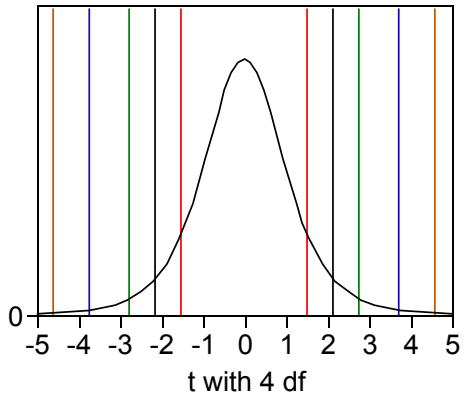
T-Table: Critical values of Student's *t* distribution

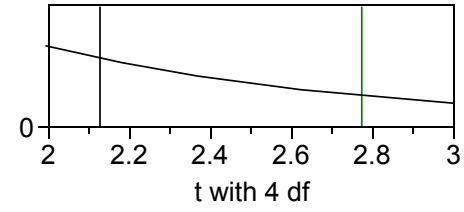
Example: *t* with 4 deg of freedom



The vertical lines reference the *critical values* of the *t* statistic for the purpose of statistical inference.

For *confidence interval estimation*, the critical values are the *multipliers* of *standard error* that yield the *margin of error* in the formula (MOE) = (*t*)(s.e.). For a 90% confidence interval with 4 degrees of freedom, the multiplier is $t = \pm 2.132$, as indicated by the black vertical lines in the graph.

For *hypothesis testing*, the critical values are the *P-values* that correspond to the commonly used *significance levels* of $\alpha = 0.10$, 0.05, and 0.01. For testing H_0: $\mu \le 150$ vs. H_A: $\mu > 150$, an observation of $t = 2.2$ with 4 degrees of freedom indicates that the P-value is $0.025 < P < 0.05$, because $t = 2.2$ is between the critical values of $t = 2.132$ and $t = 2.776$.



	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***
Degrees of Freedom	1	3.078	6.314	12.706	31.821	63.657
	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