Deviations from 1:1 and numbers of progeny necessary for establishing linkage

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We have found the following table useful when assigning new genes to linkage groups, either with Parental:Recombinant random isolates or with Parental ditype:Nonparental ditype tetrads. The ratios for total numbers through 50 are from Perkins, D.D. 1953 Genetics 38:187-197, and were extracted from tables in Warwick, B.L. Texas Agric. Exper. Sta. Bull. 463:1-28. The ratios for total numbers from 51-100 were obtained using binomial probability paper (Mosteller, F., and J.W. Tukey. J. Amer. Stat. Assoc. 44:174-212).

Smallest numerical ratios showing significant deviation in one direction from 1 : 1

Total numbers	Ratios 5%	2.5%	1%
5	5:0		
6	6:0	6:0	
7	7:0	7:0	7:0
8	7:1	8:0	8:0
9	8:1	8:1	9:0
10	9:1	9:1	10:0
11	9:2	10:1	10:1
12	10:2	10:2	11:1
13	10:3	11:2	12:1
14	11:3	12:2	12:2
15	12:3	12:3	13:2
16	12:4	13:3	14:2
17	13:4	13:4	14:3
18	13:5	14:4	15:3
19	14:5	15:4	15:4
20	15:5	15:5	16:4
21	15:6	16:5	17:4
22	16:6	17:5	17:1
23	16:7	17:6	18:5
24	17:7	18:6	19:5
25	18:7	18:7	19:1

Total numbers	Ratios 5%	2.5%	1%
26	18:8	19:7	20:6
27	19:8	20:7	20:7
28	19:9	20:8	21:7
29	20:9	21:8	22:7
30	20:10	21:9	22:1
31	21:10	22:9	23:8
32	22:10	22:10	23:9
33	22:11	23:10	24:9
34	23:11	24:10	25:9
35	23:12	24:11	25:10
36	24:12	25:11	26:10
37	24:13	25:12	26:11

38	25:13	26:12	27:11
39	26:13	27:12	28:11
40	26:14	27:13	28:12
41	27:14	28:13	29:12
42	27:15	28:14	29:13
43	28:15	29:14	30:13
44	28:16	29:15	31:13
45	29:16	30:15	31:14

Total		Ratios	
numbers 5%	2.5%	1%	
46	30:16	31:15	32:14
47	30:17	31:16	32:15
48	31:17	32:16	33:15
49	31:18	32:17	34:15
50	32:18	33:17	34:16
51	33:18		
52	33:19		
53	34:19		
54	34:20		
55	35:20		
56	35:21		
57	36:21		
58	36:22		
59	37:22		
60	38:22		
61	39:22		
62	39:23		
63	39:24		
64	40:24		

Total	Ratios
numbers 5%	
65	40:25
66	41:25
67	41:26
68	42:26
69	43:26
70	43:27
71	44:27
72	44:28
73	45:28
74	45:29
75	46:29
76	46:30
77	47:30
78	47:31
79	48:31
80	49:31
81	49:32
82	50:32
83	50:33
84	51:33
85	51:34
86	52:34
87	52:35
88	53:35
89	54:35
90	54:61

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91      55:61
92      55:37
93      56:37
94      56:38
95      57:38
96      57:39
97      58:39
98      58:40
99      59:40
100     59:41
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Numerical ratios are those attaining the one-sided significance level shown in percent.