TABLES FOR TRANSFORMING CHROMATICITY COORDINATES FROM THE I.C.I. SYSTEM TO THE R-U-C-S SYSTEM

DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

Photometry and Colorimetry Section
Washington, D.C.

Letter Circular LC897
May 1948

Basis of Tables

These tables are based on the I.C.I. standard observer and coordinate system with equal energy as basic stimulus. This system is described in detail by D. B. Judd, Jour. Opt. Soc. Amer. 23, 359, 1933, and by A. C. Hardy, Handbook of Colorimetry, Technology Press, Cambridge, Mass., 1936.

The R-U-C-S system is based on a proposal by D. B. Judd, "A Maxwell Triangle Yielding Uniform Chromaticity Scales", N.B.S. Research Paper RP756 and Jour. Opt. Soc. Amer. 25, 24, 1935, as modified by F. C. Breckenridge and W. R. Schaub, "Rectangular Uniform-Chromaticity-Scale Coordinates", Jour. Opt. Soc. Amer. 29, 370, 1939, Proceedings of the International Commission on Illumination, Tenth Session, 2, 81, 1942.

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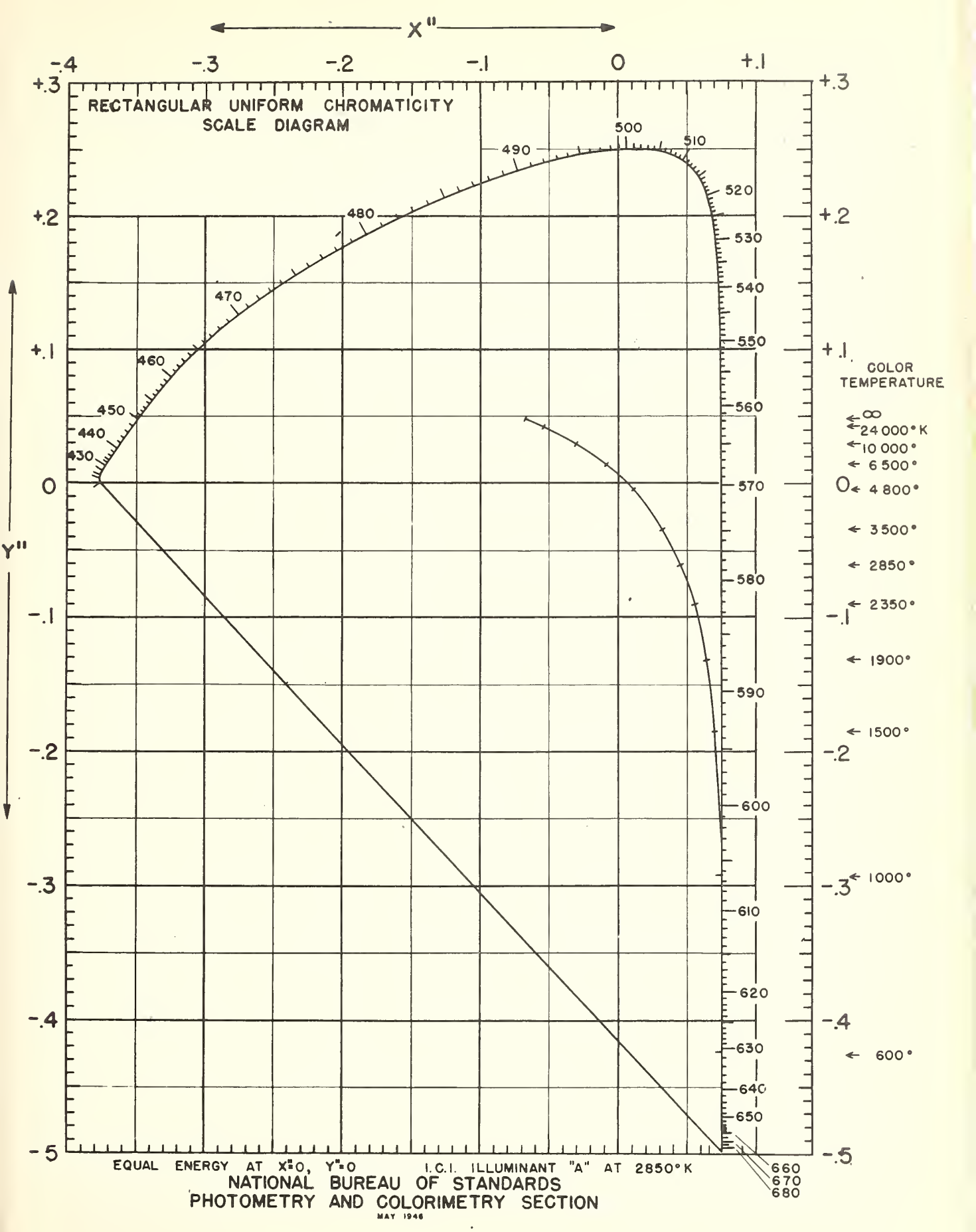
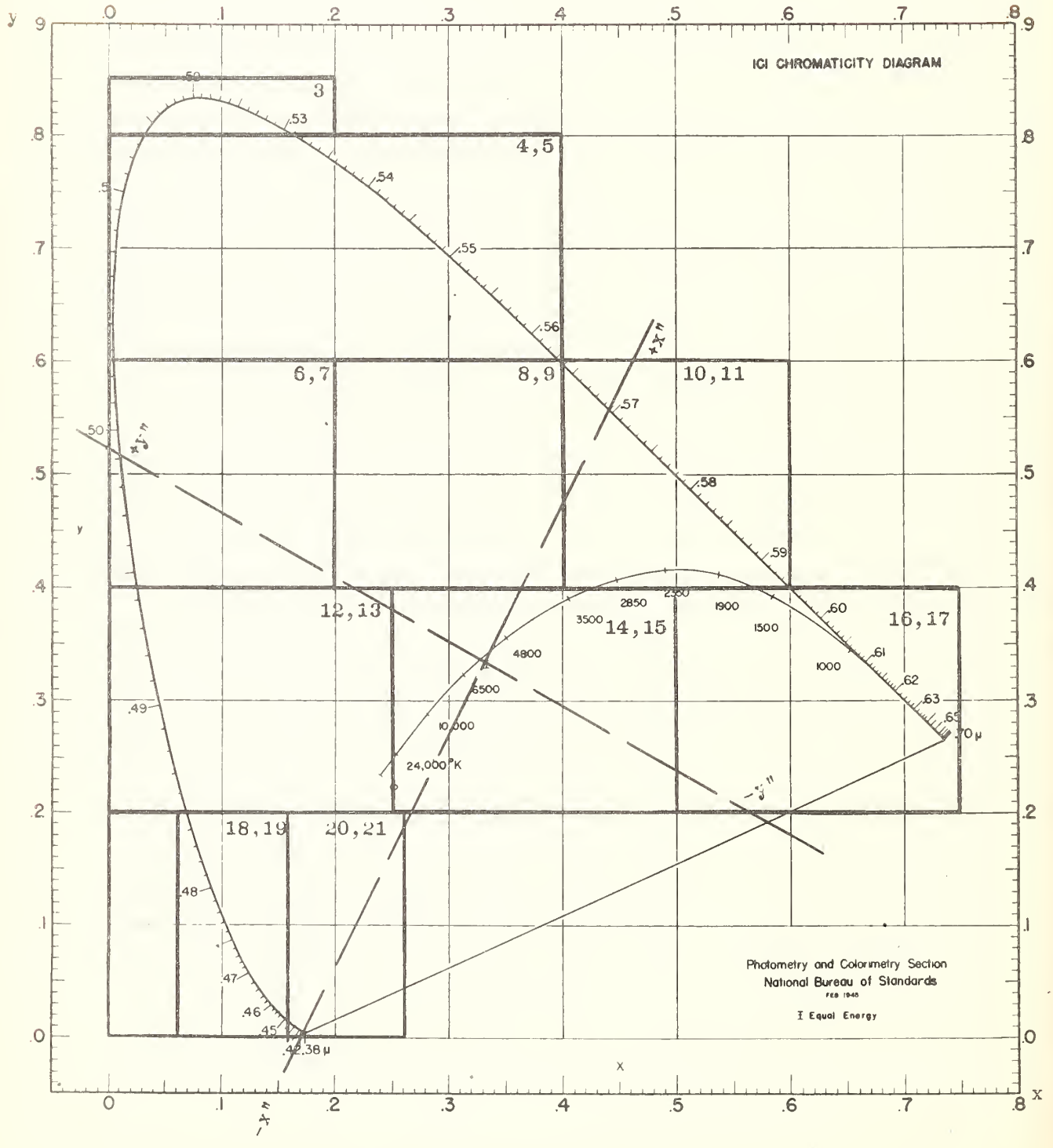
Accuracy

The following is a summary of the maximum errors to be expected in three sections of the main table for interpolations made as shown in the example on page 3. These are extreme cases. The errors are much smaller thruout most of the table. The errors due to Δx can be made negligible by computing an accurate difference instead of using the approximate values given in the table.

Source of error	Error x 10^5 y=0,x=.20		y=.20,x=.75		y=.60,x=.40	
	x"	y"	x"	y"	x"	y"
Non-linearity relative to y	+32	+16	-03	+20	-01	-01
Non-linearity relative to x	-02	+17	+11	+44	+07	-26
Rejection error for function	±05	±05	±05	±05	±05	±05
Rejection error for Δy	±00.5	±00.5	±00.5	±00.5	±00.5	±00.5
Rejection error for Δx	±10	±10	±25	±25	±50	±50
Cut-back error	±05	±05	±05	±05	±05	±05
Total (Maximum)	+52	+53	+46	+99	+67	-87


X"
-.4
-.3
-.2
-.1
0
+.1
+.3
+.2
+.1
0
-.1
-.2
-.3
-.4
-.5
Y"
RECTANGULAR UNIFORM CHROMATICITY SCALE DIAGRAM
500
510
490
520
480
530
470
540
460
550
450
560
440
570
430
580
590
600
610
620
630
640
650
660
670
680
COLOR TEMPERATURE
∞
24 000° K
10 000°
6 500°
4 800°
3500°
2850°
2350°
1900°
1500°
1000°
600°
EQUAL ENERGY AT X=0, Y=0
I.C.I. ILLUMINANT "A" AT 2850° K
NATIONAL BUREAU OF STANDARDS
PHOTOMETRY AND COLORIMETRY SECTION
MAY 1946

INDEX DIAGRAM SHOWING PAGE NUMBERS IN TABLE FOR THE INDICATED PORTIONS OF THE I.C.I. MIXTURE DIAGRAM



TABLES FOR TRANSFORMING I.C.I. INTO R-U-C-S. COORDINATES

The tables for x" and y" are independent and the values of both depend on both x and y. The two tables are interleaved and arranged so that the values of the functions correspond spatially to the points in the I.C.I. diagram. All differences are for increments of .01 in the argument.

The coordinates to be transformed represent a point which lies within a rectangle defined by the four values given in the table which stand at its corners. Any mathematically sound method of interpolation may be used, but if the numerically smallest value is selected as the initial approximation, all the differences will be added and may be applied in one operation. An example follows:

Given, x=0.0913, y=0.1327 (spectrum locus value for λ=480.0 mμ).

	x"		y"
for x=.10, y=.14,	-.1725	for x=.10, y=.13	+.1753
" Δy=.007	728	" Δy=.002	24
" Δy=.0003	31	" Δy=.0007	8
" Δx=.008	184	" Δx=.008	968
" Δx=.0007	16	" Δx=.0007	85
	-.18209		+.18615
That is	x" = -.1821		y" = +.1862

By transformation equations, x" = -.1820, y" = .1862 .

For use of the "Tables for the Transformation of Linear Equations" see page 24.

	Values of x"					Values of y"				
x / y	.00		.10		.20	.00		.10		.20
.85	+.0588	11	+.0695	11	+.0805	+.2445	39	+.2053	40	+.1651
	12		11		10	2		1		6
.84	+.0576	11	+.0684	11	+.0795	+.2447	40	+.2052	41	+.1645
	13		12		11	2		2		5
.83	+.0563	11	+.0672	11	+.0784	+.2449	40	+.2050	41	+.1640
	13		12		11	3		1		5
.82	+.0550	11	+.0660	11	+.0773	+.2452	40	+.2049	41	+.1635
	13		12		11	2		2		6
.81	+.0537	11	+.0648	11	+.0762	+.2454	41	+.2047	42	+.1629
	13		13		12	3		1		6
.80	+.0524	11	+.0635	12	+.0750	+.2457	41	+.2046	42	+.1623

Values of x"

x / y	.00		.10		.20		.30		.40
.80	+.0524	11	+.0635	12	+.0750	12	+.0868		
	14		12		12		11		
.79	+.0510	11	+.0623	12	+.0738	12	+.0857		
	14		13		12		11		
.78	+.0496	11	+.0610	12	+.0726	12	+.0846		
	14		14		12		11		
.77	+.0482	11	+.0596	12	+.0714	12	+.0835		
	14		13		12		11		
.76	+.0468	12	+.0583	12	+.0702	12	+.0824		
	15		14		13		12		
.75	+.0453	12	+.0569	12	+.0689	12	+.0812		
	15		14		13		12		
.74	+.0438	12	+.0555	12	+.0676	12	+.0800		
	15		14		13		12		
.73	+.0423	12	+.0541	12	+.0663	12	+.0788		
	16		15		14		12		
.72	+.0407	12	+.0526	12	+.0649	13	+.0776		
	16		15		14		13		
.71	+.0391	12	+.0511	12	+.0635	13	+.0763		
	16		15		14		13		
.70	+.0375	12	+.0496	12	+.0621	13	+.0750	13	+.0883
	17		16		15		13		12
.69	+.0358	12	+.0480	13	+.0606	13	+.0737	13	+.0871
	17		16		14		14		12
.68	+.0341	12	+.0464	13	+.0592	13	+.0723	14	+.0859
	18		16		16		14		12
.67	+.0323	12	+.0448	13	+.0576	13	+.0709	14	+.0847
	17		17		15		14		13
.66	+.0306	12	+.0431	13	+.0561	13	+.0695	14	+.0834
	19		17		16		15		13
.65	+.0287	13	+.0414	13	+.0545	14	+.0680	14	+.0821
	18		17		16		14		14
.64	+.0269	13	+.0397	13	+.0529	14	+.0666	14	+.0807
	19		18		17		16		14
.63	+.0250	13	+.0379	13	+.0512	14	+.0650	14	+.0793
	20		19		17		15		14
.62	+.0230	13	+.0360	14	+.0495	14	+.0635	14	+.0779
	20		18		17		16		14
.61	+.0210	13	+.0342	14	+.0478	14	+.0619	15	+.0765
	21		20		18		17		15
.60	+.0189	13	+.0322	14	+.0460	14	+.0602	15	+.0750

Values of y"

x / y	.00		.10		.20		.30		.40	
.80	+.2457	41	+.2046	42	+.1623	43	+.1189			
	2		2		5		11			
.79	+.2459	42	+.2044	43	+.1618	44	+.1178			
	3		1		6		10			
.78	+.2462	42	+.2043	43	+.1612	44	+.1168			
	2		2		6		11			
.77	+.2464	42	+.2041	44	+.1606	45	+.1157			
	3		1		6		11			
.76	+.2467	43	+.2040	44	+.1600	45	+.1146			
	3		2		7		11			
.75	+.2470	43	+.2038	44	+.1593	46	+.1135			
	3		2		6		11			
.74	+.2473	44	+.2036	45	+.1587	46	+.1124			
	3		1		7		12			
.73	+.2476	44	+.2035	46	+.1580	47	+.1112			
	2		2		6		12			
.72	+.2478	44	+.2033	46	+.1574	47	+.1100			
	3		2		7		12			
.71	+.2481	45	+.2031	46	+.1567	48	+.1088			
	3		2		7		13			
.70	+.2484	46	+.2029	47	+.1560	48	+.1075	50	+.0575	
	4		2		7		12		13	
.69	+.2488	46	+.2027	47	+.1553	49	+.1063	51	+.0556	
	3		1		8		13		19	
.68	+.2491	46	+.2026	48	+.1545	50	+.1050	51	+.0537	
	3		2		7		14		19	
.67	+.2494	47	+.2024	49	+.1538	50	+.1036	52	+.0518	
	3		2		8		14		20	
.66	+.2497	48	+.2022	49	+.1530	51	+.1022	52	+.0498	
	4		2		8		14		21	
.65	+.2501	48	+.2020	50	+.1522	51	+.1008	53	+.0477	
	3		3		8		14		21	
.64	+.2504	49	+.2017	50	+.1514	52	+.0994	54	+.0456	
	4		2		8		14		12	
.63	+.2508	49	+.2015	51	+.1506	53	+.0980	55	+.0434	
	3		2		8		16		22	
.62	+.2511	50	+.2013	52	+.1498	53	+.0964	55	+.0412	
	4		2		9		15		23	
.61	+.2515	50	+.2011	52	+.1489	54	+.0949	56	+.0389	
	4		2		9		16		23	
.60	+.2519	51	+.2009	53	+.1480	55	+.0933	57	+.0366	

Values of x"

x / y	.00		.05		.10		.15		.20
.60	+.0189	13	+.0255	13	+.0322	14	+.0390	14	+.0460
	21		20		20		19		18
.59	+.0168	13	+.0235	13	+.0302	14	+.0371	14	+.0442
	21		21		20		19		19
.58	+.0147	13	+.0214	14	+.0282	14	+.0352	14	+.0423
	22		21		20		20		20
.57	+.0125	14	+.0193	14	+.0262	14	+.0332	14	+.0403
	23		22		22		21		19
.56	+.0102	14	+.0171	14	+.0240	14	+.0311	15	+.0384
	23		23		22		21		21
.55	+.0079	14	+.0148	14	+.0218	14	+.0290	15	+.0363
	24		23		22		22		21
.54	+.0055	14	+.0125	14	+.0196	14	+.0268	15	+.0342
	24		24		23		22		21
.53	+.0031	14	+.0101	14	+.0173	15	+.0246	15	+.0321
	25		24		23		23		22
.52	+.0006	14	+.0077	15	+.0150	15	+.0223	15	+.0299
	26		25		25		23		23
.51	-.0020	14	+.0052	15	+.0125	15	+.0200	15	+.0276
	26		26		25		24		23
.50	-.0046	14	+.0026	15	+.0100	15	+.0176	15	+.0253
	28		26		25		25		24
.49	-.0074	15	+.0000	15	+.0075	15	+.0151	16	+.0229
	28		27		27		26		25
.48	-.0102	15	-.0027	15	+.0048	15	+.0126	16	+.0204
	28		28		27		26		25
.47	-.0130	15	-.0055	15	+.0021	16	+.0099	16	+.0179
	30		29		28		27		26
.46	-.0160	15	-.0084	15	-.0007	16	+.0072	16	+.0153
	30		30		29		28		27
.45	-.0190	15	-.0114	16	-.0036	16	+.0044	16	+.0126
	32		30		29		29		28
.44	-.0222	16	-.0144	16	-.0065	16	+.0015	17	+.0098
	32		32		31		29		29
.43	-.0254	16	-.0176	16	-.0096	16	-.0014	17	+.0069
	33		32		31		31		29
.42	-.0287	16	-.0208	16	-.0127	16	-.0045	17	+.0040
	34		34		33		31		31
.41	-.0321	16	-.0242	16	-.0160	17	-.0076	17	+.0009
	36		34		34		33		31
.40	-.0357	16	-.0276	16	-.0194	17	-.0109	17	-.0022

Values of y"

x / y	.00		.05		.10		.15		.20
.60	+.2519	51	+.2266	51	+.2009	52	+.1747	53	+.1480
	4		1		3		6		9
.59	+.2523	51	+.2267	52	+.2006	53	+.1741	54	+.1471
	4		1		2		6		9
.58	+.2527	52	+.2268	53	+.2004	54	+.1735	55	+.1462
	4		0		3		5		9
.57	+.2531	53	+.2268	53	+.2001	54	+.1730	55	+.1453
	4		1		2		7		10
.56	+.2535	53	+.2269	54	+.1999	55	+.1723	56	+.1443
	4		1		3		6		10
.55	+.2539	54	+.2270	55	+.1996	56	+.1717	57	+.1433
	5		1		2		6		11
.54	+.2544	55	+.2271	55	+.1994	5.7	+.1711	58	+.1422
	4		1		3		7		10
.53	+.2548	55	+.2272	56	+.1991	57	+.1704	58	+.1412
	5		1		3		7		11
.52	+.2553	56	+.2273	57	+.1988	58	+.1697	59	+.1401
	5		1		3		7		11
.51	+.2558	57	+.2274	58	+.1985	59	+.1690	60	+.1390
	5		1		3		7		12
.50	+.2563	58	+.2275	59	+.1982	60	+.1683	61	+.1378
	5		1		3		7		11
.49	+.2568	58	+.2276	59	+.1979	61	+.1676	62	+.1367
	5		1		3		8		13
.48	+.2573	59	+.2277	60	+.1976	62	+.1668	63	+.1354
	5		2		3		7		12
.47	+.2578	60	+.2279	61	+.1973	62	+.1661	64	+.1342
	6		1		3		8		13
.46	+.2584	61	+.2280	62	+.1970	63	+.1653	65	+.1329
	5		1		4		9		13
.45	+.2589	62	+.2281	63	+.1966	64	+.1644	66	+.1316
	6		1		4		8		14
.44	+.2595	63	+.2282	64	+.1962	65	+.1636	67	+.1302
	6		2		3		9		14
.43	+.2601	63	+.2284	65	+.1959	66	+.1627	68	+.1288
	6		1		4		9		15
.42	+.2607	64	+.2285	66	+.1955	67	+.1618	69	+.1273
	7		1		4		9		15
.41	+.2614	66	+.2286	67	+.1951	68	+.1609	70	+.1258
	6		2		4		10		15
.40	+.2620	66	+.2288	68	+.1947	70	+.1599	71	+.1243

Values of x"

y \ x	.20		.25		.30		.35		.40
.60	+.0460	14	+.0530	14	+.0602	15	+.0676	15	+.0750
	18		17		17		17		15
.59	+.0442	14	+.0513	14	+.0585	15	+.0659	15	+.0735
	19		18		17		16		16
.58	+.0423	14	+.0495	15	+.0568	15	+.0643	15	+.0719
	20		19		18		17		16
.57	+.0403	15	+.0476	15	+.0550	15	+.0626	15	+.0703
	19		19		18		17		16
.56	+.0384	15	+.0457	15	+.0532	15	+.0609	16	+.0687
	21		19		18		18		17
.55	+.0363	15	+.0438	15	+.0514	15	+.0591	16	+.0670
	21		20		20		19		18
.54	+.0342	15	+.0418	15	+.0494	16	+.0572	16	+.0652
	21		21		20		18		18
.53	+.0321	15	+.0397	15	+.0474	16	+.0554	16	+.0634
	22		21		20		20		18
.52	+.0299	15	+.0376	16	+.0454	16	+.0534	16	+.0616
	23		22		21		20		19
.51	+.0276	16	+.0354	16	+.0433	16	+.0514	17	+.0597
	23		22		21		20		20
.50	+.0253	16	+.0332	16	+.0412	16	+.0494	17	+.0577
	24		24		22		21		20
.49	+.0229	16	+.0308	16	+.0390	17	+.0473	17	+.0557
	25		23		23		22		21
.48	+.0204	16	+.0285	16	+.0367	17	+.0451	17	+.0536
	25		25		24		23		21
.47	+.0179	16	+.0260	17	+.0343	17	+.0428	17	+.0515
	26		25		24		23		22
.46	+.0153	16	+.0235	17	+.0319	17	+.0405	18	+.0493
	27		26		25		24		23
.45	+.0126	17	+.0209	17	+.0294	17	+.0381	18	+.0470
	28		27		26		24		23
.44	+.0098	17	+.0182	17	+.0268	18	+.0357	18	+.0447
	29		27		26		26		24
.43	+.0069	17	+.0155	17	+.0242	18	+.0331	18	+.0423
	29		29		28		26		25
.42	+.0040	17	+.0126	18	+.0214	18	+.0305	19	+.0398
	31		30		28		27		26
.41	+.0009	17	+.0096	18	+.0186	18	+.0278	19	+.0372
	31		30		29		28		27
.40	-.0022	18	+.0066	18	+.0157	19	+.0250	19	+.0345

Values of y"

x / y	.20		.25		.30		.35		.40
.60	+.1480	54	+.1209	55	+.0933	56	+.0652	57	+.0366
	9		12		16		20		24
.59	+.1471	55	+.1197	56	+.0917	57	+.0632	58	+.0342
	9		13		17		20		24
.58	+.1462	56	+.1184	57	+.0900	58	+.0612	59	+.0318
	9		13		17		21		26
.57	+.1453	56	+.1171	58	+.0883	58	+.0591	60	+.0292
	10		14		17		22		26
.56	+.1443	57	+.1157	58	+.0866	59	+.0569	61	+.0266
	10		14		18		22		26
.55	+.1433	58	+.1143	59	+.0848	60	+.0547	61	+.0240
	11		14		19		23		28
.54	+.1422	59	+.1129	60	+.0829	61	+.0524	62	+.0212
	10		15		19		24		28
.53	+.1412	60	+.1114	61	+.0810	62	+.0500	63	+.0184
	11		15		19		24		29
.52	+.1401	60	+.1099	62	+.0791	63	+.0476	64	+.0155
	11		16		20		25		29
.51	+.1390	61	+.1083	62	+.0771	64	+.0451	65	+.0126
	12		16		21		25		31
.50	+.1378	62	+.1067	63	+.0750	65	+.0426	66	+.0095
	11		16		21		26		32
.49	+.1367	63	+.1051	64	+.0729	66	+.0400	67	+.0063
	13		17		22		28		32
.48	+.1354	64	+.1034	65	+.0707	67	+.0372	68	+.0031
	12		18		23		28		34
.47	+.1342	65	+.1016	66	+.0684	68	+.0344	69	-.0003
	13		18		23		28		34
.46	+.1329	66	+.0998	67	+.0661	69	+.0316	71	-.0037
	13		18		24		30		36
.45	+.1316	67	+.0980	69	+.0637	70	+.0286	72	-.0073
	14		19		25		31		37
.44	+.1302	68	+.0961	70	+.0612	71	+.0255	73	-.0110
	14		20		26		32		38
.43	+.1288	69	+.0941	71	+.0586	73	+.0223	74	-.0148
	15		20		26		32		37
.42	+.1273	70	+.0921	72	+.0560	74	+.0191	76	-.0187
	15		21		27		34		41
.41	+.1258	72	+.0900	73	+.0533	75	+.0157	77	-.0228
	15		22		29		35		42
.40	+.1243	73	+.0878	75	+.0504	76	+.0122	78	-.0270

Values of x''

x / y	.40		.45		.50		.55		.60
.60	+.0750	15	+.0826						
	15		14						
.59	+.0735	15	+.0812						
	16		15						
.58	+.0719	16	+.0797						
	16		15						
.57	+.0703	16	+.0782						
	16		16						
.56	+.0687	16	+.0766						
	17		16						
.55	+.0670	16	+.0750	16	+.0832				
	18		16		16				
.54	+.0652	16	+.0734	16	+.0816				
	18		17		15				
.53	+.0634	17	+.0717	17	+.0801				
	18		18		17				
.52	+.0616	17	+.0699	17	+.0784				
	19		18		17				
.51	+.0597	17	+.0681	17	+.0767				
	20		18		17				
.50	+.0577	17	+.0663	17	+.0750	18	+.0839		
	20		19		18		17		
.49	+.0557	17	+.0644	18	+.0732	18	+.0822		
	21		20		18		17		
.48	+.0536	18	+.0624	18	+.0714	18	+.0805		
	21		20		19		18		
.47	+.0515	18	+.0604	18	+.0695	18	+.0787		
	22		21		20		18		
.46	+.0493	18	+.0583	18	+.0675	19	+.0769		
	23		22		20		19		
.45	+.0470	18	+.0561	19	+.0655	19	+.0750	20	+.0848
	23		22		21		20		18
.44	+.0447	18	+.0539	19	+.0634	19	+.0730	20	+.0830
	24		23		22		20		19
.43	+.0423	19	+.0516	19	+.0612	20	+.0710	20	+.0811
	25		24		22		21		20
.42	+.0398	19	+.0492	20	+.0590	20	+.0689	20	+.0791
	26		24		24		22		20
.41	+.0372	19	+.0468	20	+.0566	20	+.0667	21	+.0771
	27		26		24		22		21
.40	+.0345	19	+.0442	20	+.0542	21	+.0645	21	+.0750

Values of y"

y \ x	.40		.45		.50		.55		.60
.60	+.0366	58	+.0075						
	24		28						
.59	+.0342	59	+.0047						
	24		29						
.58	+.0318	60	+.0018						
	26		30						
.57	+.0292	61	-.0012						
	26		30						
.56	+.0266	62	-.0042						
	26		31						
.55	+.0240	63	-.0073	64	-.0392				
	28		32		37				
.54	+.0212	63	-.0105	65	-.0429				
	28		33		38				
.53	+.0184	64	-.0138	66	-.0467				
	29		34		39				
.52	+.0155	65	-.0172	67	-.0506				
	29		35		41				
.51	+.0126	67	-.0207	68	-.0547				
	31		36		41				
.50	+.0095	68	-.0243	69	-.0588	71	-.0941		
	32		37		43		46		
.49	+.0063	69	-.0280	70	-.0631	72	-.0989		
	32		38		44		51		
.48	+.0031	70	-.0318	71	-.0675	73	-.1040		
	34		40		45		51		
.47	-.0003	71	-.0358	72	-.0720	74	-.1091		
	34		40		47		54		
.46	-.0037	72	-.0398	74	-.0767	76	-.1145		
	36		42		49		55		
.45	-.0073	73	-.0440	75	-.0816	77	-.1200	79	-.1594
	37		44		50		57		64
.44	-.0110	75	-.0484	76	-.0866	78	-.1257	80	-.1658
	38		44		52		59		67
.43	-.0148	76	-.0528	78	-.0918	80	-.1316	82	-.1725
	39		47		53		62		69
.42	-.0187	78	-.0575	79	-.0971	81	-.1378	83	-.1794
	41		47		56		63		72
.41	-.0228	79	-.0622	81	-.1027	83	-.1441	85	-.1866
	42		50		57		66		74
.40	-.0270	80	-.0672	82	-.1084	85	-.1507	87	-.1940

Values of x''

x / y	.00		.05		.10		.15		.20		.25
.40	−.0357	16	−.0276	16	−.0194	17	−.0109	17	−.0022	18	+.0066
	36		36		34		34		33		32
.39	−.0393	16	−.0312	17	−.0228	17	−.0143	18	−.0055	18	+.0034
	38		36		36		35		34		32
.38	−.0431	17	−.0348	17	−.0264	17	−.0178	18	−.0089	18	+.0002
	39		39		37		36		35		34
.37	−.0470	17	−.0387	17	−.0301	17	−.0214	18	−.0124	18	−.0032
	40		39		38		37		36		35
.36	−.0510	17	−.0426	17	−.0339	18	−.0251	18	−.0160	19	−.0067
	42		41		40		39		38		36
.35	−.0552	17	−.0467	18	−.0379	18	−.0290	18	−.0198	19	−.0103
	43		42		41		40		38		38
.34	−.0595	17	−.0509	18	−.0420	18	−.0330	19	−.0236	19	−.0141
	45		43		43		41		41		39
.33	−.0640	18	−.0552	18	−.0463	18	−.0371	19	−.0277	19	−.0180
	46		46		44		43		41		40
.32	−.0686	18	−.0598	18	−.0507	19	−.0414	19	−.0318	20	−.0220
	48		47		46		45		44		42
.31	−.0734	18	−.0645	18	−.0553	19	−.0459	19	−.0362	20	−.0262
	50		48		48		46		45		44
.30	−.0784	18	−.0693	18	−.0601	19	−.0505	20	−.0407	20	−.0306
	51		51		49		49		47		46
.29	−.0835	18	−.0744	19	−.0650	19	−.0554	20	−.0454	20	−.0352
	54		53		52		50		49		48
.28	−.0889	18	−.0797	19	−.0702	20	−.0604	20	−.0503	21	−.0400
	56		55		53		52		51		49
.27	−.0945	19	−.0852	19	−.0755	20	−.0656	20	−.0554	21	−.0449
	58		56		56		55		53		52
.26	−.1003	19	−.0908	19	−.0811	20	−.0711	21	−.0607	21	−.0501
	61		60		58		57		56		54
.25	−.1064	19	−.0968	20	−.0869	20	−.0768	21	−.0663	22	−.0555
	63		62		61		59		58		57
.24	−.1127	19	−.1030	20	−.0930	21	−.0827	21	−.0721	22	−.0612
	65		65		64		62		61		59
.23	−.1192	19	−.1095	20	−.0994	21	−.0889	21	−.0782	22	−.0671
	69		67		66		65		63		62
.22	−.1261	20	−.1162	20	−.1060	21	−.0954	22	−.0845	22	−.0733
	72		71		70		69		67		65
.21	−.1333	20	−.1233	21	−.1130	21	−.1023	22	−.0912	23	−.0798
	75		74		72		71		70		68
.20	−.1408	20	−.1307	21	−.1202	22	−.1094	22	−.0982	23	−.0866

Values of y"

x / y	.00		.05		.10		.15		.20		.25
.40	+.2620	66	+.2288	68	+.1947	70	+.1599	71	+.1243	73	+.0878
	7		1		4		10		16		22
.39	+.2627	68	+.2289	69	+.1943	71	+.1589	72	+.1227	74	+.0856
	7		1		4		10		17		24
.38	+.2634	69	+.2290	70	+.1939	72	+.1579	74	+.1210	76	+.0832
	7		2		5		11		17		24
.37	+.2641	70	+.2292	72	+.1934	73	+.1568	75	+.1193	77	+.0808
	8		2		4		11		18		25
.36	+.2649	71	+.2294	73	+.1930	75	+.1557	76	+.1175	78	+.0783
	7		1		5		11		18		26
.35	+.2656	72	+.2295	74	+.1925	76	+.1546	78	+.1157	80	+.0757
	8		2		5		12		20		27
.34	+.2664	73	+.2297	75	+.1920	77	+.1534	79	+.1137	81	+.0730
	9		2		5		12		19		27
.33	+.2673	75	+.2299	77	+.1915	79	+.1522	81	+.1118	83	+.0703
	8		2		5		13		21		29
.32	+.2681	76	+.2301	78	+.1910	80	+.1509	82	+.1097	85	+.0674
	9		2		6		13		21		30
.31	+.2690	77	+.2303	80	+.1904	82	+.1496	84	+.1076	86	+.0644
	9		2		5		14		23		32
.30	+.2699	79	+.2305	81	+.1899	83	+.1482	86	+.1053	88	+.0612
	10		2		6		14		23		32
.29	+.2709	80	+.2307	83	+.1893	85	+.1468	88	+.1030	90	+.0580
	10		2		6		15		24		34
.28	+.2719	82	+.2309	84	+.1887	87	+.1453	89	+.1006	92	+.0546
	10		2		7		16		25		35
.27	+.2729	84	+.2311	86	+.1880	89	+.1437	91	+.0981	94	+.0511
	11		2		6		16		26		37
.26	+.2740	85	+.2313	88	+.1874	91	+.1421	93	+.0955	96	+.0474
	11		3		7		17		28		39
.25	+.2751	87	+.2316	90	+.1867	93	+.1404	95	+.0927	98	+.0435
	12		2		7		17		28		40
.24	+.2763	89	+.2318	92	+.1860	95	+.1387	98	+.0899	101	+.0395
	12		3		8		19		30		43
.23	+.2775	91	+.2321	94	+.1852	97	+.1368	100	+.0869	103	+.0352
	13		3		8		19		32		44
.22	+.2788	93	+.2324	96	+.1844	99	+.1349	102	+.0837	106	+.0308
	13		2		8		20		33		46
.21	+.2801	95	+.2326	98	+.1836	101	+.1329	105	+.0804	108	+.0262
	14		4		9		21		34		49
.20	+.2815	97	+.2330	101	+.1827	104	+.1308	108	+.0770	111	+.0213

Values of x"

x / y	.25		.30		.35		.40		.45		.50
.40	+.0066	18	+.0157	19	+.0250	19	+.0345	19	+.0442	20	+.0542
	32		31		30		28		26		25
.39	+.0034	18	+.0126	19	+.0220	19	+.0317	20	+.0416	20	+.0517
	32		31		30		29		28		25
.38	+.0002	19	+.0095	19	+.0190	20	+.0288	20	+.0388	21	+.0492
	34		33		31		30		28		27
.37	-.0032	19	+.0062	19	+.0159	20	+.0258	20	+.0360	21	+.0465
	35		33		32		31		29		28
.36	-.0067	19	+.0029	20	+.0127	20	+.0227	21	+.0331	21	+.0437
	36		35		34		32		31		29
.35	-.0103	19	-.0006	20	+.0093	20	+.0195	21	+.0300	22	+.0408
	38		37		35		33		32		30
.34	-.0141	20	-.0043	20	+.0058	21	+.0162	21	+.0268	22	+.0378
	40		37		36		35		33		32
.33	-.0180	20	-.0080	20	+.0022	21	+.0127	22	+.0235	22	+.0346
	40		39		38		36		34		32
.32	-.0220	20	-.0119	21	-.0016	21	+.0091	22	+.0201	23	+.0314
	42		41		39		37		36		34
.31	-.0262	20	-.0160	21	-.0055	22	+.0054	22	+.0165	23	+.0280
	44		42		41		40		37		36
.30	-.0306	21	-.0202	21	-.0096	22	+.0014	23	+.0128	23	+.0244
	46		45		42		40		39		36
.29	-.0352	21	-.0247	22	-.0138	22	-.0026	23	+.0089	24	+.0208
	48		46		45		43		41		39
.28	-.0400	21	-.0293	22	-.0183	23	-.0069	23	+.0048	24	+.0169
	49		48		46		45		43		41
.27	-.0449	22	-.0341	22	-.0229	23	-.0114	24	+.0005	25	+.0128
	52		50		48		46		44		42
.26	-.0501	22	-.0391	23	-.0277	23	-.0160	24	-.0039	25	+.0086
	54		52		51		49		47		45
.25	-.0555	22	-.0443	23	-.0328	24	-.0209	25	-.0086	25	+.0041
	57		55		53		51		49		46
.24	-.0612	23	-.0498	23	-.0381	24	-.0260	25	-.0135	26	-.0005
	59		58		56		54		51		49
.23	-.0671	23	-.0556	24	-.0437	25	-.0314	26	-.0186	26	-.0054
	62		60		58		56		54		52
.22	-.0733	23	-.0616	24	-.0495	25	-.0370	26	-.0240	27	-.0106
	65		63		62		59		58		54
.21	-.0798	24	-.0679	24	-.0557	26	-.0429	26	-.0298	28	-.0160
	68		67		64		63		60		58
.20	-.0866	24	-.0746	25	-.0621	26	-.0492	27	-.0358	28	-.0218

Values of y"

x / y	.25		.30		.35		.40		.45		.50
.40	+.0878	75	+.0504	76	+.0122	78	−.0270	80	−.0672	82	−.1084
	22		29		36		44		52		60
.39	+.0856	76	+.0475	78	+.0086	80	−.0314	82	−.0724	84	−.1144
	24		30		38		45		53		61
.38	+.0832	77	+.0445	79	+.0048	81	−.0359	84	−.0777	86	−.1205
	24		31		39		47		55		64
.37	+.0808	79	+.0414	81	+.0009	83	−.0406	85	−.0832	87	−.1269
	25		33		40		49		57		67
.36	+.0783	80	+.0381	82	−.0031	85	−.0455	87	−.0889	89	−.1336
	26		33		42		50		60		69
.35	+.0757	82	+.0348	84	−.0073	86	−.0505	89	−.0949	91	−.1405
	27		35		43		52		62		72
.34	+.0730	83	+.0313	86	−.0116	88	−.0557	91	−.1011	93	−.1477
	27		37		46		55		64		74
.33	+.0703	85	+.0276	88	−.0162	90	−.0612	93	−.1075	95	−.1551
	29		37		46		57		67		78
.32	+.0674	87	+.0239	89	−.0208	92	−.0669	95	−.1142	97	−.1629
	30		39		49		59		70		81
.31	+.0644	89	+.0200	91	−.0257	94	−.0728	97	−.1212	100	−.1710
	32		41		51		61		72		85
.30	+.0612	91	+.0159	93	−.0308	96	−.0789	99	−.1284	102	−.1795
	32		43		53		64		76		89
.29	+.0580	93	+.0116	95	−.0361	98	−.0853	101	−.1360	105	−.1884
	34		44		55		67		80		92
.28	+.0546	95	+.0072	98	−.0416	101	−.0920	104	−.1440	107	−.1976
	35		46		58		70		83		97
.27	+.0511	97	+.0026	100	−.0474	103	−.0990	107	−.1523	110	−.2073
	37		48		60		73		86		101
.26	+.0474	99	−.0022	102	−.0534	106	−.1063	109	−.1609	113	−.2174
	39		51		64		77		91		106
.25	+.0435	102	−.0073	105	−.0598	108	−.1140	112	−.1700	116	−.2280
	40		53		66		80		96		112
.24	+.0395	104	−.0126	108	−.0664	111	−.1220	115	−.1796	119	−.2392
	43		55		69		84		100		117
.23	+.0352	107	−.0181	110	−.0733	114	−.1304	118	−.1896	123	−.2509
	44		58		73		89		105		123
.22	+.0308	109	−.0239	113	−.0806	117	−.1393	122	−.2001	126	−.2632
	46		61		76		93		111		130
.21	+.0262	112	−.0300	116	−.0882	121	−.1486	125	−.2112	130	−.2762
	49		64		81		98		117		137
.20	+.0213	115	−.0364	120	−.0963	124	−.1584	129	−.2229	134	−.2899

Values of x"

x / y	.50		.55		.60		.65		.70		.75	
.40	+.0542	21	+.0645	21	+.0750	22	+.0858					
	25		24		22		20					
.39	+.0517	21	+.0621	21	+.0728	22	+.0838					
	25		24		22		21					
.38	+.0492	21	+.0597	22	+.0706	22	+.0817					
	27		25		24		21					
.37	+.0465	21	+.0572	22	+.0682	23	+.0796					
	28		26		24		23					
.36	+.0437	22	+.0546	22	+.0658	23	+.0773					
	29		27		25		23		21			
.35	+.0408	22	+.0519	23	+.0633	23	+.0750	24	+.0871			
	30		29		27		24		22			
.34	+.0378	22	+.0490	23	+.0606	24	+.0726	25	+.0849			
	32		29		27		26		23			
.33	+.0346	23	+.0461	24	+.0579	24	+.0700	25	+.0826			
	32		31		29		26		24			
.32	+.0314	23	+.0430	24	+.0550	25	+.0674	26	+.0802			
	34		32		30		28		26			
.31	+.0280	24	+.0398	24	+.0520	25	+.0646	26	+.0776			
	36		33		31		28		26		23	
.30	+.0244	24	+.0365	25	+.0489	26	+.0618	26	+.0750	27	+.0887	
	36		35		32		31		28		25	
.29	+.0208	24	+.0330	25	+.0457	26	+.0587	27	+.0722	28	+.0862	
	39		36		35		31		28		26	
.28	+.0169	25	+.0294	26	+.0422	27	+.0556	28	+.0694	28	+.0836	
	41		39		35		34		31		27	
.27	+.0128	25	+.0255	26	+.0387	27	+.0522	28	+.0663	29	+.0809	
	42		40		38		34		32		29	
.26	+.0086	26	+.0215	27	+.0349	28	+.0488	29	+.0631	30	+.0780	
	45		42		39		37		33		30	
.25	+.0041	26	+.0173	27	+.0310	28	+.0451	29	+.0598	30	+.0750	
	46		44		42		38		36		32	
.24	−.0005	27	+.0129	28	+.0268	29	+.0413	30	+.0562	31	+.0718	
	49		47		44		41		37		34	
.23	−.0054	27	+.0082	28	+.0224	30	+.0372	31	+.0525	32	+.0684	
	52		48		46		43		39		35	
.22	−.0106	28	+.0034	29	+.0178	30	+.0329	31	+.0486	33	+.0649	
	54		52		48		45		42		38	
.21	−.0160	28	−.0018	30	+.0130	31	+.0284	32	+.0444	33	+.0611	
	58		55		52		48		44		40	
.20	−.0218	29	−.0073	30	+.0078	32	+.0236	33	+.0400	34	+.0571	

Values of y"

x / y	.50		.55		.60		.65		.70		.75	
.40	-.1084	85	-.1507	87	-.1940	89	-.2385					
	60		68		77		86					
.39	-.1144	86	-.1575	88	-.2017	91	-.2471					
	61		70		80		90					
.38	-.1205	88	-.1645	90	-.2097	93	-.2561					
	64		73		83		93					
.37	-.1269	90	-.1718	92	-.2180	95	-.2654					
	67		77		86		97					
.36	-.1336	92	-.1795	94	-.2266	97	-.2751					
	69		79		90		101					
.35	-.1405	94	-.1874	96	-.2356	99	-.2852	102	-.3363			
	72		82		93		105		117			
.34	-.1477	96	-.1956	99	-.2449	102	-.2957	105	-.3480			
	74		86		98		110		123			
.33	-.1551	98	-.2042	101	-.2547	104	-.3067	107	-.3603			
	78		89		101		114		128			
.32	-.1629	100	-.2131	103	-.2648	107	-.3181	110	-.3731			
	81		93		106		120		134			
.31	-.1710	103	-.2224	106	-.2754	109	-.3301	113	-.3865			
	85		98		111		125		140			
.30	-.1795	105	-.2322	109	-.2865	112	-.3426	116	-.4005	120	-.4603	
	89		101		116		130		146		163	
.29	-.1884	108	-.2423	112	-.2981	115	-.3556	119	-.4151	123	-.4766	
	92		107		121		137		154		172	
.28	-.1976	111	-.2530	114	-.3102	118	-.3693	122	-.4305	127	-.4938	
	97		111		127		144		161		180	
.27	-.2073	114	-.2641	118	-.3229	122	-.3837	126	-.4466	130	-.5118	
	101		117		133		150		170		189	
.26	-.2174	117	-.2758	121	-.3362	125	-.3987	130	-.4636	134	-.5307	
	106		122		140		159		178		200	
.25	-.2280	120	-.2880	124	-.3502	129	-.4146	134	-.4814	139	-.5507	
	112		129		147		167		188		210	
.24	-.2392	123	-.3009	128	-.3649	133	-.4313	138	-.5002	143	-.5717	
	117		135		155		175		198		223	
.23	-.2509	127	-.3144	132	-.3804	137	-.4488	142	-.5200	148	-.5940	
	123		143		163		186		209		235	
.22	-.2632	131	-.3287	136	-.3967	141	-.4674	147	-.5409	153	-.6175	
	130		150		173		196		222		249	
.21	-.2762	135	-.3437	141	-.4140	146	-.4870	152	-.5631	159	-.6424	
	137		159		182		208		235		264	
.20	-.2899	139	-.3596	145	-.4322	151	-.5078	158	-.5866	164	-.6688	

Values of x"

x / y	.06		.08		.10		.12		.14		.16
.20	-.1286	20	-.1245	22	-.1202	21	-.1160	22	-.1116	22	-.1072
	78		77		77		75		75		75
.19	-.1364	21	-.1322	22	-.1279	22	-.1235	22	-.1191	22	-.1147
	81		80		80		80		79		78
.18	-.1445	22	-.1402	22	-.1359	22	-.1315	22	-.1270	22	-.1225
	85		85		84		84		84		83
.17	-.1530	22	-.1487	22	-.1443	22	-.1399	22	-.1354	23	-.1308
	90		89		89		88		88		87
.16	-.1620	22	-.1576	22	-.1532	22	-.1487	22	-.1442	24	-.1395
	94		94		94		93		92		92
.15	-.1714	22	-.1670	22	-.1626	23	-.1580	23	-.1534	24	-.1487
	100		100		99		99		98		98
.14	-.1814	22	-.1770	22	-.1725	23	-.1679	24	-.1632	24	-.1585
	106		105		104		104		104		103
.13	-.1920	22	-.1875	23	-.1829	23	-.1783	24	-.1736	24	-.1688
	111		111		111		110		109		109
.12	-.2031	22	-.1986	23	-.1940	24	-.1893	24	-.1845	24	-.1797
	118		118		117		117		117		116
.11	-.2149	22	-.2104	24	-.2057	24	-.2010	24	-.1962	24	-.1913
	126		125		125		124		124		124
.10	-.2275	23	-.2229	24	-.2182	24	-.2134	24	-.2086	24	-.2037
	133		133		133		133		132		131
.09	-.2408	23	-.2362	24	-.2315	24	-.2267	24	-.2218	25	-.2168
	143		142		142		142		142		141
.08	-.2551	24	-.2504	24	-.2457	24	-.2409	24	-.2360	26	-.2309
	151		152		151		151		151		151
.07	-.2702	23	-.2656	24	-.2608	24	-.2560	24	-.2511	26	-.2460
	163		163		163		163		162		163
.06	-.2865	23	-.2819	24	-.2771	24	-.2723	25	-.2673	25	-.2623
	175		174		175		174		175		174
.05	-.3040	24	-.2993	24	-.2946	24	-.2897	24	-.2848	26	-.2797
	187		188		188		189		188		189
.04	-.3227	23	-.3181	24	-.3134	24	-.3086	25	-.3036	25	-.2986
	203		203		203		204		204		204
.03	-.3430	23	-.3384	24	-.3337	24	-.3290	25	-.3240	25	-.3190
	219		220		221		220		222		223
.02	-.3649	22	-.3604	23	-.3558	24	-.3510	24	-.3462	24	-.3413
	238		239		240		241		242		242
.01	-.3887	22	-.3843	22	-.3798	24	-.3751	24	-.3704	24	-.3655
	259		260		261		263		264		265
.00	-.4146	22	-.4103	22	-.4059	22	-.4014	24	-.3968	24	-.3920

Values of y"

x / y	.06		.08		.10		.12		.14		.16
.20	+.2230	100	+.2030	102	+.1827	102	+.1622	104	+.1413	106	+.1202
	1		4		9		15		19		25
.19	+.2231	102	+.2026	104	+.1818	106	+.1607	106	+.1394	108	+.1177
	1		4		9		15		21		26
.18	+.2232	105	+.2022	106	+.1809	108	+.1592	110	+.1373	111	+.1151
	1		5		10		15		21		28
.17	+.2233	108	+.2017	109	+.1799	111	+.1577	112	+.1352	114	+.1123
	1		4		11		17		23		29
.16	+.2234	110	+.2013	112	+.1788	114	+.1560	116	+.1329	118	+.1094
	1		5		11		17		24		31
.15	+.2235	114	+.2008	116	+.1777	117	+.1543	119	+.1305	122	+.1063
	1		6		12		19		25		32
.14	+.2236	117	+.2002	118	+.1765	120	+.1524	122	+.1280	124	+.1031
	1		5		12		19		27		35
.13	+.2237	120	+.1997	122	+.1753	124	+.1505	126	+.1253	128	+.0996
	1		6		13		21		29		36
.12	+.2238	124	+.1991	126	+.1740	128	+.1484	130	+.1224	132	+.0960
	1		6		14		22		30		39
.11	+.2239	127	+.1985	130	+.1726	132	+.1462	134	+.1194	136	+.0921
	1		7		15		23		32		41
.10	+.2240	131	+.1978	134	+.1711	136	+.1439	138	+.1162	141	+.0880
	2		7		16		25		34		44
.09	+.2242	136	+.1971	138	+.1695	140	+.1414	143	+.1128	146	+.0836
	1		8		17		26		37		47
.08	+.2243	140	+.1963	142	+.1678	145	+.1388	148	+.1091	151	+.0789
	2		8		18		29		39		50
.07	+.2245	145	+.1955	148	+.1660	150	+.1359	154	+.1052	156	+.0739
	1		8		19		30		42		54
.06	+.2246	150	+.1947	153	+.1641	156	+.1329	160	+.1010	162	+.0685
	2		10		21		33		45		58
.05	+.2248	156	+.1937	158	+.1620	162	+.1296	166	+.0965	169	+.0627
	2		10		22		35		49		63
.04	+.2250	162	+.1927	164	+.1598	168	+.1261	172	+.0916	176	+.0564
	2		10		24		39		53		68
.03	+.2252	168	+.1917	172	+.1574	176	+.1222	180	+.0863	184	+.0496
	2		12		27		41		57		75
.02	+.2254	174	+.1905	179	+.1547	183	+.1181	188	+.0806	192	+.0421
	3		13		28		45		62		80
.01	+.2257	182	+.1892	186	+.1519	192	+.1136	196	+.0744	202	+.0341
	2		14		31		49		69		89
.00	+.2259	190	+.1878	195	+.1488	200	+.1087	206	+.0675	212	+.0252

Values of x″

x / y	.16		.18		.20		.22		.24		.26
.20	-.1072	22	-.1027	22	-.0982	23	-.0936	23	-.0890	24	-.0842
	75		75		74		73		72		72
.19	-.1147	22	-.1102	23	-.1056	24	-.1009	24	-.0962	24	-.0914
	78		78		77		77		76		75
.18	-.1225	22	-.1180	24	-.1133	24	-.1086	24	-.1038	24	-.0989
	83		82		82		81		80		80
.17	-.1308	23	-.1262	24	-.1215	24	-.1167	24	-.1118	24	-.1069
	87		86		85		85		85		84
.16	-.1395	24	-.1348	24	-.1300	24	-.1252	24	-.1203	25	-.1153
	92		92		91		90		89		89
.15	-.1487	24	-.1440	24	-.1391	24	-.1342	25	-.1292	25	-.1242
	98		96		97		96		95		94
.14	-.1585	24	-.1536	24	-.1488	25	-.1438	26	-.1387	26	-.1336
	103		103		101		101		101		100
.13	-.1688	24	-.1639	25	-.1589	25	-.1539	26	-.1488	26	-.1436
	109		109		109		107		107		106
.12	-.1797	24	-.1748	25	-.1698	26	-.1646	26	-.1595	26	-.1542
	116′		115		115		115		113		113
.11	-.1913	25	-.1863	25	-.1813	26	-.1761	26	-.1708	26	-.1655
	124		123		122		122		122		121
.10	-.2037	26	-.1986	26	-.1935	26	-.1883	26	-.1830	27	-.1776
	131		132		131		130		130		129
.09	-.2168	25	-.2118	26	-.2066	26	-.2013	26	-.1960	28	-.1905
	141		140		140		140		139		139
.08	-.2309	26	-.2258	26	-.2206	26	-.2153	27	-.2099	28	-.2044
	151		151		151		150		149		149
.07	-.2460	26	-.2409	26	-.2357	27	-.2303	28	-.2248	28	-.2193
	163		162		161		161		162		160
.06	-.2623	26	-.2571	26	-.2518	27	-.2464	27	-.2410	28	-.2353
	174		175		175		175		174		174
.05	-.2797	26	-.2746	26	-.2693	27	-.2639	28	-.2584	28	-.2527
	189		188		189		189		188		189
.04	-.2986	26	-.2934	26	-.2882	27	-.2828	28	-.2772	28	-.2716
	204		205		204		205		206		205
.03	-.3190	26	-.3139	26	-.3086	26	-.3033	28	-.2978	28	-.2921
	223		223		224		223		224		224
.02	-.3413	26	-.3362	26	-.3310	27	-.3256	27	-.3202	28	-.3145
	242		243		244		245		245		246
.01	-.3655	25	-.3605	26	-.3554	26	-.3501	27	-.3447	28	-.3391
	265		267		268		269		270		272
.00	-.3920	24	-.3872	25	-.3822	26	-.3770	26	-.3717	27	-.3663

Values of y"

x / y	.16		.18		.20		.22		.24		.26
.20	+.1202	108	+.0987	108	+.0770	110	+.0550	112	+.0326	114	+.0099
	25		30		36		42		48		54
.19	+.1177	110	+.0957	112	+.0734	113	+.0508	115	+.0278	116	+.0045
	26		32		38		45		51		57
.18	+.1151	113	+.0925	114	+.0696	116	+.0463	118	+.0227	120	−.0012
	28		34		40		47		53		61
.17	+.1123	116	+.0891	118	+.0656	120	+.0416	121	+.0174	124	−.0073
	29		36		43		49		57		64
.16	+.1094	120	+.0855	121	+.0613	123	+.0367	125	+.0117	127	−.0137
	31		37		45		52		59		67
.15	+.1063	122	+.0818	125	+.0568	126	+.0315	128	+.0058	131	−.0204
	32		40		47		55		64		72
.14	+.1031	126	+.0778	128	+.0521	130	+.0260	133	−.0006	135	−.0276
	35		42		50		59		67		76
.13	+.0996	130	+.0736	132	+.0471	135	+.0201	137	−.0073	140	−.0352
	36		45		53		62		71		81
.12	+.0960	134	+.0691	136	+.0418	140	+.0139	142	−.0144	144	−.0433
	39		47		57		66		76		86
.11	+.0921	138	+.0644	142	+.0361	144	+.0073	146	−.0220	150	−.0519
	41		51		60		70		81		92
.10	+.0880	144	+.0593	146	+.0301	149	+.0003	152	−.0301	155	−.0611
	44		54		65		76		87		98
.09	+.0836	148	+.0539	152	+.0236	154	−.0073	158	−.0388	160	−.0709
	47		58		69		81		93		105
.08	+.0789	154	+.0481	157	+.0167	160	−.0154	164	−.0481	166	−.0814
	50		62		74		86		99		114
.07	+.0739	160	+.0419	163	+.0093	166	−.0240	170	−.0580	174	−.0928
	54		66		80		94		108		122
.06	+.0685	166	+.0353	170	+.0013	174	−.0334	177	−.0688	181	−.1050
	58		72		86		100		116		132
.05	+.0627	173	+.0281	177	−.0073	180	−.0434	185	−.0804	189	−.1182
	63		78		93		109		126		144
.04	+.0564	180	+.0203	184	−.0166	188	−.0543	194	−.0930	198	−.1326
	68		84		101		119		137		156
.03	+.0496	188	+.0119	193	−.0267	198	−.0662	202	−.1067	208	−.1482
	75		92		110		129		149		170
.02	+.0421	197	+.0027	202	−.0377	207	−.0791	212	−.1216	218	−.1652
	80		100		120		141		164		188
.01	+.0341	207	−.0073	212	−.0497	218	−.0932	224	−.1380	230	−.1840
	89		109		132		156		180		206
.00	+.0252	217	−.0182	224	−.0629	230	−.1088	236	−.1560	243	−.2046

Table for Transformation of Linear Equations

	x = .00		x = 1.00		y = .00		y = 1.00	
x or y	x"	y"	x"	y"	x"	y"	x"	y"
.00	-.42678	+.33461	+.07500	-4.13626	-.42678	+.33461	+.07500	+.24148
.01	-.40128	+.32988	+.08658	-3.70398	-.42481	+.31705	+.07595	+.23807
.02	-.37780	+.32552	+.09607	-3.34975	-.42281	+.29928	+.07690	+.23466
.03	-.35611	+.32149	+.10399	-3.05418	-.42079	+.28128	+.07785	+.23124
.04	-.33601	+.31776	+.11069	-2.80382	-.41875	+.26306	+.07880	+.22781
.05	-.31733	+.31430	+.11645	-2.58903	-.41667	+.24461	+.07976	+.22438
.06	-.29993	+.31107	+.12144	-2.40272	-.41458	+.22593	+.08072	+.22094
.07	-.28368	+.30805	+.12581	-2.23960	-.41245	+.20701	+.08168	+.21748
.08	-.26847	+.30523	+.12967	-2.09558	-.41030	+.18784	+.08264	+.21403
.09	-.25421	+.30258	+.13310	-1.96750	-.40812	+.16843	+.08361	+.21056
.10	-.24080	+.30009	+.13617	-1.85284	-.40592	+.14877	+.08458	+.20708
.11	-.22817	+.29775	+.13893	-1.74960	-.40368	+.12885	+.08555	+.20360
.12	-.21626	+.29554	+.14144	-1.65616	-.40142	+.10867	+.08652	+.20011
.13	-.20501	+.29345	+.14371	-1.57119	-.39912	+.08822	+.08749	+.19661
.14	-.19436	+.29147	+.14579	-1.49358	-.39680	+.06750	+.08847	+.19310
.15	-.18427	+.28960	+.14770	-1.42241	-.39444	+.04650	+.08945	+.18959
.16	-.17469	+.28782	+.14945	-1.35693	-.39205	+.02521	+.09043	+.18606
.17	-.16559	+.28613	+.15107	-1.29646	-.38963	+.00364	+.09142	+.18253
.18	-.15693	+.28453	+.15257	-1.24046	-.38718	-.01823	+.09240	+.17899
.19	-.14868	+.28299	+.15396	-1.18845	-.38469	-.04040	+.09339	+.17544
.20	-.14081	+.28153	+.15526	-1.14002	-.38216	-.06288	+.09438	+.17188
.21	-.13330	+.28014	+.15647	-1.09481	-.37961	-.08567	+.09537	+.16832
.22	-.12612	+.27881	+.15761	-1.05251	-.37701	-.10879	+.09637	+.16474
.23	-.11925	+.27753	+.15867	-1.01284	-.37438	-.13223	+.09737	+.16116
.24	-.11267	+.27631	+.15967	- .97558	-.37171	-.15600	+.09837	+.15757
.25	-.10636	+.27514	+.16061	- .94050	-.36901	-.18012	+.09937	+.15397
.26	-.10031	+.27402	+.16149	- .90742	-.36626	-.20459	+.10037	+.15036
.27	-.09450	+.27294	+.16233	- .87617	-.36347	-.22941	+.10138	+.14674
.28	-.08891	+.27190	+.16312	- .84661	-.36065	-.25460	+.10239	+.14312
.29	-.08354	+.27090	+.16387	- .81860	-.35778	-.28017	+.10340	+.13948
.30	-.07838	+.26994	+.16458	- .79203	-.35487	-.30611	+.10442	+.13584
.31	-.07340	+.26902	+.16526	- .76678	-.35191	-.33245	+.10543	+.13219
.32	-.06860	+.26813	+.16590	- .74276	-.34891	-.35918	+.10645	+.12853
.33	-.06397	+.26727	+.16652	- .71989	-.34586	-.38632	+.10747	+.12486
.34	-.05951	+.26644	+.16710	- .69807	-.34277	-.41388	+.10850	+.12118
.35	-.05520	+.26564	+.16766	- .67725	-.33963	-.44187	+.10952	+.11750
.36	-.05103	+.26487	+.16819	- .65735	-.33644	-.47029	+.11055	+.11380
.37	-.04700	+.26412	+.16870	- .63831	-.33320	-.49916	+.11159	+.11010
.38	-.04311	+.26340	+.16919	- .62008	-.32991	-.52849	+.11262	+.10638
.39	-.03933	+.26270	+.16966	- .60261	-.32656	-.55829	+.11366	+.10266
.40	-.03568	+.26202	+.17011	- .58585	-.32316	-.58857	+.11469	+.09893

x or y	x = .00		x = 1.00		y = .00		y = 1.00	
	x"	y"	x"	y"	x"	y"	x"	y"
.40	-.03568	+.26202	+.17011	-.58585	-.32316	-.58857	+.11469	+.09893
.41	-.03214	+.26136	+.17054	-.56977	-.31971	-.61934	+.11574	+.09519
.42	-.02871	+.26073	+.17095	-.55431	-.31620	-.65062	+.11678	+.09144
.43	-.02539	+.26011	+.17135	-.53944	-.31263	-.68241	+.11783	+.08768
.44	-.02216	+.25951	+.17173	-.52514	-.30900	-.71473	+.11888	+.08392
.45	-.01903	+.25893	+.17210	-.51136	-.30532	-.74760	+.11993	+.08014
.46	-.01598	+.25836	+.17246	-.49809	-.30156	-.78102	+.12098	+.07635
.47	-.01303	+.25781	+.17280	-.48528	-.29775	-.81501	+.12204	+.07256
.48	-.01015	+.25728	+.17313	-.47293	-.29387	-.84959	+.12310	+.06876
.49	-.00736	+.25676	+.17345	-.46100	-.28992	-.88477	+.12416	+.06494
.50	-.00464	+.25626	+.17376	-.44948	-.28590	-.92057	+.12522	+.06112
.51	-.00200	+.25577	+.17406	-.43834	-.28181	-.95700	+.12629	+.05729
.52	+.00057	+.25529	+.17435	-.42756	-.27765	-.99408	+.12736	+.05345
.53	+.00308	+.25482	+.17462	-.41713	-.27342	-1.03183	+.12843	+.04960
.54	+.00552	+.25437	+.17490	-.40704	-.26910	-1.07027	+.12951	+.04574
.55	+.00790	+.25393	+.17516	-.39725	-.26471	-1.10941	+.13059	+.04187
.56	+.01022	+.25350	+.17541	-.38777	-.26023	-1.14927	+.13167	+.03799
.57	+.01248	+.25308	+.17566	-.37858	-.25568	-1.18988	+.13275	+.03410
.58	+.01469	+.25267	+.17590	-.36965	-.25103	-1.23126	+.13383	+.03020
.59	+.01684	+.25227	+.17613	-.36099	-.24630	-1.27343	+.13492	+.02629
.60	+.01894	+.25188	+.17635	-.35259	-.24148	-1.31640	+.13601	+.02237
.61	+.02099	+.25150	+.17657	-.34442	-.23656	-1.36021	+.13711	+.01845
.62	+.02299	+.25113	+.17679	-.33648	-.23155	-1.40488	+.13820	+.01451
.63	+.02495	+.25077	+.17699	-.32876	-.22643	-1.45043	+.13930	+.01056
.64	+.02686	+.25041	+.17719	-.32126	-.22122	-1.49690	+.14040	+.00661
.65	+.02872	+.25006	+.17739	-.31395	-.21590	-1.54430	+.14151	+.00264
.66	+.03055	+.24973	+.17758	-.30684	-.21047	-1.59267	+.14262	-.00134
.67	+.03234	+.24939	+.17776	-.29992	-.20493	-1.64203	+.14373	-.00532
.68	+.03408	+.24907	+.17794	-.29318	-.19928	-1.69243	+.14484	-.00932
.69	+.03579	+.24895	+.17812	-.28661	-.19350	-1.74388	+.14595	-.01332
.70	+.03746	+.24844	+.17829	-.28020	-.18760	-1.79643	+.14707	-.01734
.71	+.03910	+.24814	+.17846	-.27396	-.18158	-1.85011	+.14819	-.02137
.72	+.04070	+.24784	+.17862	-.26787	-.17542	-1.90496	+.14932	-.02540
.73	+.04227	+.24755	+.17878	-.26193	-.16913	-1.96101	+.15044	-.02945
.74	+.04381	+.24727	+.17894	-.25613	-.16270	-2.01831	+.15157	-.03351
.75	+.04531	+.24699	+.17909	-.25047	-.15613	-2.07689	+.15271	-.03757
.76	+.04679	+.24671	+.17924	-.24494	-.14940	-2.13681	+.15384	-.04165
.77	+.04823	+.24644	+.17938	-.23954	-.14252	-2.19810	+.15498	-.04574
.78	+.04965	+.24618	+.17952	-.23426	-.13548	-2.26081	+.15612	-.04983
.79	+.05104	+.24592	+.17966	-.22911	-.12828	-2.32501	+.15727	-.05394
.80	+.05240	+.24567	+.17980	-.22407	-.12090	-2.39073	+.15841	-.05806

Table for Transformation of Linear Equations

x or y	x = .00		x = 1.00		y = .00		y = 1.00	
	x"	y"	x"	y"	x"	y"	x"	y"
.80	+ .05240	+ .24567	+ .17980	-.22407	-.12090	-2.39073	+ .15841	-.05806
.81	+ .05373	+ .24542	+ .17993	-.21914	-.11335	-2.45803	+ .15956	-.06219
.82	+ .05505	+ .24518	+ .18006	-.21432	-.10561	-2.52697	+ .16072	-.06633
.83	+ .05633	+ .24494	+ .18018	-.20961	-.09768	-2.59762	+ .16187	-.07048
.84	+ .05759	+ .24471	+ .18031	-.20499	-.08956	-2.67003	+ .16303	-.07464
.85	+ .05883	+ .24448	+ .18043	-.20048	-.08122	-2.74428	+ .16419	-.07881
.86	+ .06005	+ .24425	+ .18055	-.19606	-.07268	-2.82042	+ .16536	-.08299
.87	+ .06124	+ .24403	+ .18067	-.19173	-.06391	-2.89855	+ .16652	-.08719
.88	+ .06241	+ .24381	+ .18078	-.18749	-.05491	-2.97873	+ .16769	-.09139
.89	+ .06357	+ .24360	+ .18089	-.18333	-.04567	-3.06105	+ .16887	-.09560
.90	+ .06470	+ .24339	+ .18100	-.17927	-.03618	-3.14559	+ .17004	-.09983
.91	+ .06581	+ .24318	+ .18110	-.17528	-.02643	-3.23245	+ .17122	-.10406
.92	+ .06690	+ .24298	+ .18121	-.17137	-.01641	-3.32172	+ .17241	-.10831
.93	+ .06797	+ .24278	+ .18131	-.16754	-.00611	-3.41350	+ .17359	-.11257
.94	+ .06903	+ .24258	+ .18141	-.16378	+.00448	-3.50790	+ .17478	-.11683
.95	+ .07007	+ .24239	+ .18151	-.16009	+.01538	-3.60504	+ .17597	-.12111
.96	+ .07109	+ .24220	+ .18161	-.15648	+.02661	-3.70504	+ .17717	-.12540
.97	+ .07209	+ .24202	+ .18170	-.15293	+.03816	-3.80802	+ .17836	-.12971
.98	+ .07308	+ .24183	+ .18179	-.14945	+.05007	-3.91412	+ .17956	-.13402
.99	+ .07405	+ .24165	+ .18189	-.14603	+.06235	-4.02348	+ .18077	-.13834
1.00	+ .07500	+ .24148	+ .18198	-.14268	+.07500	-4.13626	+ .18198	-.14268

Transformation of Linear Equations

To transform a linear equation from I.C.I. coordinates into R-U-C-S coordinates, first make two of the following four substitutions, selecting the two which make the second coordinate in each case take a value between 0 and 1: x = 0, x = 1, y = 0, y = 1. In the columns headed by the values substituted, interpolate linearly to obtain the values of x" and y" corresponding to the second coordinates. The selected coordinates paired with their respective second coordinates define two points on a line in the R-U-C-S. diagram and the transformed equation may be written by substituting the four values in the following:

$$y'' = \frac{y''_2 - y''_1}{x''_2 - x''_1} x'' + \left(y''_1 - \frac{y''_2 - y''_1}{x''_2 - x''_1} x''_1\right)$$

Values of y" for given values of y for z = 0.0

y	y"	Δ y"	y	y"	Δ y"
.250	-.5507		.500	-.0588	
		.0333			.0109
.260	-.5174		.510	-.0479	
		.0316			.0106
.270	-.4858		.520	-.0373	
		.0299			.0103
.280	-.4559		.530	-.0270	
		.0284			.0100
.290	-.4275		.540	-.0170	
		.0269			.0097
.300	-.4006		.550	-.0073	
		.0254			.0093
.310	-.3752		.560	+.0020	
		.0241			.0090
.320	-.3511		.570	+.0110	
		.0230			.0088
.330	-.3281		.580	+.0198	
		.0219			.0085
.340	-.3062		.590	+.0283	
		.0208			.0083
.350	-.2854		.600	+.0366	
		.0199			.0080
.360	-.2655		.610	+.0446	
		.0190			.0078
.370	-.2465		.620	+.0524	
		.0182			.0075
.380	-.2283		.630	+.0599	
		.0175			.0073
.390	-.2108		.640	+.0672	
		.0167			.0071
.400	-.1941		.650	+.0743	
		.0160			.0069
.410	-.1781		.660	+.0812	
		.0154			.0068
.420	-.1627		.670	+.0880	
		.0148			.0067
.430	-.1479		.680	+.0947	
		.0142			.0065
.440	-.1337		.690	+.1012	
		.0137			.0063
.450	-.1200		.700	+.1075	
		.0131			.0061
.460	-.1069		.710	+.1136	
		.0126			.0059
.470	-.0943		.720	+.1195	
		.0122			.0058
.480	-.0821		.730	+.1253	
		.0118			.0057
.490	-.0703		.740	+.1310	
		.0115			.0055
.500	-.0588		.750	+.1365	

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