Table VIII Critical Values of *X* for the Sign Test

	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 $\alpha = .10$	
n	**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_2 \ n_1	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_2 \ n_1	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

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

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

	One-tailed α			
	.05	.025	.01	.005
	Two-tailed α			
n	.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 \ n_2	5	6	7	8	9	10	11	12	13	14	15
2	—	—	—	—	—	—	—	2	2	2	2
								6	6	6	6
3	—	2	2	2	2	2	2	2	2	2	3
		8	8	8	8	8	8	8	8	8	8
4	2	2	2	3	3	3	3	3	3	3	3
	9	9	10	10	10	10	10	10	10	10	10
5	2	3	3	3	3	3	4	4	4	4	4
	10	10	11	11	12	12	12	12	12	12	12
6	3	3	3	3	4	4	4	4	5	5	5
	10	11	12	12	13	13	13	13	14	14	14
7	3	3	3	4	4	5	5	5	5	5	6
	11	12	13	13	14	14	14	14	15	15	15
8	3	3	4	4	5	5	5	6	6	6	6
	11	12	13	14	14	15	15	16	16	16	16
9	3	4	4	5	5	5	6	6	6	7	7
	12	13	14	14	15	16	16	16	17	17	18
10	3	4	5	5	5	6	6	7	7	7	7
	12	13	14	15	16	16	17	17	18	18	18
11	4	4	5	5	6	6	7	7	7	8	8
	12	13	14	15	16	17	17	18	19	19	19
12	4	4	5	6	6	7	7	7	8	8	8
	12	13	14	16	16	17	18	19	19	20	20
13	4	5	5	6	6	7	7	8	8	9	9
	12	14	15	16	17	18	19	19	20	20	21
14	4	5	5	6	7	7	8	8	9	9	9
	12	14	15	16	17	18	19	20	20	21	22
15	4	5	6	6	7	7	8	8	9	9	10
	12	14	15	16	18	18	19	20	21	22	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.