H_0

10.89 **a.** Ind-Rep: −.106 to .046; Ind-Dem: .080 to .220; Rep-Dem: .103 to .257 **b.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -2.58$ and 2.58; test statistic: $z = -.77$; do not reject H_0 **c.** p value = .4412; for $\alpha = .01$, do not reject H_0

10.91 **a.** $-.142$ to $-.018$ **b.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -1.96$ and $z = 1.96$; test statistic: $z = -2.11$; reject H_0

10.93 .2611

10.95 $n = 9$

10.97 **a.** $n = 545$ **b.** .8708

10.101 **a.** .3564 **b.** .0793 **c.** .0013

Self-Review Test

1. a

3. **a.** 1.62 to 2.78 **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 > 0$; critical value: $z = 1.96$; test statistic: $z = 9.86$; reject H_0

4. **a.** -2.72 to -1.88 hours **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.416$; test statistic: $t = -10.997$; reject H_0

5. **a.** -2.70 to -1.90 hours **b.** H_0: $\mu_1 - \mu_2 = 0$; H_1: $\mu_1 - \mu_2 < 0$; critical value: $t = -2.421$; test statistic: $t = -11.474$; reject H_0

6. **a.** $-\$53.60$ to $\$186.18$ **b.** H_0: $\mu_d = 0$; H_1: $\mu_d \neq 0$; critical values: $t = -2.447$ and 2.447; test statistic: $t = 2.050$; do not reject H_0

7. **a.** $-.052$ to .092 **b.** H_0: $p_1 - p_2 = 0$; H_1: $p_1 - p_2 \neq 0$; critical values: $z = -2.58$ and 2.58; test statistic: $z = .60$; do not reject H_0

Chapter 11

11.3 $\chi^2 = 41.337$ **11.5** $\chi^2 = 41.638$

11.7 **a.** $\chi^2 = 5.009$ **b.** $\chi^2 = 3.565$

11.13 critical value: $\chi^2 = 11.070$; test statistic: $\chi^2 = 5.200$; do not reject H_0

11.15 critical value: $\chi^2 = 7.815$; test statistic: $\chi^2 = 45.844$; reject H_0

11.17 critical value: $\chi^2 = 13.277$; test statistic: $\chi^2 = 19.328$; reject H_0

11.19 critical value: $\chi^2 = 9.488$; test statistic: $\chi^2 = 6.752$; do not reject H_0

11.21 critical value: $\chi^2 = 9.348$; test statistic: $\chi^2 = 65.087$; reject H_0

11.27 **a.** H_0: the proportion in each row is the same for all four populations;
H_1: the proportion in each row is not the same for all four populations
c. critical value: $\chi^2 = 14.449$ **d.** test statistic: $\chi^2 = 52.451$ **e.** reject H_0

11.29 critical value: $\chi^2 = 5.024$; test statistic: $\chi^2 = 1.980$; do not reject H_0

11.31 **a.** critical value: $\chi^2 = 6.635$; test statistic: $\chi^2 = 8.647$; reject H_0 **b.** critical value: $x^2 = 6.635$; test statistic: $x^2 = 17.317$; reject H_0

11.33 critical value: $\chi^2 = 7.815$; test statistic: $\chi^2 = 2.587$; do not reject H_0

11.35 critical value: $\chi^2 = 6.635$; test statistic: $\chi^2 = 8.178$; reject H_0

11.37 critical value: $\chi^2 = 7.815$; test statistic: $\chi^2 = 8.221$; reject H_0

11.39 critical value: $\chi^2 = 7.378$; test statistic: $\chi^2 = 2.404$; do not reject H_0

11.41 **a.** 18.4376 to 84.9686 **b.** 21.3393 to 67.7365 **c.** 23.0674 to 60.6586

11.43 **a.** H_0: $\sigma^2 = 1.75$; H_1: $\sigma^2 > 1.75$ **b.** reject H_0 if $\chi^2 > 34.170$ **c.** test statistic: $\chi^2 = 22.514$ **d.** do not reject H_0

11.45 **a.** H_0: $\sigma^2 = 2.2$; H_1: $\sigma^2 \neq 2.2$ **b.** reject H_0 if $\chi^2 < 7.564$ or $\chi^2 > 30.191$ **c.** test statistic: $\chi^2 = 35.545$ **d.** reject H_0

11.47 **a.** .8120 to 3.3160; .9011 to 1.8210 **b.** H_0: $\sigma^2 \leq 1.0$; H_1: $\sigma^2 > 1.0$; critical value: $\chi^2 = 41.638$; test statistic: $\chi^2 = 33.81$; do not reject H_0

11.49 **a.** 2739.3051 to 12,623.9126; 52.338 to 112.356
b. H_0: $\sigma^2 = 4200$; H_1: $\sigma^2 \neq 4200$; critical values: $\chi^2 = 12.401$ and 39.364; test statistic: $\chi^2 = 29.714$; do not reject H_0

11.51 critical value: $\chi^2 = 7.815$; test statistic: $\chi^2 = 10.464$; reject H_0

11.53 critical value: $\chi^2 = 11.143$; test statistic: $\chi^2 = 22.359$; reject H_0

11.55 critical value: $\chi^2 = 11.345$; test statistic: $\chi^2 = 15.920$; reject H_0

11.57 critical value: $\chi^2 = 13,277$; test statistic: $\chi^2 = 50.355$; reject H_0

11.59 critical value: $\chi^2 = 4.605$; test statistic: $\chi^2 = 13.593$; reject H_0

11.61 critical value: $\chi^2 = 16.812$; test statistic: $\chi^2 = 10.181$; do not reject H_0

11.63 **a.** 3.4064 to 24.0000; 1.846 to 4.899 **b.** 8.3336 to 33.2628; 2.887 to 5.767

11.65 H_0: $\sigma^2 = 1.1$; H_1: $\sigma^2 > 1.1$; critical value: $\chi^2 = 28.845$; test statistic: $\chi^2 = 24.727$; do not reject H_0

11.67 H_0: $\sigma^2 = 10.4$; H_1: $\sigma^2 \neq 10.4$; critical values: $\chi^2 = 7.564$ and 30.191; test statistic: $\chi^2 = 24.192$; do not reject H_0

11.69 **a.** H_0: $\sigma^2 = 5000$; H_1: $\sigma^2 < 5000$; critical value: $\chi^2 = 8.907$; test statistic: $\chi^2 = 12.065$; do not reject H_0
b. 1666.8509 to 7903.1835; 40.827 to 88.900

11.71 **a.** .1001 to .4613; .316 to .679 **b.** H_0: $\sigma^2 = .13$; H_1: $\sigma^2 \neq .13$; critical values: $\chi^2 = 9.886$ and 45.559; test statistic: $\chi^2 = 35.077$; do not reject H_0

11.73 **a.** $s^2 = 1840.6964$ **b.** 804.6509 to 7624.1864; 28.366 to 87.317 **c.** H_0: $\sigma^2 = 750$; H_1: $\sigma^2 \neq 750$; critical values: $\chi^2 = 1.690$ and 16.013; test statistic: $\chi^2 = 17.180$; reject H_0

11.75 critical value: $\chi^2 = 5.991$; test statistic: $\chi^2 = 12.931$; reject H_0

11.77 critical value: $\chi^2 = 9.488$; test statistic: $\chi^2 = 6.857$; do not reject H_0

11.79 critical value: $\chi^2 = 16.919$; test statistic: $\chi^2 = 215.568$; reject H_0

11.81 **a.** test statistic: $\chi^2 = 2.480$; p-value $> .10$ **b.** no

Self-Review Test

1. b **2.** a **3.** c **4.** a **5.** b **6.** b
7. c **8.** b **9.** a

10. critical value: $\chi^2 = 11.070$; test statistic: $\chi^2 = 20.146$; reject H_0

11. critical value: $\chi^2 = 11.345$; test statistic: $\chi^2 = 31.188$; reject H_0

12. critical value: $\chi^2 = 9.488$; test statistic: $\chi^2 = 82.450$; reject H_0

13. **a.** .2364 to 1.3326; .486 to 1.154 **b.** H_0: $\sigma^2 = .25$; H_1: $\sigma^2 > .25$; critical value: $\chi^2 = 36.191$; test statistic: $\chi^2 = 36.480$; reject H_0

Chapter 12

12.3 **a.** 7.26 **b.** 5.82 **c.** 5.27
12.5 **a.** 9.00 **b.** 2.59 **c.** 1.79
12.7 **a.** 9.96 **b.** 6.57 **12.9** **a.** 4.85 **b.** 3.22
12.13 **a.** $\bar{x}_1 = 15$; $\bar{x}_2 = 11$; $s_1 = 4.50924975$; $s_2 = 4.39696865$ **b.** H_0: $\mu_1 = \mu_2$; H_1: $\mu_1 \neq \mu_2$; critical values: $t = -2.179$ and 2.179; test statistic: $t = 1.680$; do not reject H_0 **c.** critical value: $F = 4.75$; test statistic: $F = 2.82$; do not reject H_0 **d.** conclusions are the same
12.15 **b.** critical value: $F = 3.29$; test statistic: $F = 4.07$; reject H_0
12.17 **a.** H_0: $\mu_1 = \mu_2 = \mu_3 = \mu_4$; H_1: all four population means are not equal **b.** numerator: $df = 3$; denominator: $df = 28$ **c.** $SSB = .0105$; $SSW = 1.1449$; $SST = 1.1554$ **d.** reject H_0 if $F > 4.58$ **e.** $MSB = .0035$; $MSW = .0409$ **f.** critical value: $F = 4.58$ **g.** test statistic: $F = .0856$ **i.** do not reject H_0
12.19 critical value: $F = 3.55$; test statistic: $F = 2.09$; do not reject H_0
12.21 critical value: $F = 3.72$; test statistic: $F = 5.44$; reject H_0
12.23 **a.** critical value: $F = 2.05$; test statistic: $F = 2.12$; reject H_0 **b.** .10
12.25 **a.** critical value: $F = 6.93$; test statistic: $F = 1.24$; do not reject H_0
12.27 **a.** critical value: $F = 3.89$; test statistic: $F = 4.89$; reject H_0 **b.** do not reject H_0
12.29 critical value: F is 5.29; test statistic: $F = .57$; do not reject H_0
12.33 **a.** 5 groups with 10 members each. **b.** 36 members each.

Self-Review Test

1. a **2.** b **3.** c **4.** a **5.** a
6. a **7.** b **8.** a
10. **a.** critical value: $F = 3.10$; test statistic: $F = 4.46$; reject H_0 **b.** Type I error

Chapter 13

13.15 **a.** y-intercept = 100; slope = 5; positive relationship **b.** y-intercept = 400; slope = −4; negative relationship
13.17 $\mu_{y|x} = -5.5815 + .2886x$
13.19 $\hat{y} = -83.7140 + 10.5714x$
13.21 **a.** \$70.00 **b.** the same amount **c.** exact relationship
13.23 **a.** \$27.10 million **b.** different amounts **c.** nonexact relationship
13.25 **b.** $\hat{y} = 322.4483 - 34.4425x$ **e.** 8135.10 **f.** −\$29,751.72
13.27 **b.** $\hat{y} = 191.6238 - 25.3714x$ **e.** 112.9724 **f.** −62.0905
13.29 **a.** $\mu_{y|x} = 630.6627 + 1.2289x$ **b.** population regression line because data set includes all 16 National League teams; values of A and B **d.** 734 runs
13.35 $\sigma_\epsilon = 7.0756$; $\rho^2 = .04$
13.37 $s_e = 4.7117$; $r^2 = .99$
13.39 **a.** $SS_{xx} = 64$; $SS_{yy} = 93636.8889$; $SS_{xy} = 2283.8$ **b.** $s_e = 41.6463$ **c.** SST = 93636.8889; SSE = 12140.9133; SSR = 81495.9756 **d.** $r^2 = .87$
13.41 **a.** $s_e = 31.2410$ **b.** $r^2 = .45$
13.43 **a.** $s_e = .7832$ **b.** $r^2 = .70$
13.45 **a.** $\sigma_\epsilon = 68.1073$ **b.** $\rho^2 = .02$
13.47 **a.** 6.01 to 6.63 **b.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 2.145$; test statistic: $t = 59.792$; reject H_0 **c.** H_0: $B = 0$; H_1: $B \neq 0$; critical values: $t = -2.977$ and 2.977; test statistic: $t = 59.792$; reject H_0 **d.** H_0: $B = 4.50$; H_1: $B \neq 4.50$; critical values: $t = -2.624$ and 2.624; test statistic: $t = 17.219$; reject H_0
13.49 **a.** 2.35 to 2.65 **b.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 1.960$; test statistic: $t = 39.124$; reject H_0; **c.** H_0: $B = 0$; H_1: $B \neq 0$; critical values: $t = -2.576$ and 2.576; test statistic: $t = 39.124$; reject H_0; **d.** H_0: $B \leq 1.75$; H_1: $B > 1.75$; critical value: $t = 2.326$; test statistic: $t = 11.737$; reject H_0
13.51 **a.** −40.3095 to −28.5756 **b.** H_0: $B = 0$; H_1: $B < 0$; critical value: $t = -1.943$; test statistic: $t = -14.3654$; reject H_0
13.53 **a.** $\hat{y} = 2.4377x + 25.5536$ **b.** 1.331 to 3.5443 **c.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 2.365$; test statistic: $t = 6.6042$; reject H_0
13.55 **a.** −30.5005 to −20.2424 **b.** H_0: $B = 0$; H_1: $B < 0$; critical value: $t = -2.764$; test statistic: $t = -15.6759$; reject H_0
13.57 **a.** $\hat{y} = 4.4300 + 1.1403x$ **b.** .7041 to 1.5765 **c.** H_0: $B = 1.0$; H_1: $B \neq 1.0$; critical values: $t = -2.228$ and 2.228; test statistic: $t = .72$; do not reject H_0
13.63 a **13.67** **a.** positive **b.** positive **c.** positive **d.** negative **e.** zero
13.69 $\rho = .21$
13.71 **a.** $r = -.996$ **b.** H_0: $\rho = 0$; H_1: $\rho < 0$; critical value: $t = -2.764$; test statistic: $t = -35.249$; reject H_0
13.73 **a.** positively **b.** $r = .93$ **c.** H_0: $\rho = 0$; H_1: $\rho > 0$; critical value: $t = 1.895$; test statistic: $t = 6.694$; reject H_0
13.75 **a.** positively **b.** close to 1 **c.** $r = .97$ **d.** H_0: $\rho = 0$; H_1: $\rho \neq 0$; critical values: $t = -2.776$ and 2.776; test statistic: $t = 7.980$; reject H_0
13.77 **a.** $r = .93$ **b.** H_0: $\rho = 0$; H_1: $\rho \neq 0$; critical values: $t = -3.499$ and 3.499; test statistic: $t = 6.694$; reject H_0
13.79 $\rho = .16$
13.81 **a.** $SS_{xx} = 750$; $SS_{yy} = 2502.6667$; $SS_{xy} = 710$ **b.** $\hat{y} = 24.8 + .9467x$ **d.** $r = .52$; $r^2 = .27$ **f.** \$93.91 **g.** $s_e = 13.5297$ **h.** −.15 to 2.05 **i.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 1.812$; test statistic: $t = 1.916$; reject H_0 **j.** H_0: $\rho = 0$; H_1: $\rho > 0$; critical value: $t = 2.228$; test statistic: $t = 1.925$; do not reject H_0
13.83 **a.** $SS_{xx} = 6394.9$; $SS_{yy} = 1718.9$; $SS_{xy} = 3136.1$ **b.** $\hat{y} = -22.5355 + .4904x$ **d.** $r = .95$; $r^2 = .89$ **e.** $s_e = 4.7557$ **f.** .291 to .690 **g.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 2.896$; test statistic: $t = 8.246$; reject H_0 **h.** H_0: $\rho = 0$; H_1: $\rho \neq 0$; critical values: $t = -3.355$ and 3.355; test statistic: $t = 8.605$; reject H_0
13.85 **a.** $SS_{xx} = 3.3647$; $SS_{yy} = 788$; $SS_{xy} = 49.4$ **b.** $\hat{y} = 2.8562 + 14.6819x$ **d.** $r = .96$; $r^2 = .92$ **e.** $s_e = 3.5416$ **f.** 9.718 to 19.646 **g.** H_0: $B = 0$; H_1: $B \neq 0$; critical values: $t = -4.032$ and 4.032; test statistic: $t = 7.6043$; reject H_0 **h.** H_0: $\rho = 0$; H_1: $\rho > 0$; critical value: $t = 3.365$; test statistic: $t = 7.6665$; reject H_0

13.87 **a.** 13.8708 to 16.6292; 11.7648 to 18.7352
b. 62.3590 to 67.7210; 56.3623 to 73.7177
13.89 $4611.38 to $5374.78; $3808.78 to $6177.38
13.91 $77.63 to $95.03; $54.96 to $117.71
13.93 $1518.85 to $2212.88; $715.60 to $3016.13
13.95 **a.** positive relationship
b. $\hat{y} = -1.9172 + .9895x$ **d.** $r = .97$; $r^2 = .94$
e. $s_e = 1.0941$ **f.** .54 to 1.44
g. H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 2.571$; test statistic: $t = 8.808$; reject H_0 **h.** H_0: $\rho = 0$; H_1: $\rho > 0$; critical value: $t = 2.571$; test statistic: $t = 8.922$; reject H_0; same conclusion
13.97 **a.** positive **b.** $\hat{y} = 7.8304 + .5039x$
d. $r = .89$; $r^2 = .79$ **e.** 2547 **f.** $s_e = 3.3525$
g. .11 to .90 **h.** H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 3.365$; test statistic: $t = 4.278$; reject H_0
i. H_0: $\rho = 0$; H_1: $\rho \neq 0$; critical values: $t = -3.365$ and 3.365; test statistic: $t = 4.365$; reject H_0
13.99 **a.** $SS_{xx} = 144.32$; $SS_{yy} = 3.02329$; $SS_{xy} = -1.356$
b. slightly yes **c.** $\hat{y} = -.2133 - .0094x$
e. $r = -.06$ **f.** −$.29
13.101 **b.** $S_{xx} = 82.5$; $SS_{yy} = .88956$; $SS_{xy} = -3.84$
c. yes **d.** $\hat{y} = 22.1615 - .0465x$ **f.** $r = -.45$
g. 21.65 seconds
13.103 60.7339 to 97.3729; 40.0144 to 118.0924
13.105 1042.7081 to 1153.1345; 953.3648 to 1242.4778
13.107 **a.** yes **b.** 246.4670 to 275.5330 lines
c. 200.0567 to 321.9433 lines **e.** 338 lines
13.111 **a.** increase **b.** decrease **c.** increase
d. $\pm t \cdot s_e \sqrt{\dfrac{n+1}{n}}$
13.113 **a.** $r = .92$; yes

Self-Review Test

1. d **2.** a **3.** b **4.** a **5.** b **6.** b
7. true **8.** true **9.** a **10.** b
15. **a.** The attendence depends on temperature.
b. positive **d.** $\hat{y} = -2.2269 + .2715x$
f. $r = .65$; $r^2 = .42$ **g.** 1407 people
h. $s_e = 3.6172$ **i.** −.30 to .84
j. H_0: $B = 0$; H_1: $B > 0$; critical value: $t = 3.365$; test statistic: $t = 1.904$; do not reject H_0
k. 1055 to 1758 **l.** 412 to 2401
m. H_0: $\rho = 0$; H_1: $\rho > 0$; critical value: $t = 3.365$; test statistic: $t = 1.913$; do not reject H_0

Appendix A

A.7 simple random sample **A.9** **a.** nonrandom sample
b. judgment sample **c.** selection error
A.11 **a.** random sample **b.** simple random sample
c. no
A.13 **a.** nonrandom sample **b.** voluntary response error and selection error
A.15 response error
A.17 **a.** designed experiment **b.** no; would need to know if the women or the doctors who evaluated their health knew which women took aspirin and which were in the control group
A.19 **a.** designed experiment **b.** double-blind study
A.21 designed experiment **A.23** yes
A.25 **b.** observational study **c.** not a double-blind study
A.27 **a.** designed experiment **b.** double-blind study
A.29 **a.** no **b.** no **c.** convenience sample
A.33 **a.** no **b.** nonresponse error and response error
c. above

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INDEX

D

E

M

Q

S

T

W

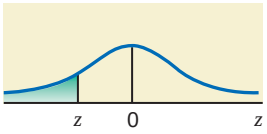
X

Y

Z

Table IV Standard Normal Distribution Table

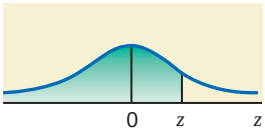
The entries in this table give the cumulative area under the standard normal curve to the left of *z* with the values of *z* equal to 0 or negative.



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.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

Table IV Standard Normal Distribution Table (continued)

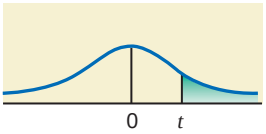
The entries in this table give the cumulative area under the standard normal curve to the left of *z* with the values of *z* equal to 0 or positive.



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

Table V The *t* Distribution Table

The entries in this table give the critical values of *t* for the specified number of degrees of freedom and areas in the right tail.



	Area in the Right Tail under the *t* Distribution Curve					
df	**.10**	**.05**	**.025**	**.01**	**.005**	**.001**
1	3.078	6.314	12.706	31.821	63.657	318.309
2	1.886	2.920	4.303	6.965	9.925	22.327
3	1.638	2.353	3.182	4.541	5.841	10.215
4	1.533	2.132	2.776	3.747	4.604	7.173
5	1.476	2.015	2.571	3.365	4.032	5.893
6	1.440	1.943	2.447	3.143	3.707	5.208
7	1.415	1.895	2.365	2.998	3.499	4.785
8	1.397	1.860	2.306	2.896	3.355	4.501
9	1.383	1.833	2.262	2.821	3.250	4.297
10	1.372	1.812	2.228	2.764	3.169	4.144
11	1.363	1.796	2.201	2.718	3.106	4.025
12	1.356	1.782	2.179	2.681	3.055	3.930
13	1.350	1.771	2.160	2.650	3.012	3.852
14	1.345	1.761	2.145	2.624	2.977	3.787
15	1.341	1.753	2.131	2.602	2.947	3.733
16	1.337	1.746	2.120	2.583	2.921	3.686
17	1.333	1.740	2.110	2.567	2.898	3.646
18	1.330	1.734	2.101	2.552	2.878	3.610
19	1.328	1.729	2.093	2.539	2.861	3.579
20	1.325	1.725	2.086	2.528	2.845	3.552
21	1.323	1.721	2.080	2.518	2.831	3.527
22	1.321	1.717	2.074	2.508	2.819	3.505
23	1.319	1.714	2.069	2.500	2.807	3.485
24	1.318	1.711	2.064	2.492	2.797	3.467
25	1.316	1.708	2.060	2.485	2.787	3.450
26	1.315	1.706	2.056	2.479	2.779	3.435
27	1.314	1.703	2.052	2.473	2.771	3.421
28	1.313	1.701	2.048	2.467	2.763	3.408
29	1.311	1.699	2.045	2.462	2.756	3.396
30	1.310	1.697	2.042	2.457	2.750	3.385
31	1.309	1.696	2.040	2.453	2.744	3.375
32	1.309	1.694	2.037	2.449	2.738	3.365
33	1.308	1.692	2.035	2.445	2.733	3.356
34	1.307	1.691	2.032	2.441	2.728	3.348
35	1.306	1.690	2.030	2.438	2.724	3.340

Table V The *t* Distribution Table (continued)

	Area in the Right Tail under the *t* Distribution Curve					
df	**.10**	**.05**	**.025**	**.01**	**.005**	**.001**
36	1.306	1.688	2.028	2.434	2.719	3.333
37	1.305	1.687	2.026	2.431	2.715	3.326
38	1.304	1.686	2.024	2.429	2.712	3.319
39	1.304	1.685	2.023	2.426	2.708	3.313
40	1.303	1.684	2.021	2.423	2.704	3.307
41	1.303	1.683	2.020	2.421	2.701	3.301
42	1.302	1.682	2.018	2.418	2.698	3.296
43	1.302	1.681	2.017	2.416	2.695	3.291
44	1.301	1.680	2.015	2.414	2.692	3.286
45	1.301	1.679	2.014	2.412	2.690	3.281
46	1.300	1.679	2.013	2.410	2.687	3.277
47	1.300	1.678	2.012	2.408	2.685	3.273
48	1.299	1.677	2.011	2.407	2.682	3.269
49	1.299	1.677	2.010	2.405	2.680	3.265
50	1.299	1.676	2.009	2.403	2.678	3.261
51	1.298	1.675	2.008	2.402	2.676	3.258
52	1.298	1.675	2.007	2.400	2.674	3.255
53	1.298	1.674	2.006	2.399	2.672	3.251
54	1.297	1.674	2.005	2.397	2.670	3.248
55	1.297	1.673	2.004	2.396	2.668	3.245
56	1.297	1.673	2.003	2.395	2.667	3.242
57	1.297	1.672	2.002	2.394	2.665	3.239
58	1.296	1.672	2.002	2.392	2.663	3.237
59	1.296	1.671	2.001	2.391	2.662	3.234
60	1.296	1.671	2.000	2.390	2.660	3.232
61	1.296	1.670	2.000	2.389	2.659	3.229
62	1.295	1.670	1.999	2.388	2.657	3.227
63	1.295	1.669	1.998	2.387	2.656	3.225
64	1.295	1.669	1.998	2.386	2.655	3.223
65	1.295	1.669	1.997	2.385	2.654	3.220
66	1.295	1.668	1.997	2.384	2.652	3.218
67	1.294	1.668	1.996	2.383	2.651	3.216
68	1.294	1.668	1.995	2.382	2.650	3.214
69	1.294	1.667	1.995	2.382	2.649	3.213
70	1.294	1.667	1.994	2.381	2.648	3.211
71	1.294	1.667	1.994	2.380	2.647	3.209
72	1.293	1.666	1.993	2.379	2.646	3.207
73	1.293	1.666	1.993	2.379	2.645	3.206
74	1.293	1.666	1.993	2.378	2.644	3.204
75	1.293	1.665	1.992	2.377	2.643	3.202
∞	1.282	1.645	1.960	2.326	2.576	3.090