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Formula(s) provided for your use on the test:

$$s = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}} \qquad \hat{y} = a + bx \qquad b = \frac{\sum xy - \frac{(\sum x)(\sum y)}{n}}{\sum x^2 - \frac{(\sum x)^2}{n}} \qquad a = \bar{y} - b\bar{x}$$

$$z = \frac{x - \mu}{\sigma} \qquad z = \frac{\bar{x} - \mu_{\bar{x}}}{\sigma_{\bar{x}}} = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} \qquad \mu_p = \pi \qquad \sigma_p = \sqrt{\frac{\pi(1 - \pi)}{n}} \qquad n\pi \geq 10 \text{ and } n(1 - \pi) \geq 10$$

$$p \pm (z \text{ critical value}) \sqrt{\frac{p(1 - p)}{n}} \qquad n = \pi(1 - \pi) \left( \frac{z \text{ critical value}}{B} \right)^2 \qquad \bar{x} \pm (z \text{ critical value}) \frac{\sigma}{\sqrt{n}}$$

$$\bar{x} \pm (t \text{ critical value}) \frac{s}{\sqrt{n}} \qquad n = \left( \frac{(z \text{ critical value})\sigma}{B} \right)^2 \qquad z = \frac{\bar{x} - \text{hypothesized value}}{\frac{\sigma}{\sqrt{n}}}$$

$$z = \frac{p - \text{hypothesized value}}{\sqrt{\frac{(\text{hypothesized value})(1 - \text{hypothesized value})}{n}}} \qquad t = \frac{\bar{x} - \text{hypothesized value}}{\frac{s}{\sqrt{n}}}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2 - \text{hypothesized value}}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \qquad df = \frac{(V_1 + V_2)^2}{\frac{V_1^2}{n_1 - 1} + \frac{V_2^2}{n_2 - 1}} \qquad V_1 = \frac{s_1^2}{n_1} \qquad V_2 = \frac{s_2^2}{n_2}$$

$$\bar{x}_1 - \bar{x}_2 \pm (t \text{ critical value}) \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

$$t = \frac{\bar{x}_d - \text{hypothesized value}}{\frac{s_d}{\sqrt{n}}} \qquad \bar{x}_d \pm (t \text{ critical value}) \frac{s_d}{\sqrt{n}}$$

$$p_c = \frac{n_1 p_1 + n_2 p_2}{n_1 + n_2} = \frac{\text{total number of S's in the two samples}}{\text{total of the two sample sizes}} \qquad z = \frac{p_1 - p_2}{\sqrt{\frac{p_c(1 - p_c)}{n_1} + \frac{p_c(1 - p_c)}{n_2}}}$$

$$n_1 p_1 \geq 10, n_1(1 - p_1) \geq 10, n_2 p_2 \geq 10, n_2(1 - p_2) \geq 10$$

$$(p_1 - p_2) \pm (z \text{ critical value}) \sqrt{\frac{p_1(1 - p_1)}{n_1} + \frac{p_2(1 - p_2)}{n_2}} \qquad \chi^2 = \sum_{\text{all cells}} \frac{(\text{observed cell count} - \text{expected cell count})^2}{\text{expected cell count}}$$


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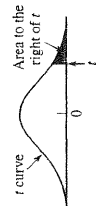
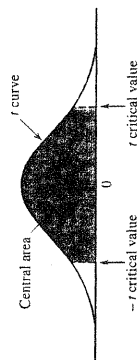


Table 3 *t* Critical Values

Degrees of freedom	Confidence level:										
	.80	.90	.95	.98	.99	.998	.999	95.9%			99.9%
1	3.08	6.31	12.71	31.82	63.66	318.31	636.62				
2	1.89	2.92	4.30	6.97	9.95	23.33	31.60				
3	1.64	2.35	3.18	4.54	5.84	10.21	12.92				
4	1.53	2.13	2.78	4.25	4.60	7.17	8.61				
5	1.48	2.02	2.57	3.37	4.03	5.89	6.86				
6	1.44	1.94	2.45	3.14	3.71	5.21	5.96				
7	1.42	1.90	2.37	3.00	3.50	4.79	5.41				
8	1.40	1.86	2.31	2.90	3.36	4.50	5.04				
9	1.38	1.83	2.26	2.82	3.25	4.30	4.78				
10	1.37	1.81	2.23	2.76	3.17	4.14	4.59				
11	1.36	1.80	2.20	2.72	3.11	4.03	4.44				
12	1.36	1.78	2.18	2.68	3.06	3.93	4.32				
13	1.35	1.77	2.16	2.65	3.01	3.85	4.22				
14	1.35	1.76	2.15	2.62	2.98	3.79	4.14				
15	1.34	1.75	2.13	2.60	2.95	3.73	4.07				
16	1.34	1.75	2.12	2.58	2.92	3.69	4.02				
17	1.33	1.74	2.11	2.57	2.90	3.65	3.97				
18	1.33	1.73	2.10	2.55	2.88	3.61	3.92				
19	1.33	1.73	2.09	2.54	2.86	3.58	3.88				
20	1.33	1.73	2.09	2.53	2.85	3.55	3.85				
21	1.32	1.72	2.08	2.52	2.83	3.53	3.82				
22	1.32	1.72	2.07	2.51	2.82	3.51	3.79				
23	1.32	1.71	2.07	2.50	2.81	3.49	3.77				
24	1.32	1.71	2.06	2.49	2.80	3.47	3.75				
25	1.32	1.71	2.06	2.49	2.79	3.45	3.73				
26	1.32	1.71	2.06	2.48	2.78	3.44	3.71				
27	1.31	1.70	2.05	2.47	2.77	3.42	3.69				
28	1.31	1.70	2.05	2.47	2.76	3.41	3.67				
29	1.31	1.70	2.05	2.46	2.76	3.40	3.66				
30	1.31	1.70	2.04	2.46	2.75	3.39	3.65				
40	1.30	1.68	2.02	2.42	2.70	3.31	3.55				
60	1.30	1.67	2.00	2.39	2.66	3.23	3.46				
120	1.29	1.66	1.98	2.36	2.62	3.16	3.37				
<b>z critical values</b>	∞	1.28	1.645	1.96	2.58	3.09	3.29				

Table 4 Tail Areas for *t* Curves

df	<i>t</i>												
	0.0	1	2	3	4	5	6	7	8	9	10	11	12
500	500	500	500	500	500	500	500	500	500	500	500	500	500
0.1	.468	.465	.463	.463	.463	.462	.462	.462	.461	.461	.461	.461	.461
0.2	.437	.430	.427	.427	.426	.424	.424	.423	.423	.423	.423	.423	.423
0.3	.407	.396	.392	.390	.388	.387	.386	.386	.386	.386	.385	.385	.385
0.4	.379	.364	.358	.355	.353	.352	.351	.350	.349	.349	.348	.348	.348
0.5	.352	.333	.326	.322	.319	.317	.316	.315	.315	.315	.314	.313	.313
0.6	.328	.305	.295	.290	.287	.285	.284	.283	.282	.281	.280	.280	.280
0.7	.306	.278	.267	.261	.258	.255	.253	.252	.251	.250	.249	.249	.249
0.8	.285	.254	.241	.234	.230	.227	.225	.223	.222	.221	.220	.220	.220
0.9	.267	.232	.217	.210	.205	.201	.199	.197	.196	.195	.194	.193	.193
1.0	.250	.211	.196	.187	.182	.178	.175	.173	.172	.171	.170	.169	.169
1.1	.235	.193	.176	.167	.162	.157	.154	.152	.150	.149	.147	.146	.146
1.2	.221	.177	.158	.148	.142	.138	.135	.132	.130	.129	.128	.127	.127
1.3	.209	.162	.142	.132	.125	.121	.117	.115	.113	.111	.110	.109	.109
1.4	.197	.148	.128	.117	.110	.106	.102	.100	.098	.096	.095	.093	.093
1.5	.187	.136	.115	.104	.097	.092	.088	.086	.084	.082	.081	.080	.080
1.6	.178	.125	.104	.092	.085	.080	.077	.074	.072	.070	.069	.068	.068
1.7	.169	.116	.094	.082	.075	.070	.066	.064	.062	.060	.059	.057	.057
1.8	.161	.107	.085	.073	.066	.061	.057	.055	.053	.051	.050	.049	.049
1.9	.154	.099	.077	.065	.058	.053	.050	.047	.045	.043	.042	.041	.041
2.0	.148	.092	.070	.058	.051	.046	.043	.040	.038	.037	.035	.034	.034
2.1	.141	.085	.063	.052	.045	.040	.037	.034	.033	.031	.030	.029	.029
2.2	.136	.079	.058	.046	.040	.035	.032	.029	.028	.026	.025	.024	.024
2.3	.131	.074	.052	.041	.035	.031	.027	.024	.023	.021	.020	.019	.018
2.4	.126	.069	.048	.037	.031	.027	.024	.022	.020	.019	.018	.017	.017
2.5	.121	.065	.044	.033	.027	.023	.020	.018	.017	.016	.015	.014	.014
2.6	.117	.061	.040	.030	.024	.020	.018	.016	.016	.014	.013	.012	.012
2.7	.113	.057	.037	.027	.021	.018	.015	.014	.012	.012	.011	.010	.010
2.8	.109	.054	.034	.024	.019	.016	.013	.012	.010	.010	.009	.009	.008
2.9	.106	.051	.031	.021	.017	.014	.011	.010	.009	.008	.007	.007	.007
3.0	.102	.048	.029	.020	.015	.012	.010	.009	.007	.007	.006	.006	.006
3.1	.099	.045	.027	.018	.013	.011	.009	.008	.006	.006	.005	.005	.005
3.2	.096	.043	.025	.016	.012	.010	.008	.007	.005	.005	.004	.004	.004
3.3	.094	.040	.023	.015	.011	.009	.007	.006	.004	.004	.003	.003	.003
3.4	.091	.038	.021	.014	.010	.007	.006	.005	.004	.003	.003	.002	.002
3.5	.089	.036	.020	.012	.009	.006	.005	.004	.003	.002	.002	.002	.002
3.6	.086	.033	.018	.011	.008	.006	.004	.004	.003	.002	.002	.002	.002
3.7	.084	.033	.017	.010	.007	.005	.004	.003	.003	.002	.002	.001	.001
3.8	.082	.031	.016	.010	.006	.004	.003	.003	.002	.002	.001	.001	.001
3.9	.080	.030	.015	.009	.006	.004	.003	.002	.002	.002	.001	.001	.001
4.0	.078	.029	.014	.008	.005	.004	.003	.002	.002	.002	.001	.001	.001

(Continued)

Table 8 Upper-Tail Areas for Chi-Square Distributions

Right-tail area	df = 1	df = 2	df = 3	df = 4	df = 5
>0.100	< 2.70	< 4.60	< 6.25	< 7.77	< 9.23
0.100	2.70	4.60	6.25	7.77	9.23
0.095	2.78	4.70	6.36	7.90	9.37
0.090	2.87	4.81	6.49	8.04	9.52
0.085	2.96	4.93	6.62	8.18	9.67
0.080	3.06	5.05	6.75	8.33	9.83
0.075	3.17	5.18	6.90	8.49	10.00
0.070	3.28	5.31	7.06	8.66	10.19
0.065	3.40	5.46	7.22	8.84	10.38
0.060	3.53	5.62	7.40	9.04	10.59
0.055	3.68	5.80	7.60	9.25	10.82
0.050	3.84	5.99	7.81	9.48	11.07
0.045	4.01	6.20	8.04	9.74	11.34
0.040	4.21	6.43	8.31	10.02	11.64
0.035	4.44	6.70	8.60	10.34	11.98
0.030	4.70	7.01	8.94	10.71	12.37
0.025	5.02	7.37	9.34	11.14	12.83
0.020	5.41	7.82	9.83	11.66	13.38
0.015	5.91	8.39	10.46	12.33	14.09
0.010	6.63	9.21	11.34	13.27	15.08
0.005	7.87	10.59	12.83	14.86	16.74
0.001	10.82	13.81	16.26	18.46	20.51
<0.001	>10.82	>13.81	>16.26	>18.46	>20.51

Right-tail area	df = 6	df = 7	df = 8	df = 9	df = 10
>0.100	<10.64	<12.01	<13.36	<14.68	<15.98
0.100	10.64	12.01	13.36	14.68	15.98
0.095	10.79	12.17	13.52	14.85	16.16
0.090	10.94	12.33	13.69	15.03	16.35
0.085	11.11	12.50	13.87	15.22	16.54
0.080	11.28	12.69	14.06	15.42	16.75
0.075	11.46	12.88	14.26	15.63	16.97
0.070	11.65	13.08	14.48	15.85	17.20
0.065	11.86	13.30	14.71	16.09	17.44
0.060	12.08	13.53	14.95	16.34	17.71
0.055	12.33	13.79	15.22	16.62	17.99
0.050	12.59	14.06	15.50	16.91	18.30
0.045	12.87	14.36	15.82	17.24	18.64
0.040	13.19	14.70	16.17	17.60	19.02
0.035	13.55	15.07	16.56	18.01	19.44
0.030	13.96	15.50	17.01	18.47	19.92
0.025	14.44	16.01	17.53	19.02	20.48
0.020	15.03	16.62	18.16	19.67	21.16
0.015	15.77	17.39	18.97	20.51	22.02
0.010	16.81	18.47	20.09	21.66	23.20
0.005	18.54	20.27	21.95	23.58	25.18
0.001	22.45	24.32	26.12	27.87	29.58
<0.001	>22.45	>24.32	>26.12	>27.87	>29.58

Table 8 Upper-Tail Areas for Chi-Square Distributions (Continued)

Right-tail area	df = 11	df = 12	df = 13	df = 14	df = 15
>0.100	<17.27	<18.54	<19.81	<21.06	<22.30
0.100	17.27	18.54	19.81	21.06	22.30
0.095	17.45	18.74	20.00	21.26	22.51
0.090	17.65	18.93	20.21	21.47	22.73
0.085	17.85	19.14	20.42	21.69	22.95
0.080	18.06	19.36	20.65	21.93	23.19
0.075	18.29	19.60	20.89	22.17	23.45
0.070	18.53	19.84	21.15	22.44	23.72
0.065	18.78	20.11	21.42	22.71	24.00
0.060	19.06	20.39	21.71	23.01	24.31
0.055	19.35	20.69	22.02	23.33	24.63
0.050	19.67	21.02	22.36	23.68	24.99
0.045	20.02	21.38	22.73	24.06	25.38
0.040	20.41	21.78	23.14	24.48	25.81
0.035	20.84	22.23	23.60	24.95	26.29
0.030	21.34	22.74	24.12	25.49	26.84
0.025	21.92	23.33	24.73	26.11	27.48
0.020	22.61	24.05	25.47	26.87	28.25
0.015	23.38	24.96	26.40	27.82	29.23
0.010	24.72	26.21	27.68	29.14	30.57
0.005	26.75	28.29	29.81	31.31	32.80
0.001	31.26	32.90	34.52	36.12	37.69
<0.001	>31.26	>32.90	>34.52	>36.12	>37.69

Right-tail area	df = 16	df = 17	df = 18	df = 19	df = 20
>0.100	<23.54	<24.77	<25.98	<27.20	<28.41
0.100	23.54	24.76	25.98	27.20	28.41
0.095	23.75	24.98	26.21	27.43	28.64
0.090	23.97	25.21	26.44	27.66	28.88
0.085	24.21	25.45	26.68	27.91	29.14
0.080	24.45	25.70	26.94	28.18	29.40
0.075	24.71	25.97	27.21	28.45	29.69
0.070	24.99	26.25	27.50	28.75	29.99
0.065	25.28	26.55	27.81	29.06	30.30
0.060	25.59	26.87	28.13	29.39	30.64
0.055	25.93	27.21	28.48	29.75	31.01
0.050	26.29	27.58	28.86	30.14	31.41
0.045	26.69	27.99	29.28	30.56	31.84
0.040	27.13	28.44	29.74	31.03	32.32
0.035	27.62	28.94	30.25	31.56	32.85
0.030	28.19	29.52	30.84	32.15	33.46
0.025	28.84	30.19	31.52	32.85	34.16
0.020	29.63	30.99	32.34	33.68	35.01
0.015	30.62	32.01	33.38	34.74	36.09
0.010	32.00	33.40	34.80	36.19	37.56
0.005	34.26	35.71	37.15	38.58	39.99
0.001	39.25	40.78	42.31	43.81	45.31
<0.001	>39.25	>40.78	>42.31	>43.81	>45.31