

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 $\text{Skips} = 2(\text{Sr} + \text{Sc} + 2[\text{Sr}][\text{Sc}]) = 2(9 + 3 + 2(9)(3)) = 2(12 + 54) = 2(66) = 132 \text{ SKIPS}$. 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.

HOW TO FIND THE CHANCE OF A TERM APPEARING AT LEAST ONCE*

1. FIND PROBABILITY IT DOES NOT OCCUR BY POISSON EQUATION.

$$f(x) = \frac{\text{Lambda } e^{x(-\text{lambda})}}{x!} \quad x = 0; \text{ lambda} = \text{expected frequency per matrix}$$

2. $1 - f(0) =$ THE PROBABILITY OF OCCURRING AT LEAST ONCE.
 (where $f(0)$ = the probability it will not occur)

3. On an Excel or Works spreadsheet, head columns as follows: A: Whatever identifies the calculation; B: Skips Used on the Matrix, C: Number of hits (on *CodeFinder* or similar software) in Skip Range; D: Divide by 304,805 Letters in Torah or Control; E: The Quotient Equals Frequency Per letter; F: E Quotient Multiplied by Letters on Matrix = Word Expenctancy; G: Poisson Equation = $1 - \text{EXP}(-F\#)$ where # equals the row number of the item in column F in question on the spreadsheet. If you want to know the chance for the item to be on the matrix, head column H accordingly. The value of column H will be the reciprocal of the value found in column G by Poisson Eqiation.

* Note: While this author (Barry S. Roffman) discovered the *Roffman Skip Formula*, my eldest son (an MIT graduate), Rabbi Moshe Roffman, is the author of the spreadsheets and the man who first introduced use of the Poisson Equation into my research.

To fully understand this method, the accuracy of which has been confirmed by Monte Carlo permutation programs, it is best to purchase a copy of ARK CODE. The Appendix of that book offers a 38 page discussion of this method and all procedures required to arrive at a proper statistical evaluation for any Torah Codes matrix.

Ark Code

Appendix B

SKIP TABLES TO BE
EMPLOYED WITH THE
ROFFMAN SKIP FORMULA

Table 1A - HORIZONTAL/VERTICAL SKIPS POSSIBLE FOR A 3-LETTER WORD

<u>COLUMNS (C) OR ROWS (R).</u>	<u>SKIPS POSSIBLE FOR 3-LETTER WORDS</u>
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

NOTE: NORMALLY
INTERVALS OF 4
OR MORE ARE
REJECTED AS TOO
FAR APART.

TABLE 1B – HORIZONTAL/VERTICAL SKIPS FOR A 4-LETTER WORD

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 4-LETTER WORDS	COLUMNS OR ROWS	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 IC – HORIZONTAL/VERTICAL SKIPS FOR A 5-LETTER WORD

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 5-LETTER WORDS	COLUMNS OR ROWS	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 1E - HORIZONTAL/VERTICAL SKIPS FOR A 7-LETTER WORD

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 7-LETTER WORDS	COLUMNS OR ROWS	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	11
24	3	73	12
25	4	74	12
26	4	75	12
27	4	76	12
28	4	77	12
29	4	78	12
30	4	79	13
31	5	80	13
32	5	81	13
33	5	82	13
34	5	83	13
35	5	84	13
36	5	85	14
37	6	86	14
38	6	87	14
39	6	88	14
40	6	89	14
41	6	90	14
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 – HORIZONTAL/VERTICAL SKIPS FOR AN 8-LETTER WORD

COLUMNS (C) OR ROWS (R)	SKIPS POSSIBLE FOR 8-LETTER WORDS	COLUMNS OR ROWS	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	11
35	4	84	11
36	5	85	12
37	5	86	12
38	5	87	12
39	5	88	12
40	5	89	12
41	5	90	12
42	5	91	12
43	6	92	13
44	6	93	13
45	6	94	13
46	6	95	13
47	6	96	13
48	6	97	13
49	6	98	13

Torah Code Restrictions and Modification to Probability Calculations.

With time the value of short ELSs that were not at skips +1, -1, N or -N where N is the skip of the axis term has come into question by me and a number of other Torah Codes experts. Therefore, the following modifications have been built into my work for most if the last 10 years:

- (1) Emphasize key words found at skip +1 by just using their frequency at skip +1 alone. This usually (but not always) equates to their frequency in the open text, the exception being when two sequential words make up one larger word with a different meaning.
- (2) Emphasize key words found at skip -1, N and -N where N is the axis term skip by just using their frequencies at -1, N, -N and also +1.
- (3) Reject any matrix with an axis term less than 6 letters in length.
- (4) Reject any matrix with no axis term that is just a mix of short 3 to 5 letter ELSs.
- (5) Reject any 3-letter ELS that does not have its letters within three letters of each other.
- (6) While I may show them and while I often discuss them, I reject all a-posteriori finds for calculation purposes.
- (7) I would never do a matrix based on a year as an axis term because it is too short and because I have seen many thousands of times that years are not statistically important, or to phrase it another way, there is no evidence seen that dating events was a purpose of the Code. This fits in with the concept that God, in His mercy, hides the date of death for most people.
- (8) Axis terms that can found at a single ELS like **Ark** of the **Covenant** (in Hebrew *alef resh vav nun bet resh yud tav*) are never split into two spatially separated words like Ark and Covenant. The term must appear as 8 letters in sequence as it appears in Torah; or as 9 letters in sequence as it appears in the 3rd to 6th chapters of Joshua as **Ark of THE Covenant** (*alef resh vav nun hey bet resh yud tav*).
- (9) Because many names require at wrapped search (more than 1 computer pass through the Torah's 304,805 letters) to find, the wrapped search is the method used to find the name rather than splitting it.
- (10) Where a full first and last name can not be found at an ELS even in a wrapped search, the first name initial and last name are sought. This generally occurs where a name has any of the follow letters: multiple samechs, tets, gimels and zayins. In such cases, if the name is just a transliteration, a shin/sin may be substituted for a samech, and a tav may be substituted for a tet.

I do not assign any significance to the axis term, no matter how long (although it is extremely rare that I ever find one over 10 letters in length).