

ROFFMAN SKIP FORMULA.

The number of ways that a term (either forwards, backwards, or diagonal) can fit into a matrix is determined as follows:

(1) Let the number of skips possible in a forward direction on a row of length (r), where r = the number of columns in the matrix, be equal to "Sr."

(2) Likewise, let the number of skips possible in a vertical direction on a column of length (c), where c = the number of rows in the matrix, be equal to "Sc."

(3) The ***Roffman Skip Formula*** for total skips is as follows:

$$\text{Skips} = 2(\text{Sr} + \text{Sc} + 2[\text{Sr}][\text{Sc}]) = 2\text{Sr} + 2\text{Sc} + 4\text{SrSc}.$$

An example of skip value determined through use of the above tables and formula follows: Find the number of skips possible for a 4-letter word in a Matrix 28 columns by 11 rows.

Solution: Skip Tables for words ranging between 3 and 8 letters are found at the bottom of this web page and on pages 215 through 220 in Appendix B to my *Ark Code* book (there is a slight correction below for words 8 letters long). For a 4-letter word use [Table 1B](#). On it find that 28 columns = 9 possible skips forward. Thus Sr = 9. Now note that 11 rows = 3 possible skips vertically. Thus Sc = 3. Now apply the formula which is $\text{Skips} = 2(\text{Sr} + \text{Sc} + 2[\text{Sr}][\text{Sc}]) = 2(9 + 3 + 2(9)(3)) = 2(12 + 54) = 2(66) = 132$ SKIPS. Now, let us suppose that the 4-letter term occurred at skip 100. To get an idea of how likely such a term is to be found at an ELS, search a range of 132 skips, such as from skip 101 to skip 232. The number of "hits" for this term is then divided by letters in the Control (if this is scrambled Torah the number of letters in the Control is the same as in Torah, i.e., 304,805). The quotient is the *Word Frequency Per Letter*. This is multiplied by the number of letters on each matrix to reveal *Word Expectancy Per Matrix*. It is inherent in this procedure that the larger the number of letters in the matrix, the larger the number of placements possible for any given key word at any ELS. **After determining Word Frequency Per Plot we apply the Poisson Equation to see the probability that they are present at least once.** This is necessary to determine a true probability for each word. Just because a word is likely to appear once per plot does not imply it will always be there. Words may average out to many times per plot area without actually being in a given plot of that area. Of course, if the expected frequency is sufficiently high we eventually reach a probability like .9999999 which we simply round off as 1.0.

SKIP TABLES FOR THE ROFFMAN SKIP FORMULA

TABLE 1 A: 3-LETTER WORDS

COLUMNS (C) OR ROWS (R)

SKIPS POSSIBLE FOR 3-LETTER
WORDS

1	0
2	0
3	1
4	1
5	2
6	2
7	3
8	3
9	4
10	4
11	5
12	5
13	6

TABLE 1B- 4-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 4-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 4-LETTER WORDS
1	0	50	16
2	0	51	16
3	0	52	17
4	1	53	17
5	1	54	17
6	1	55	18
7	2	56	18
8	2	57	18
9	2	58	19
10	3	59	19
11	3	60	19
12	3	61	20
13	4	62	20
14	4	63	20
15	4	64	21
16	5	65	21
17	5	66	21
18	5	67	22
19	6	68	22
20	6	69	22
21	6	70	23
22	7	71	23
23	7	72	23
24	7	73	24
25	8	74	24
26	8	75	24
27	8	76	25
28	9	77	25
29	9	78	25
30	9	79	26
31	10	80	26
32	10	81	26
33	10	82	27
34	11	83	27
35	11	84	27
36	11	85	28
37	12	86	28
38	12	87	28
39	12	88	29
40	13	89	29
41	13	90	29
42	13	91	30
43	14	92	30
44	14	93	30
45	14	94	31
46	15	95	31
47	15	96	31
48	15	97	32
49	16	98	32

TABLE 1C – 5-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 5-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 5-LETTER WORDS
1	0	50	12
2	0	51	12
3	0	52	12
4	0	53	13
5	1	54	13
6	1	55	13
7	1	56	13
8	1	57	14
9	2	58	14
10	2	59	14
11	2	60	14
12	2	61	15
13	3	62	15
14	3	63	15
15	3	64	15
16	3	65	16
17	4	66	16
18	4	67	16
19	4	68	16
20	4	69	17
21	5	70	17
22	5	71	17
23	5	72	17
24	5	73	18
25	6	74	18
26	6	75	18
27	6	76	18
28	6	77	19
29	7	78	19
30	7	79	19
31	7	80	19
32	7	81	20
33	8	82	20
34	8	83	20
35	8	84	20
36	8	85	21
37	9	86	21
38	9	87	21
39	9	88	21
40	9	89	22
41	10	90	22
42	10	91	22
43	10	92	22
44	10	93	23
45	11	94	23
46	11	95	23
47	11	96	23
48	11	97	24
49	12	98	24

TABLE 1D - 5-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 6-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 6-LETTER WORDS
1	0	50	9
2	0	51	10
3	0	52	10
4	0	53	10
5	0	54	10
6	1	55	10
7	1	56	11
8	1	57	11
9	1	58	11
10	1	59	11
11	2	60	11
12	2	61	12
13	2	62	12
14	2	63	12
15	2	64	12
16	3	65	12
17	3	66	13
18	3	67	13
19	3	68	13
20	3	69	13
21	4	70	13
22	4	71	14
23	4	72	14
24	4	73	14
25	4	74	14
26	5	75	14
27	5	76	15
28	5	77	15
29	5	78	15
30	5	79	15
31	6	80	15
32	6	81	16
33	6	82	16
34	6	83	16
35	6	84	16
36	7	85	16
37	7	86	17
38	7	87	17
39	7	88	17
40	7	89	17
41	8	90	17
42	8	91	18
43	8	92	18
44	8	93	18
45	8	94	18
46	9	95	18
47	9	96	19
48	9	97	19
49	9	98	19

TABLE 1E - 6-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 7-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 7-LETTER WORDS
1	0	50	8
2	0	51	8
3	0	52	8
4	0	53	8
5	0	54	8
6	0	55	9
7	1	56	9
8	1	57	9
9	1	58	9
10	1	59	9
11	1	60	9
12	1	61	10
13	2	62	10
14	2	63	10
15	2	64	10
16	2	65	10
17	2	66	10
18	2	67	11
19	3	68	11
20	3	69	11
21	3	70	11
22	3	71	11
23	3	72	12
24	3	73	12
25	4	74	12
26	4	75	12
27	4	76	12
28	4	77	12
29	4	78	13
30	4	79	13
31	5	80	13
32	5	81	13
33	5	82	13
34	5	83	13
35	5	84	14
36	5	85	14
37	6	86	14
38	6	87	14
39	6	88	14
40	6	89	14
41	6	90	15
42	6	91	15
43	7	92	15
44	7	93	15
45	7	94	15
46	7	95	15
47	7	96	15
48	7	97	16
49	8	98	16

TABLE 1F - 7-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 7-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 7-LETTER WORDS
1	0	50	8
2	0	51	8
3	0	52	8
4	0	53	8
5	0	54	8
6	0	55	9
7	1	56	9
8	1	57	9
9	1	58	9
10	1	59	9
11	1	60	9
12	1	61	10
13	2	62	10
14	2	63	10
15	2	64	10
16	2	65	10
17	2	66	10
18	2	67	11
19	3	68	11
20	3	69	11
21	3	70	11
22	3	71	11
23	3	72	12
24	3	73	12
25	4	74	12
26	4	75	12
27	4	76	12
28	4	77	12
29	4	78	13
30	4	79	13
31	5	80	13
32	5	81	13
33	5	82	13
34	5	83	13
35	5	84	14
36	5	85	14
37	6	86	14
38	6	87	14
39	6	88	14
40	6	89	14
41	6	90	15
42	6	91	15
43	7	92	15
44	7	93	15
45	7	94	15
46	7	95	15
47	7	96	15
48	7	97	16
49	8	98	16

TABLE 1G - 8-LETTER WORDS

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 8-LETTER WORDS	COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 8-LETTER WORDS
1	0	50	7
2	0	51	7
3	0	52	7
4	0	53	7
5	0	54	7
6	0	55	7
7	0	56	7
8	1	57	8
9	1	58	8
10	1	59	8
11	1	60	8
12	1	61	8
13	1	62	8
14	1	63	8
15	2	64	9
16	2	65	9
17	2	66	9
18	2	67	9
19	2	68	9
20	2	69	9
21	2	70	9
22	3	71	10
23	3	72	10
24	3	73	10
25	3	74	10
26	3	75	10
27	3	76	10
28	3	77	10
29	4	78	11
30	4	79	11
31	4	80	11
32	4	81	11
33	4	82	11
34	4	83	12
35	4	84	12
36	5	85	12
37	5	86	12
38	5	87	12
39	5	88	12
40	5	89	12
41	5	90	13
42	5	91	13
43	6	92	13
44	6	93	13
45	6	94	13
46	6	95	13
47	6	96	13
48	6	97	14
49	7	98	14