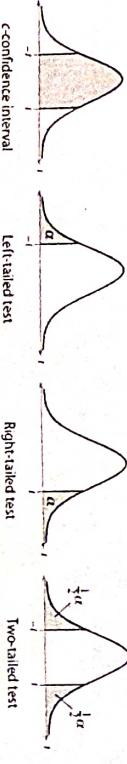
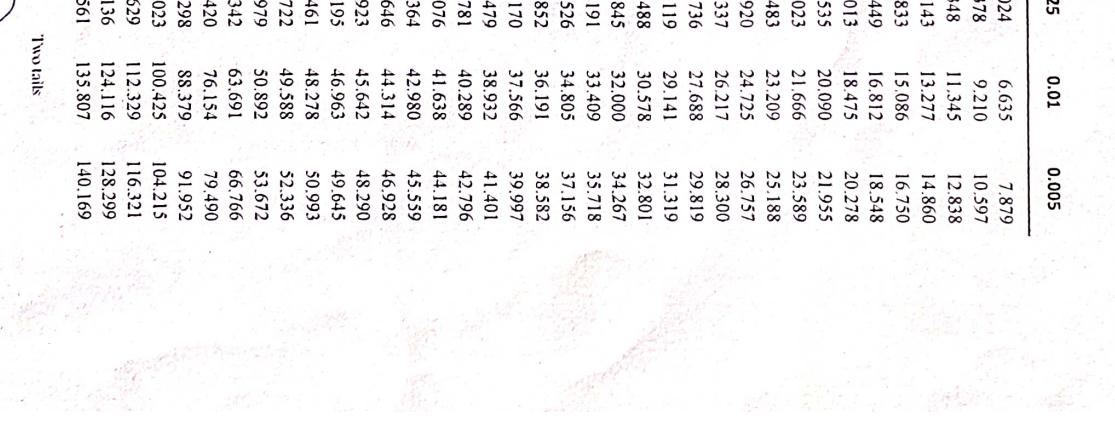


Student t Distribution Probabilities Table

one-tail area		0.25	0.125	0.1	0.075	0.05	0.025	0.01	0.005	0.0005
two-tail area		0.5	0.25	0.2	0.15	0.1	0.05	0.02	0.01	0.001
confidence level		0.5	0.75	0.8	0.85	0.9	0.95	0.98	0.99	0.999
d.f.	1	1.000	2.414	3.078	4.165	6.314	12.706	31.821	63.657	636.619
2	0.816	1.604	1.886	2.282	2.920	4.303	6.965	9.925	31.599	
3	0.765	1.423	1.638	1.924	2.353	3.182	4.541	5.841	12.924	
4	0.741	1.344	1.533	1.778	2.132	2.776	3.747	4.604	8.610	
5	0.727	1.301	1.476	1.699	2.015	2.571	3.365	4.032	6.869	
6	0.718	1.273	1.440	1.650	1.913	2.447	3.143	3.707	5.959	
7	0.711	1.254	1.415	1.617	1.895	2.365	2.998	3.499	5.408	
8	0.706	1.240	1.397	1.592	1.860	2.306	2.896	3.355	5.041	
9	0.703	1.250	1.383	1.574	1.833	2.362	2.821	3.250	4.781	
10	0.700	1.221	1.372	1.559	1.812	2.228	2.764	3.169	4.587	
11	0.697	1.214	1.363	1.548	1.795	2.201	2.718	3.106	4.437	
12	0.695	1.209	1.356	1.538	1.782	2.179	2.681	3.055	4.318	
13	0.694	1.204	1.350	1.530	1.771	2.160	2.650	3.012	4.221	
14	0.692	1.200	1.345	1.523	1.761	2.145	2.624	2.977	4.140	
15	0.691	1.197	1.341	1.517	1.753	2.131	2.602	2.947	4.073	
16	0.690	1.194	1.337	1.512	1.746	2.120	2.583	2.921	4.015	
17	0.689	1.191	1.333	1.508	1.740	2.110	2.567	2.898	3.965	
18	0.688	1.189	1.330	1.504	1.734	2.101	2.552	2.878	3.922	
19	0.688	1.187	1.328	1.500	1.729	2.093	2.539	2.861	3.883	
20	0.687	1.185	1.325	1.497	1.725	2.086	2.528	2.845	3.850	
21	0.686	1.183	1.323	1.494	1.721	2.080	2.518	2.831	3.819	
22	0.686	1.182	1.321	1.492	1.717	2.074	2.508	2.819	3.792	
23	0.685	1.180	1.319	1.489	1.714	2.069	2.500	2.807	3.768	
24	0.685	1.179	1.318	1.487	1.711	2.064	2.492	2.797	3.745	
25	0.684	1.178	1.316	1.485	1.708	2.060	2.485	2.787	3.725	
26	0.684	1.177	1.315	1.483	1.706	2.056	2.479	2.779	3.707	
27	0.684	1.176	1.314	1.482	1.703	2.052	2.473	2.771	3.690	
28	0.683	1.175	1.313	1.480	1.701	2.048	2.467	2.763	3.674	
29	0.683	1.174	1.311	1.479	1.699	2.045	2.462	2.756	3.659	
30	0.683	1.173	1.310	1.477	1.697	2.042	2.457	2.750	3.646	
35	0.682	1.170	1.306	1.472	1.690	2.030	2.438	2.724	3.591	
40	0.681	1.167	1.303	1.468	1.684	2.021	2.423	2.704	3.551	
45	0.680	1.165	1.301	1.465	1.679	2.014	2.412	2.690	3.520	
50	0.679	1.164	1.299	1.462	1.676	2.009	2.403	2.678	3.496	
60	0.679	1.162	1.296	1.458	1.671	2.000	2.390	2.660	3.460	
70	0.678	1.160	1.294	1.456	1.667	1.994	2.381	2.648	3.435	
80	0.678	1.159	1.292	1.453	1.664	1.990	2.374	2.639	3.416	
100	0.677	1.157	1.290	1.451	1.660	1.984	2.364	2.626	3.390	
100	0.675	1.152	1.283	1.442	1.668	1.965	2.354	2.586	3.310	
1000	0.675	1.151	1.282	1.441	1.664	1.962	2.330	2.581	3.300	
infinity		0.674	1.150	1.282	1.440	1.645	1.960	2.326	2.576	3.291



		Area to the Right of Critical Value										
d.f.		0.995	0.99	0.975	0.95	0.9	0.9	0.1	0.05	0.025	0.01	0.005
1	—	—	—	—	—	—	—	—	—	—	—	—
2	0.010	0.020	0.051	0.103	0.211	0.465	0.591	0.7378	0.9210	10.597		
3	0.072	0.115	0.216	0.352	0.584	0.6251	0.7815	0.9348	11.345	12.838		
4	0.207	0.297	0.484	0.711	1.064	1.779	2.948	11.143	13.277	14.860		
5	0.412	0.554	0.831	1.145	1.610	2.936	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	1.259	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	17.555	20.090	21.955		
9	1.735	2.088	2.700	3.325	4.168	14.684	19.919	21.666	23.589	25.188		
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	24.275	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	40.666	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		
35	20.707	22.164	24.433	26.509	29.051	51.805	55.758	59.342	63.691	66.766		
40	20.707	22.97.07	27.991	30.357	34.764	36.689	63.167	67.505	71.420	76.154	79.490	
50	20.707	35.534	37.485	40.482	43.188	46.459	74.397	79.082	83.298	88.379	91.952	
60	20.707	43.275	45.442	48.758	51.739	55.329	85.527	90.531	95.023	100.425	104.215	
70	20.7065	67.328	74.222	77.929	82.358	118.498	101.879	106.629	112.329	116.321	124.116	
100	20.7065	67.328	70.065	74.222	77.929	118.498	113.145	120.561	135.807	140.169		



Standard Normal Distribution Probabilities Table



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	-0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359	
-3.3	0.0005	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	-0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753	
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005	-0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141	
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0008	0.0008	-0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517	
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010	-0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879	
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014	-0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224	
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019	-0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549	
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026	-0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852	
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036	-0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133	
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048	-0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389	
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064	-1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
-2.3	0.0107	0.0104	0.0102	0.0099	0.0094	0.0091	0.0089	0.0087	0.0084	0.0084	-1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110	-1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143	-1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183	-1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9310	0.9319
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233	-1.5	0.9312	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294	-1.6	0.9432	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367	-1.7	0.9534	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
-1.6	0.0548	0.0537	0.0526	0.0516	0.0495	0.0485	0.0475	0.0465	0.0455	0.0455	-1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9706	0.9719
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559	-1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681	-2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823	-2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985	-2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170	-2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379	-2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611	-2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867	-2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148	-2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451	-2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9981	0.9981
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776	-3.0	0.9981	0.9982	0.9983	0.9984	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121	-3.1	0.9991	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483	-3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995
-0.2	0.4207	0.4168	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859	0.3821	-3.3	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996
-0.1	0.4602	0.4562	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247	0.4211	-3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998	0.9998

Confidence Interval Critical Values, $Z_{\alpha/2}$

Level of Confidence	Critical Value, $Z_{\alpha/2}$
0.90 or 90%	1.645
0.95 or 95%	1.96
0.98 or 98%	2.33
0.99 or 99%	2.575

Hypothesis Testing Critical Values

Level of Significance, α	Left-Tailed	Right-Tailed	Two-Tailed
0.10	-1.28	1.28	± 1.645
0.05	-1.645	1.645	± 1.96
0.01	-2.33	2.33	± 2.575