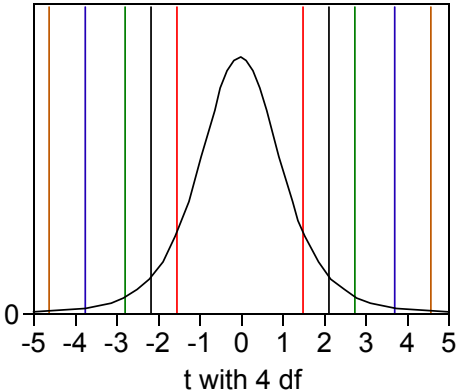
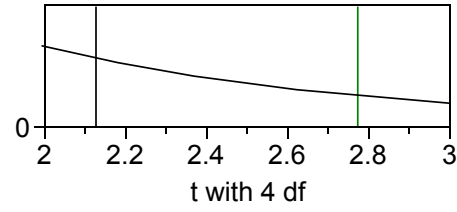


T-Table: Critical values of Student's *t* distribution

Confidence level (central area):	0.80	0.90	0.95	0.98	0.99	
P-value for two-sided alternative:	0.20	0.10	0.05	0.02	0.01	
one-sided alternative:	0.10	0.05	0.025	0.01	0.005	
Example: <i>t</i> with 4 deg of freedom	1	3.078	6.314	12.706	31.821	63.657
 <p>The vertical lines reference the <i>critical values</i> of the <i>t</i> statistic for the purpose of statistical inference.</p> <p>For <i>confidence interval estimation</i>, the critical values are the <i>multipliers</i> of <i>standard error</i> that yield the <i>margin of error</i> in the formula (MOE) = (<i>t</i>)(s.e.). For a 90% confidence interval with 4 degrees of freedom, the multiplier is <i>t</i> = ±2.132, as indicated by the black vertical lines in the graph.</p> <p>For <i>hypothesis testing</i>, the critical values are the <i>P-values</i> that correspond to the commonly used <i>significance levels</i> of $\alpha = 0.10, 0.05, \text{ and } 0.01$. For testing $H_0: \mu \leq 150$ vs. $H_A: \mu > 150$, an observation of <i>t</i> = 2.2 with 4 degrees of freedom indicates that the P-value is $0.025 < P < 0.05$, because <i>t</i> = 2.2 is between the critical values of <i>t</i> = 2.132 and <i>t</i> = 2.776.</p> 	2	1.886	2.920	4.303	6.965	9.925
	3	1.638	2.353	3.182	4.541	5.841
	4	1.533	2.132	2.776	3.747	4.604
	5	1.476	2.015	2.571	3.365	4.032
	6	1.440	1.943	2.447	3.143	3.707
	7	1.415	1.895	2.365	2.998	3.499
	8	1.397	1.860	2.306	2.896	3.355
	9	1.383	1.833	2.262	2.821	3.250
	10	1.372	1.812	2.228	2.764	3.169
	11	1.363	1.796	2.201	2.718	3.106
	12	1.356	1.782	2.179	2.681	3.055
	13	1.350	1.771	2.160	2.650	3.012
	14	1.345	1.761	2.145	2.624	2.977
	15	1.341	1.753	2.131	2.602	2.947
	16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898	
18	1.330	1.734	2.101	2.552	2.878	
19	1.328	1.729	2.093	2.539	2.861	
20	1.325	1.725	2.086	2.528	2.845	
21	1.323	1.721	2.080	2.518	2.831	
22	1.321	1.717	2.074	2.508	2.819	
23	1.319	1.714	2.069	2.500	2.807	
24	1.318	1.711	2.064	2.492	2.797	
25	1.316	1.708	2.060	2.485	2.787	
26	1.315	1.706	2.056	2.479	2.779	
27	1.314	1.703	2.052	2.473	2.771	
28	1.313	1.701	2.048	2.467	2.763	
29	1.311	1.699	2.045	2.462	2.756	
30	1.310	1.697	2.042	2.457	2.750	
40	1.303	1.684	2.021	2.423	2.704	
50	1.299	1.676	2.009	2.403	2.678	
60	1.296	1.671	2.000	2.390	2.660	
70	1.294	1.667	1.994	2.381	2.648	
80	1.292	1.664	1.990	2.374	2.639	
90	1.291	1.662	1.987	2.368	2.632	
100	1.290	1.660	1.984	2.364	2.626	
1000	1.282	1.646	1.962	2.330	2.581	
Standard Normal = Infinite	1.282	1.645	1.960	2.326	2.576	