

Table VIII Critical Values of X for the Sign Test

n	One tail $\alpha = .005$ Two tail $\alpha = .01$		One tail $\alpha = .01$ Two tail $\alpha = .02$		One tail $\alpha = .025$ Two tail $\alpha = .05$		One tail $\alpha = .05$ Two tail $\alpha = .10$	
	Lower critical value	Upper critical value	Lower critical value	Upper critical value	Lower critical value	Upper critical value	Lower critical value	Upper critical value
1	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	—
3	—	—	—	—	—	—	—	—
4	—	—	—	—	—	—	—	—
5	—	—	—	—	—	—	0	5
6	—	—	—	—	0	6	0	6
7	—	—	0	7	0	7	0	7
8	0	8	0	8	0	8	1	7
9	0	9	0	9	1	8	1	8
10	0	10	0	10	1	9	1	9
11	0	11	1	10	1	10	2	9
12	1	11	1	11	2	10	2	10
13	1	12	1	12	2	11	3	10
14	1	13	2	12	2	12	3	11
15	2	13	2	13	3	12	3	12
16	2	14	2	14	3	13	4	12
17	2	15	3	14	4	13	4	13
18	3	15	3	15	4	14	5	13
19	3	16	4	15	4	15	5	14
20	3	17	4	16	5	15	5	15
21	4	17	4	17	5	16	6	15
22	4	18	5	17	5	17	6	16
23	4	19	5	18	6	17	7	16
24	5	19	5	19	6	18	7	17
25	5	20	6	19	7	18	7	18

Source: D. B. Owen, *Handbook of Statistical Tables*. © 1962 by Addison-Wesley Publishing Company, Inc. Reprinted by permission of Addison Wesley Longman.

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

n	One-tailed $\alpha = .005$ Two-tailed $\alpha = .01$	One-tailed $\alpha = .01$ Two-tailed $\alpha = .02$	One-tailed $\alpha = .025$ Two-tailed $\alpha = .05$	One-tailed $\alpha = .05$ Two-tailed $\alpha = .10$
1	—	—	—	—
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—
5	—	—	—	1
6	—	—	1	2
7	—	0	2	4
8	0	2	4	6
9	2	3	6	8
10	3	5	8	11
11	5	7	11	14
12	7	10	14	17
13	10	13	17	21
14	13	16	21	26
15	16	20	25	30

Source: *Some Rapid Approximate Statistical Procedures*, 1964. Reprinted with permission of Lederle Pharmaceutical Division of American Cyanamid Company, Philadelphia, PA.

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

a. One-tailed $\alpha = .025$; Two-tailed $\alpha = .05$

$n_1 \backslash n_2$	3		4		5		6		7		8		9		10	
	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U
3	5	16	6	18	6	21	7	23	7	26	8	28	8	31	9	33
4	6	18	11	25	12	28	12	32	13	35	14	38	15	41	16	44
5	6	21	12	28	18	37	19	41	20	45	21	49	22	53	24	56
6	7	23	12	32	19	41	26	52	28	56	29	61	31	65	32	70
7	7	26	13	35	20	45	28	56	37	68	39	73	41	78	43	83
8	8	28	14	38	21	49	29	61	39	73	49	87	51	93	54	98
9	8	31	15	41	22	53	31	65	41	78	51	93	63	108	66	114
10	9	33	16	44	24	56	32	70	43	83	54	98	66	114	79	131

b. One-tailed $\alpha = .05$; Two-tailed $\alpha = .10$

$n_1 \backslash n_2$	3		4		5		6		7		8		9		10	
	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U	T_L	T_U
3	6	15	7	17	7	20	8	22	9	24	9	27	10	29	11	31
4	7	17	12	24	13	27	14	30	15	33	16	36	17	39	18	42
5	7	20	13	27	19	36	20	40	22	43	24	46	25	50	26	54
6	8	22	14	30	20	40	28	50	30	54	32	58	33	63	35	67
7	9	24	15	33	22	43	30	54	39	66	41	71	43	76	46	80
8	9	27	16	36	24	46	32	58	41	71	52	84	54	90	57	95
9	10	29	17	39	25	50	33	63	43	76	54	90	66	105	69	111
10	11	31	18	42	26	54	35	67	46	80	57	95	69	111	83	127

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

<i>n</i>	One-tailed α			
	.05	.025	.01	.005
	Two-tailed α			
	.10	.05	.02	.01
5	±.900	—	—	—
6	±.829	±.886	±.943	—
7	±.714	±.786	±.893	±.929
8	±.643	±.738	±.833	±.881
9	±.600	±.700	±.783	±.833
10	±.564	±.648	±.745	±.794
11	±.536	±.618	±.709	±.755
12	±.503	±.587	±.678	±.727
13	±.475	±.566	±.672	±.744
14	±.456	±.544	±.645	±.714
15	±.440	±.524	±.622	±.688
16	±.425	±.506	±.601	±.665
17	±.411	±.490	±.582	±.644
18	±.399	±.475	±.564	±.625
19	±.388	±.462	±.548	±.607
20	±.377	±.450	±.534	±.591
21	±.368	±.438	±.520	±.576
22	±.359	±.428	±.508	±.562
23	±.351	±.418	±.496	±.549
24	±.343	±.409	±.485	±.537
25	±.336	±.400	±.475	±.526
26	±.329	±.392	±.465	±.515
27	±.323	±.384	±.456	±.505
28	±.317	±.377	±.448	±.496
29	±.311	±.370	±.440	±.487
30	±.305	±.364	±.432	±.478

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

$n_1 \backslash n_2$	5	6	7	8	9	10	11	12	13	14	15
2	—	—	—	—	—	—	—	2 6	2 6	2 6	2 6
3	—	2 8	2 8	2 8	2 8	2 8	2 8	2 8	2 8	2 8	3 8
4	2 9	2 9	2 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10	3 10
5	2 10	3 10	3 11	3 11	3 12	3 12	4 12	4 12	4 12	4 12	4 12
6	3 10	3 11	3 12	3 12	4 13	4 13	4 13	4 13	5 14	5 14	5 14
7	3 11	3 12	3 13	4 13	4 14	5 14	5 14	5 14	5 15	5 15	6 15
8	3 11	3 12	4 13	4 14	5 14	5 15	5 15	6 16	6 16	6 16	6 16
9	3 12	4 13	4 14	5 14	5 15	5 16	6 16	6 16	6 17	7 17	7 18
10	3 12	4 13	5 14	5 15	5 16	6 16	6 17	7 17	7 18	7 18	7 18
11	4 12	4 13	5 14	5 15	6 16	6 17	7 17	7 18	7 19	8 19	8 19
12	4 12	4 13	5 14	6 16	6 16	7 17	7 18	7 19	8 19	8 20	8 20
13	4 12	5 14	5 15	6 16	6 17	7 18	7 19	8 19	8 20	9 20	9 21
14	4 12	5 14	5 15	6 16	7 17	7 18	8 19	8 20	9 20	9 21	9 22
15	4 12	5 14	6 15	6 16	7 18	7 18	8 19	8 20	9 21	9 22	10 22

Source: Frieda S. Swed and C. Eisenhart, "Tables for Testing Randomness of Grouping in a Sequence of Alternatives," *The Annals of Statistics* 14(1943). Reprinted with permission of the Institute of Mathematical Statistics.