A HANDBOOK OF INTEGER SEQUENCES

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To John Riordan

CONTENTS

PREFACE

In spite of the large number of existing mathematical tables, until now there has been no table of sequences of integers. Thus someone coming across the sequence 1, 2, 5, 15, 52, 203, 877, 4140, . . . would have had difficulty in finding out that these are the Bell numbers, and that they have been extensively studied. This handbook remedies this situation. The main table contains a list of some 2300 sequences of integers, collected from all branches of mathematics and science. The sequences are arranged in numerical order, and for each one a brief description and a reference is given.

The first part of the book describes how to use the table, gives methods for analyzing unknown sequences, and contains an illustrated description of the most important sequences.

Who will use this handbook? Anyone who has ever been confronted with a strange sequence, whether in an intelligence test in high school, e.g.,

1, 8, 11, 69, 88, 96, 101, 111, 181, 609, . . .

(guess![1]), or in solving a mathematical problem, e.g.,

1, 2, 5, 14, 42, 132, 429, 1430, . . .

(the Catalan numbers), or from a counting problem, e.g.,

1, 1, 2, 4, 9, 20, 48, 115, 286, 719, . . .

(the number of rooted trees with n points), or in physics, e.g.,

1, 0, 3, 22, 192, 2046, 24853, . . .

[1]For many more terms and the explanation, see the main table.

coefficients of the partition function for a cubic lattice), or in chemistry, :.g.,

$$1, 1, 1, 2, 3, 5, 9, 18, 35, 75, 159, \ldots$$

the number of distinct hydrocarbons of the methane series), or in elec-rical engineering, e.g.,

$$3, 7, 46, 4336, 134281216, \ldots$$

the number of Boolean functions of n variables), will find this handbook ıseful.

Besides identifying sequences, the handbook will serve as an index to he literature for locating references on a particular problem, and for ıuickly finding numbers like 7^{12}, the number of partitions of 30, the 18th ⊐atalan number, or the expansion of π to 60 decimal places. It might also ›e useful to have around when the first signals arrive from Betelgeuse sequence ***2311*** for example would be a friendly beginning).

ACKNOWLEDGMENTS

This book was begun at Cornell University in the years 1965–1969, and finished at Bell Telephone Laboratories from 1969 to 1972. During that time I have been sustained by the support and encouragement of Richard Guy of the University of Alberta, Ron Graham and Henry Pollak of Bell Telephone Laboratories, John Riordan of Rockefeller University, and Ann Snitow of Rutgers University. Most of the sequences were found by searching through the stacks of the libraries of Cornell University, Brown University, and Bell Telephone Laboratories, and I thank the staffs of these excellent libraries for their patience and cooperation. Other sequences were suggested by friends and correspondents, to all of whom I am most grateful. E. R. Berlekamp, J. J. Cannon, D. G. Cantor, B. Ganter, F. Harary, D. E. Knuth, Shen Lin, W. F. Lunnon, R. C. Read, P. R. Stein, and J. W. Wrench, Jr. have been especially helpful. Finally I thank Eleanor Potter and Herman P. Robinson for a thorough reading of the manuscript.

The table was produced by first recording the sequences on punched cards, and (except when the sequence was generated by the author) comparing a listing of the cards with the original tables. These cards were then stored on magnetic tape, and the table has been typeset automatically from this tape. My thanks are due to the staff of the Bell Laboratories computation center at Murray Hill, especially the keypunch operators, for their untiring assistance.

ABBREVIATIONS

Abbreviations of the references are listed in the bibliography

$[a]$	the largest integer $\leq a$
$a ** b$	a^b
$C(i, j)$	the binomial coefficient $\binom{i}{j}$
$\exp(a)$	e^a
gf	generating function
LCM	least common multiple
REF	reference(s)
seq.	sequence

CHAPTER 1

DESCRIPTION OF THE BOOK

It is the fate of those who toil at the lower employments of life, to be driven rather by the fear of evil, than attracted by the prospect of good; to be exposed to censure, without hope of praise; to be disgraced by miscarriage, or punished for neglect, where success would have been without applause, and diligence without reward.

Among these unhappy mortals is the writer of dictionaries; whom mankind have considered, not as the pupil, but the slave of science, the pionier of literature, doomed only to remove rubbish and clear obstructions from the paths of Learning and Genius, who press forward to conquest and glory, without bestowing a smile on the humble drudge that facilitates their progress. Every other authour may aspire to praise; the lexicographer can only hope to escape reproach, and even this negative recompense has yet been granted to very few.

Samuel Johnson, Preface to the "Dictionary," 1755

1.1 DESCRIPTION OF A TYPICAL ENTRY

The main table is a list of about 2300 sequences of integers. A typical entry is:

256 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269 **FIBONACCI NUMBERS A(N) = A(N − 1) + A(N − 2). REF HW1 148. REC 11 20 62. HO1.**

and consists of the following items:

256	the sequence identification number
1, 2, 3, 5, 8, 13, 21, . . .	the sequence itself
FIBONACCI NUMBERS A(N) = A(N − 1) + A(N − 2)	a name or descriptive phrase (in this case a recurrence) for the sequence
REF	references

W1 148 G. H. Hardy and E. M. Wright, "An Introduction to the Theory of Numbers," Oxford Univ. Press, 3rd ed., page 148, 1954

EC 11 20 62 *Recreational Mathematics Magazine*, Volume 11, page 20, 1962.

O1 V. E. Hoggatt, Jr., "Fibonacci and Lucas Numbers," Houghton Mifflin, Boston, 1969

1.2 ARRANGEMENT

The entries are arranged in lexicographic order, so that sequences eginning 1, 2, 1 come before those beginning 1, 2, 2, and so on.

1.3 NUMBER OF TERMS GIVEN

Whenever possible enough terms are given to fill two lines. If fewer erms are given, it is because they have never been calculated so far as ne author knows. (He would be very pleased to be corrected.) Finding ne next term in the following sequences is known to be difficult (others of similar type can be located via the index):

1, 48, 66–68, 124, 125, 129, 142, 143, 149, 150, 181, 189, 195, 226, 246, 48, 271, 304, 309, 317, 321–325, 329, 330, 358, 373, 380, 393, 435, 450, 65, 477, 516, 559–561, 580, 581, 595, 596, 614, 615, 621, 648, 650, 730, 31, 745, 757, 782, 788, 809, 812, 911, 954, 972, 994, 998, 1052, 1099, 115, 1133, 1167, 1210, 1244, 1245, 1339, 1340, 1403, 1404, 1467, 1518, 537, 1803, 2248, 2342.

hese sequences all represent unsolved problems.

1.4 REFERENCES

To conserve space, journal references are extremely abbreviated. They sually give the exact page on which the sequence may be found, but either the author nor the title of the article. To find out more the reader ıust go to a library; this book is meant to used in conjunction with a brary. Quite a small one will do. A considerable fraction of the sequences vill be found in the following nine great works:

ndexes	Dickson [D12] Lehmer [LE1] Fletcher, Miller, Rosenhead, and Comrie [FMR]
ables	Davis [DA2] Abramowitz and Stegun [AS1] David, Kendall, and Barton [DKB]
ombinatorics	Riordan [R1] David and Barton [DB1] Comtet [CO1]

and in four journals:

American Mathematical Monthly [AMM]
Fibonacci Quarterly [FQ]
Journal of Combinatorial Theory [JCT]
Mathematics of Computation [MTAC]

Unusual sequences may send the reader to more exotic sources, but in any case he should first check Chapter III where additional information about some of the commoner sequences is given, and the index to see if other sequences (and hence references) of a similar type are listed.

Journal references usually give volume, page, and year, in that order. (See the example at beginning of this chapter.) Years after 1899 are abbreviated, by dropping the 19. Earlier years are not abbreviated. Sometimes to avoid ambiguity we use the more expanded form of: journal name (series number), volume number (issue number), page number, year.

References to books give volume (if any) and page. (See the example at the beginning of this chapter.)

The references do not attempt to give the discoverer of a sequence, but rather the most extensive table of the sequence that has been published.

1.5 WHAT SEQUENCES ARE INCLUDED?

Rule 1 The sequence must consist of nonnegative integers. (Sequences alternating in sign have been replaced by their absolute values. Interesting sequences of fractions have been entered by numerators and denominators separately. Some sequences of real numbers have been replaced by their integer parts, others by the nearest integers.)

Rule 2 The sequence must be infinite.

A few, like the Mersenne primes, have been given the benefit of the doubt.

Rule 3 The first two terms must be 1, n, where n is between 2 and 999.

An initial 1 has been silently inserted before the first term if this is greater than 1, and extra 1's and 0's at the beginning have been silently deleted. (See the beginning of Chapter II for examples.)

Rule 3 Enough terms must be known to separate the sequence from its neighbors in the table.

Rule 4 The sequence should have appeared in the scientific literature, and must be well-defined and interesting.

The selection has inevitably been subjective, but the goal has been to ude a broad variety of sequences and as many as possible.

1.6 HOW ARE ARRAYS OF NUMBERS TREATED?

\rrays of numbers (binomial coefficients, Stirling numbers of the first l, etc.) have been entered by rows, columns, or diagonals, whichever ned appropriate.

1.7 SUPPLEMENTS

t is planned to issue supplements to the Handbook from time to time, taining new sequences and corrections and extensions to the original uences. Readers wishing to receive these supplements should notify author.

CHAPTER
II

HOW TO HANDLE A STRANGE SEQUENCE

2.1 HOW TO SEE IF A SEQUENCE IS IN THE TABLE

Obtain as many terms of the sequence as possible. The initial terms are handled as follows: Recall that the sequence must begin 1, n, where n is between 2 and 999. Find the first term in the sequence that is greater than 1, and replace all the terms that come before it by a single 1. Then look it up in the table. The initial 1 is just a marker, and need not be in the original sequence. For example, if the sequence begins

1, 2, 3, 5, 8, 13, . . .	see under	1, 2, 3, 5, 8, 13, . . .
2, 3, 5, 8, 13, . . .	see under	1, 2, 3, 5, 8, 13, . . .
−1, 1, 0, 1, 1, 2, 3, 5, 8, . . .	see under	1, 2, 3, 5, 8, . . .
1, 0, 0, 2, 24, 552, 21280, . . .	see under	1, 2, 24, 522, 21280, . . .

2.2 IF THE SEQUENCE IS NOT IN THE TABLE

(i) Try changing or redefining the sequence. Some typical changes are inserting or deleting an initial term (e.g., seq. ***46*** occurs as both 1, 2, 1, 2, 3, 6, 9, 18, . . . and 1, 2, 3, 6, 9, 18, . . .); adding or subtracting 1 or 2 from all the terms (e.g., seq. ***309*** occurs as both 1, 2, 3, 6, 20, 168, . . . and 1, 4, 18, 166, . . .); and multiplying all the terms by 2 or dividing by any common factor.

(ii) If all these methods fail, and it seems certain that the sequence is not in this handbook, please send the sequence and anything that is known about it, including appropriate references, to the author for possible inclusion in later editions.[1]

[1]Address: Mathematics Research Center, Bell Telephone Laboratories, Inc., Murray Hill, New Jersey 07974.

2.3 FINDING THE NEXT TERM

Suppose the beginning of a sequence is given as

0	1	2	3	4	5	6	7
a_0	a_1	a_2	a_3	a_4	a_5	a_6	a_7

1 a rule or explanation for it is desired. If nothing is known about the tory of the sequence or if it is an arbitrary sequence, nothing can be d and any continuation is possible. (Any $n+1$ points can be fitted by nth degree polynomial.)

But the sequences normally encountered, and those in this handbook, distinguished in that they have been produced in some intelligent and tematic way. Occasionally such sequences have a simple explanation, l if so, the methods given below may help to find it. These methods ı be divided roughly into two classes: those which look for a systematic y of generating the nth term a_n from the terms $a_0, \ldots, a_{n-1}$ before it, ., $a_n = a_{n-1} + a_{n-2}$, i.e., methods which seek an internal explanation; l those which look for a systematic way of going from n to a_n, e.g., a_n is number of divisors of n, or the number of trees with n nodes, or the prime number, i.e., methods which seek an external explanation. The mer methods are described in the rest of this chapter, the latter in apter III.

In practice it is usually clear for one reason or another when a correct ılanation for a sequence has been found.

For the related problems of defining the complexity of a sequence, l extrapolating a sequence of real numbers, see the interesting work Martin-Lof [IC 9 602 66] and Fine [IC 16 331 70 and FI1].)

2.4 LOOK FOR A RECURRENCE

Let the sequence be $a_0, a_1, a_2, a_3, \ldots$. Is there a systematic way of ting the nth term a_n from the preceding terms $a_{n-1}, a_{n-2}, \ldots$? A rule doing this, such as $a_n = a_{n-1}^2 - a_{n-2}$, is called a *recurrence*, and of ırse provides a method for getting as many terms of the sequence as ired.

In studying sequences and recurrences it is useful to define a *generat- function* (gf) associated with the sequence, usually an ordinary gf:

$$A(x) = a_0 + a_1x + a_2x^2 + a_3x^3 + \cdots,$$

sometimes an exponential gf:

$$E(x) = a_0 + a_1\frac{x}{1!} + a_2\frac{x^2}{2!} + a_3\frac{x^3}{3!} + \cdots.$$

(These are formal power series having the sequence as coefficients; questions of convergence do not arise.)

Once a recurrence has been found for the sequence, techniques for solving it will be found in the works by Riordan [R1 19], Batchelder [BAT], and Levy and Lessman [LE2].

For example, consider seq. *256*, the Fibonacci numbers: 1, 1, 2, 3, 5, 8, 13, 21, 34, ... These are generated by the recurrence $a_n = a_{n-1} + a_{n-2}$, and from this it is not difficult to obtain the generating function

$$1 + x + 2x^2 + 3x^3 + 5x^4 + \cdots = \frac{1}{1 - x - x^2},$$

and the explicit formula for the nth term

$$a_n = \frac{1}{\sqrt{5}}\left[\left(\frac{1+\sqrt{5}}{2}\right)^{n+1} - \left(\frac{1-\sqrt{5}}{2}\right)^{n+1}\right].$$

2.4.1 METHOD OF DIFFERENCES

This is the standard method for finding recurrences. In simple cases, it will even find an explicit formula for the nth term of a sequence, e.g., if this is a polynomial (such as $a_n = n^2 + 1$) or a simple exponential (such as $a_n = 2^n + n + 1$).

If the sequence is

$$a_0, a_1, a_2, a_3, a_4, \ldots,$$

its first differences are the numbers

$$\Delta a_0 = a_1 - a_0, \quad \Delta a_1 = a_2 - a_1, \quad \Delta a_2 = a_3 - a_2, \quad \ldots,$$

its second differences are

$$\Delta^2 a_0 = \Delta a_1 - \Delta a_0, \quad \Delta^2 a_1 = \Delta a_2 - \Delta a_1, \quad \Delta^2 a_2 = \Delta a_3 - \Delta a_2, \quad \ldots,$$

and so on. The 0th differences are the original sequence: $\Delta^0 a_0 = a_0$, $\Delta^0 a_1 = a_1$, $\Delta^0 a_2 = a_2, \ldots$; and the mth differences are

$$\Delta^m a_n = \Delta^{m-1} a_{n+1} - \Delta^{m-1} a_n$$

or, in terms of the original sequence,

$$\Delta^m a_n = \sum_{i=0}^{m} (-1)^i \binom{m}{i} a_{m+n-i}. \tag{1}$$

Therefore if the differences of some order can be identified, Eq. (1) gives a recurrence for the sequence.

-urthermore, if the differences a_k, Δa_k, $\Delta^2 a_k$, $\Delta^3 a_k$, . . . are known for ıe fixed value of k, then a formula for the nth term is given by

$$a_{n+k} = \sum_{m=0}^{n} \binom{n}{m} \Delta^m a_k . \qquad (2)$$

-xample (i) Seq. ***1562***

n	1	2	3	4	5	6	7	8
a_n	1	5	12	22	35	51	70	92
a_n	4	7	10	13	16	19	22	
a_n	3	3	3	3	3	3		
a_n	0	0	0	0	0			

-ince $\Delta^2 a_n = 3$, $\Delta a_{n+1} - \Delta a_n = 3$, or $a_{n+2} - 2a_{n+1} + a_n = 3$, a recur-ce for the sequence. An explicit formula is obtained from Eq. (2) with 1:

$$a_{n+1} = 1 + 4\binom{n}{1} + 3\binom{n}{2} = 1 + 4n + \frac{3}{2}n(n-1) = \frac{1}{2}(n+1)(3n+2).$$

n general, if the mth differences are zero, a_n is a polynomial in n of ree $m-1$.

-xample (ii) Seq. ***1382***

n	1	2	3	4	5	6	7
a_n	1	4	11	26	57	120	247
Δa_n	3	7	15	31	63	127	
$\Delta^2 a_n$	4	8	16	32	64		

Here $\Delta^2 a_n = 2^{n+1}$, $\Delta a_n = 2^{n+1} - 1$, and $a_n = 2^{n+1} - n - 2$. Equation gives the same answer.

-xample (iii) Seq. ***552*** (the Pell numbers)

n	1	2	3	4	5	6	7
a_n	1	2	5	12	29	70	169
Δa_n	1	3	7	17	41	99	
$\Delta^2 a_n$	2	4	10	24	58		
$\frac{1}{2}\Delta^2 a_n$	1	2	5	12	29		

-ince $\frac{1}{2}\Delta^2 a_n = a_n$, Eq. (1) gives the recurrence $a_{n+2} - 2a_{n+1} - a_n = 0$. lculating further differences shows that $\Delta^m a_1 = 2^{[m/2]}$ and so Eq. (2) es the formula

$$a_{n+1} = \sum_{m=0}^{n} \binom{n}{m} 2^{[m/2]}.$$

Example (iv) Seq. ***469***

n	1	2	3	4	5	6	7	8
a_n	1	2	4	10	26	76	232	764
Δa_n	1	2	6	16	50	156	532	
$n^{-1}\Delta a_n$	1	1	2	4	10	26	76	

Notice that Δa_n is divisible by n, and in fact $n^{-1}\Delta a_n = a_{n-1}$, so that $a_{n+1} = a_n + na_{n-1}$. Again Eq. (2) gives a formula for a_n.

2.4.2 Other Methods of Attack

Is the sequence close to a known sequence, such as the powers of 2? If so, try subtracting off the known sequence. For example, seq. ***1382*** (again): 1, 4, 11, 26, 57, 120, 247, 502, 1013, 2036, 4083, ... The last four numbers are close to powers of 2: 512, 1024, 2048, 4096; and then it is easy to find $a_n = 2^n - n - 1$.

Is a simple recurrence such as $a_n = \alpha a_{n-1} + \beta a_{n-2}$ likely? For this to happen, the ratio $\rho_n = a_{n+1}/a_n$ of successive terms must approach a constant as n increases. Use the values a_2 to a_5 to determine α and β and then see if a_6, a_7, . . . are generated correctly.

If the ratio ρ_n has first differences which are approximately constant, this suggests a recurrence of the type $a_n = \alpha n a_{n-1} + \cdots$. For example, seq. ***704***: 1, 2, 7, 30, 157, 972, 6961, 56660, 516901, . . . has successive ratios 2, 3.5, 4.29, 5.23, 6.19, 7.16, 8.14, 9.12, . . . with differences approaching 1, suggesting $a_n = na_{n-1} + ?$. Subtracting na_{n-1} from a_n, we obtain the original sequence 0, 1, 2, 7, 30, 157, 972, . . . again, so $a_n = na_{n-1} + a_{n-2}$.

This example illustrates the principle that whenever $\rho_n = a_{n+1}/a_n$ seems to be close to a recognizable sequence r_n, one should try to analyze the sequence $b_n = a_{n+1} - r_n a_n$.

A recurrence of the form $a_n = na_{n-1} +$ (small term) can be identified by the fact that the 10th term is approximately 10 times the 9th. For example, seq. ***766***: 0, 1, 2, 9, 44, 265, 1854, 14833, 133496, 1334961, . . . , $a_n = na_{n-1} + (-1)^n$.

The recurrence $a_n = a_{n-1}^2 + \cdots$ is characterized by the fact that each term is about twice as long as the one before. For example, seq. ***331***: 1, 2, 3, 7, 43, 1807, 3263443, 10650056950807, . . . , and $a_n = a_{n-1}^2 - a_{n-1} + 1$.

2.4.3 Factorizing

Does the sequence, or one obtained from it by some simple operation, have many factors?

Example (i) Seq. ***1614***: 1, 5, 23, 119, 719, 5039, 40319, ... As it stands, the sequence cannot be factored, since 719 is prime, but the addin of 1 to all the terms gives the highly composite sequence 2, 6 = 2 · 3, = 2 · 3 · 4, 120 = 2 · 3 · 4 · 5, . . ., which are the factorial numbers (see ction 3.13).

The presence of only small primes may also suggest binomial coeffi- nts:

Example (ii) Seq. ***577*** (the Catalan numbers): 1, 2, 5, 14 = 2 · 7, = 2 · 3 · 7, 132 = 4 · 3 · 11, 429 = 3 · 11 · 13, 1430 = 2 · 5 · 11 · 13, 4862 2 · 11 · 13 · 17, . . . and

$$a_n = \frac{1}{n+1}\binom{2n}{n}$$

e Section 3.5).

Sequences arising in number theory are sometimes *multiplicative*, i.e., ve the property that $a_{mn} = a_m a_n$ whenever m and n have no common tor. For example, seq. ***86***: 1, 2, 2, 3, 2, 4, 2, 4, . . ., the number of isors of n.

.4 Self-Generating Sequences

This section describes some recurrences of a simple yet unusual type. ey have been called (rather arbitrarily) *self-generating*.

In the first two examples let $A = \{a_0 = 1, a_1, a_2, \ldots\}$ be a sequence 1's and 2's.

(i) If every 1 in A is replaced by 1, 2 and every 2 by 2, 1 a new se- ence A' is obtained. Imposing the condition that $A = A'$ forces A to be . ***71***: 1, 2, 2, 1, 2, 1, 1, ... Sequences ***21*** and ***36*** are of the same type.

(ii) Let $A'' = \{b_0, b_1, b_2, \ldots\}$, where b_n is the length of the nth run in (A *run* is a maximal string of identical symbols.) The condition $A = A''$ ces A to be seq. ***70***: 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, ...

In the remaining examples, $A = \{a_0 = 1, a_1, a_2, \ldots\}$ is a nondecreas- sequence of integers.

(iii) Let c_n be the number of times n occurs in A, for $n = 1, 2, \ldots$. If $= n$, A is seq. ***89***: 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, ... If $c_n = a_{n-1}$, A is seq. ***91***: 2, 2, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6, 6, ... (Seq. ***965*** is related to the latter quence.)

(iv) The condition that $a_{n+1} - a_n$ be the smallest positive integer not ual to $a_i - a_j$ for any $i,j \leqslant n$ forces a to be seq. ***416***: 1, 2, 4, 8, 13, 21, ... e conditions $a_0 = 1$, $a_2 = 2$, and that a_n be the smallest integer which n be written uniquely as the sum of two distinct preceding terms force to be seq. ***201***: 1, 2, 3, 4, 6, 8, 11, 13, ... Sequences ***231***, ***254***, ***425***, and 9 have similar explanations.

CHAPTER

III

ILLUSTRATED DESCRIPTION OF SOME IMPORTANT SEQUENCES

While Chapter II studied ways of getting the nth term of a sequence from the preceding terms, this chapter considers externally generated sequences, such as the sequences in which the nth term is the number of graphs with n nodes or the nth triangular number. An informal and illustrated description is given of some of the most important such sequences.

3.1 GRAPHS AND TREES

Stated informally, a *graph* consists of a finite set of points (or nodes) some of which are joined by lines (or edges). Figure 1 illustrates seq. ***479***, the number of graphs with n nodes.

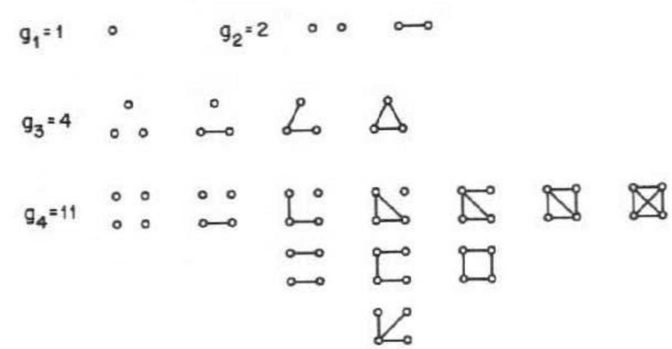

Fig. 1. Seq. ***479***, graphs or reflexive symmetric relations.

A *digraph*, or directed graph, is a graph with arrows on the edges (Fig. 2, seq. ***1229***). Figure 3 shows seq. ***1069***, digraphs of functions, i.e., digraphs with exactly one arrow directed out of each node.

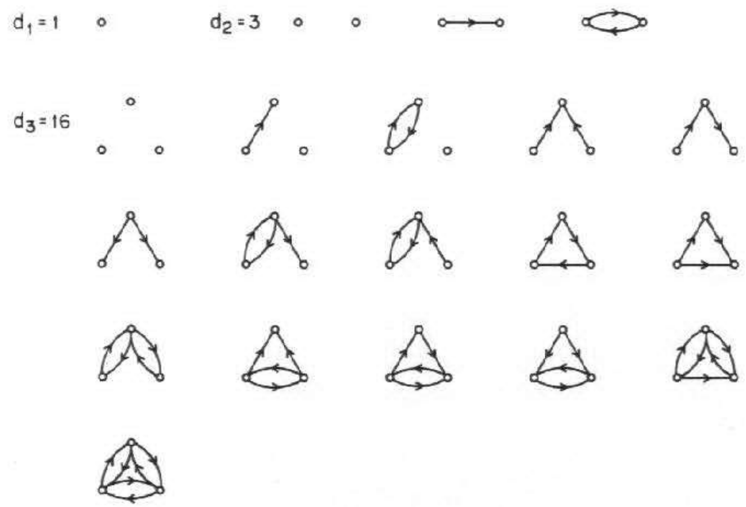

Fig. 2. Seq. *1229*, digraphs or reflexive relations.

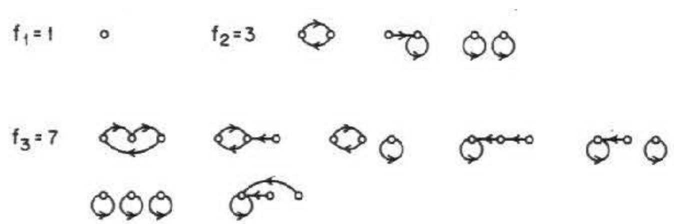

Fig. 3. Seq. *1069*, functional digraphs.

A *tree* is a connected graph containing not closed paths (Fig. 4, seq. *99*). A *rooted* tree is a tree with a distinguished node called Eve, or the oot. Figure 5 illustrates seq. ***454***, the number of rooted trees with n odes. The generating function (gf) of this sequence is

$$r(x) = x + x^2 + 2x^3 + 4x^4 + 9x^5 + \cdots$$

nd satisfies

$$r(x) = x \exp[r(x) + \tfrac{1}{2}r(x^2) + \tfrac{1}{3}r(x^3) + \cdots].$$

'he generating function for trees,

$$t(x) = x + x^2 + x^3 + 2x^4 + 3x^5 + 6x^6 + \cdots,$$

; then given by

$$t(x) = r(x) - \tfrac{1}{2}r^2(x) + \tfrac{1}{2}r(x^2).$$

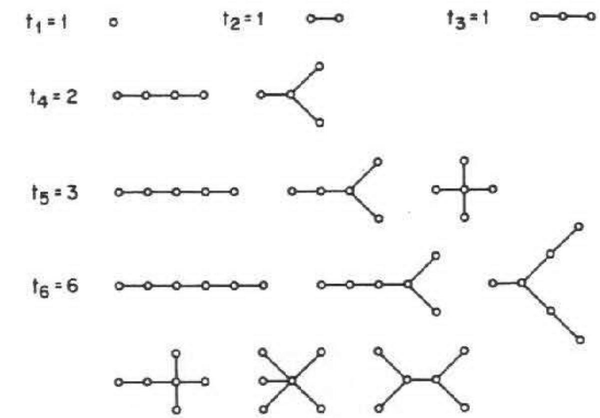

Fig. 4. Seq. *299*, trees.

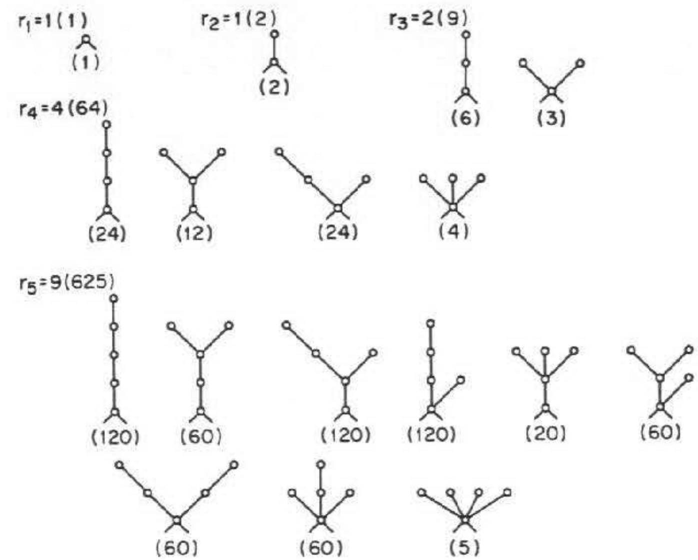

Fig. 5. Seq. *454*, rooted trees. (The numbers in parentheses give seq. *771*, labeled rooted trees.)

Any of these graphs may be *labeled* by (if there are n nodes) attaching the numbers from 1 to n to the nodes. For example in Fig. 5, the numbers in parentheses give the number of ways of labeling each tree, and then the total number of labeled rooted trees with n nodes is n^{n-1}, seq. ***771***. Usually when graphs are mentioned in the main table they are unlabeled unless stated otherwise.

The degree of a node is the number of edges meeting it. Figure 6 shows :q. ***118***, series-reduced trees, or trees without nodes of degree 2.

For further information about the preceding sequences and for the ıumeration of other kinds of graphs, see Riordan [R1] and Harary [HA5].

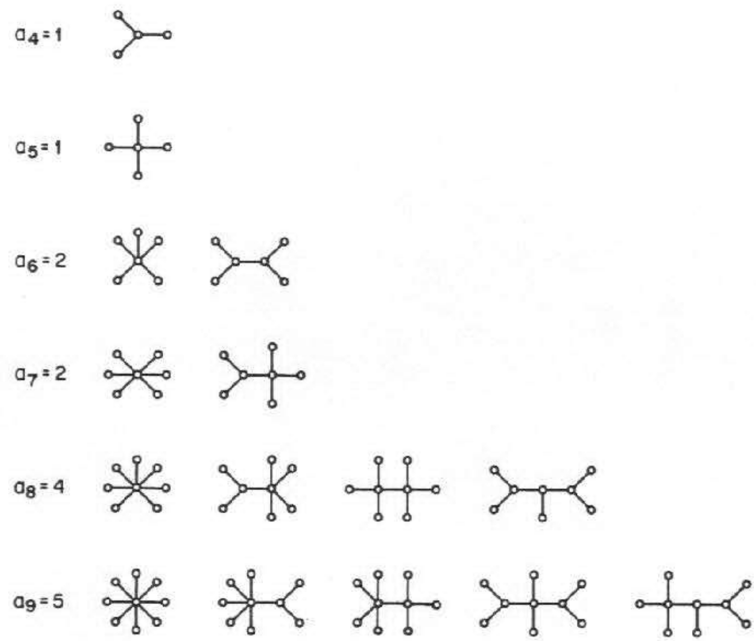

Fig. 6. Seq. ***118***, series-reduced trees.

3.2 RELATIONS

A *relation* R on a set S is any subset of $S \times S$, and xRy means (x, y) R or "x is related to y." A relation is *reflexive* if xRx for all x in S, *symıetric* if $xRy \Rightarrow yRx$, *antisymmetric* if xRy and $yRx \Rightarrow x = y$, and *transive* if xRy and $yRz \Rightarrow xRz$.

The most important types of relations are:

(1) unrestricted, or digraphs with loops of length 1 allowed (seq. ***784***: 10, 104, 3044, 291968, . . .);

(2) symmetric, or graphs with loops of length 1 allowed (seq. ***646***: 6, 20, 90, 544, 5096, 79264, . . .);

(3) reflexive, or digraphs (Fig. 2, seq. ***1229*** again);

(4) reflexive symmetric, or graphs (Fig. 1, seq. ***479*** again);

(5) reflexive transitive, or topologies (Fig. 7, seq. ***1133***: 1, 3, 9, 33, 139, 718, 4535, ?. For the connection between digraphs and topologies, see Birkhoff [B11 117]);

(6) reflexive symmetric transitive, or partitions (Fig. 20, p. 24, seq. ***244***);

(7) reflexive antisymmetric transitive, or partially ordered sets (Fig. 8, seq. ***588***: 1, 2, 5, 16, 63, 318, 2045, ?).

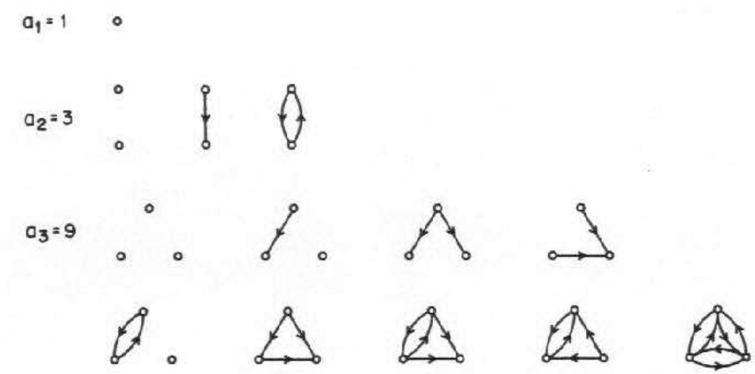

Fig. 7. Seq. ***1133***, topologies.

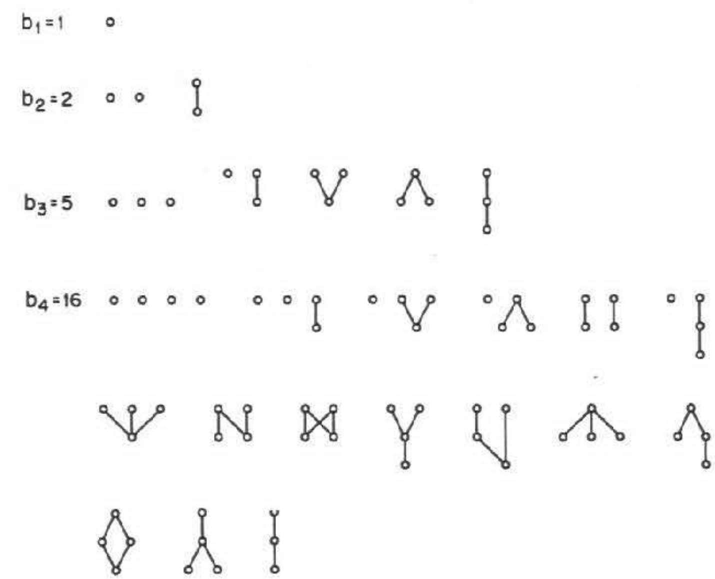

Fig. 8. Seq. ***588***, partially ordered sets.

This assumes that the graphs are unlabeled, i.e., that the elements of ıe set S are indistinguishable. If the elements of S are labeled 1 through , the corresponding numbers are:

(1) 2^{n^2};
(2) $2^{n(n+1)/2}$;
(3) $2^{n(n-1)}$;
(4) $2^{\binom{n}{2}}$

hese four [(1)–(4)] are not in the table, but the sequences of their exonents are);

(5) seq. ***1476***: 1, 4, 29, 355, 6942, 209527, 9535241, ?;
(6) seq. ***585***: the Bell numbers or the number of equivalence relations n a set of n objects (see Fig. 22, p. 25);
(7) seq. ***1244***: 1, 3, 19, 219, 4231, 130023, 6129859, ?.

3.3 GEOMETRIES

The numbers of topologies were shown in Fig. 7; the following are also asic geometrical sequences:

A *linear space* is a system of (abstract) points and lines such that every vo points lie on a unique line, and every line contains at least two points. *geometry* is a system of points, lines, planes, . . . with an analogous efinition. Figure 9 shows seq. ***462***: 1, 1, 2, 4, 9, 26, 101, 950, ?, the umber of geometries with n points. (See Crapo and Rota [JM2 49 127 0]. The * denotes 5 points in general position in 4-dimensional space.) 'he planar figures in Fig. 9 form seq. ***271***: 1, 1, 2, 3, 5, 10, 24, 69, 384, ?, ıe number of linear spaces (Doyen [BSM 19 424 67]).

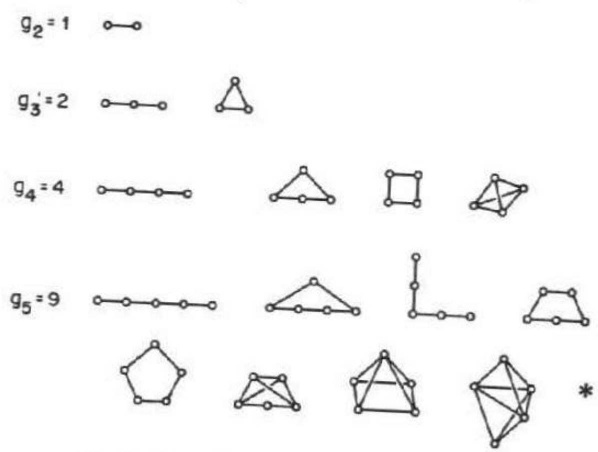

Fig. 9. Seq. ***462***, geometries (for * see text).

3.4 COMBINATIONS AND FIGURATE NUMBERS

The most basic combinatorial number is the *binomial coefficient*

$$\binom{n}{r} = \frac{n(n-1)(n-2)\cdots(n-r+1)}{1\cdot 2\cdot 3\cdots r} = \frac{n!}{r!(n-r)!},$$

which is the number of selections, or combinations, of n unlike things taken r at a time, has gf

$$(1+x)^n = \sum_{r=0}^{n} \binom{n}{r} x^r,$$

and is the $(r+1)$th term in the $(n+1)$th row of Pascal's triangle

1
1 1
1 2 1
1 3 3 1
1 4 6 4 1
1 5 10 10 5 1
1 6 15 20 15 6 1
⋮

These are also called *figurate* numbers since they are the numbers of points in certain figures. For example, $\binom{n}{2}$ and $\binom{n}{3}$ are the *triangular* and *tetrahedral* numbers (Fig. 10, seqs. ***1002***, ***1363***).

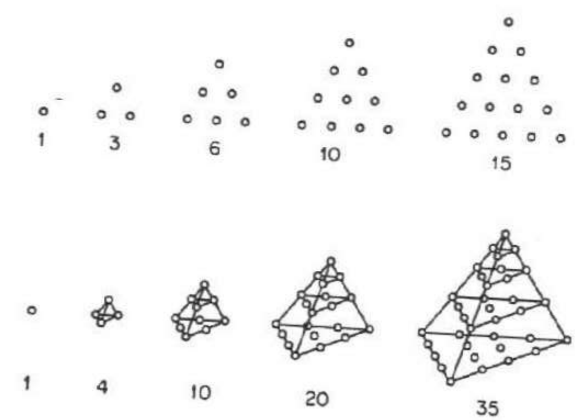

Fig. 10. Seqs. ***1002*** and ***1363***, the triangular and tetrahedral numbers.

Other examples of figurate numbers are the *polygonal* numbers $P(r, s) = \frac{1}{2}r(rs - s + 2)$. Figure 11 shows seq. ***1350***, the *square* numbers $P(r, 2) = r^2$; and seq. ***1562***, the *pentagonal* numbers $P(r, 3) = \frac{1}{2}r(3r - 1)$.

Many other figurate numbers, including cubes, fourth powers, etc., will be found in the table. For further pictures see Hogben [HO3].

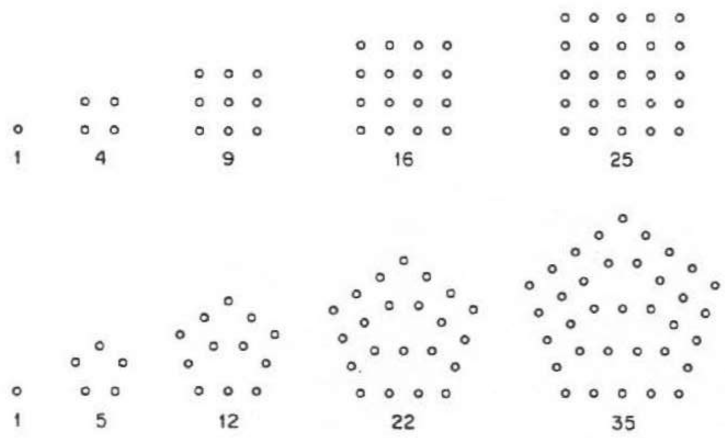

Fig. 11. Seqs. ***1350*** and ***1562***, the square and pentagonal numbers.

3.5 CATALAN NUMBERS AND DISSECTIONS

Next to the figurate numbers, the Catalan numbers are the most frequently occurring combinatorial numbers. (Gould [GO4] lists over 240 references.) They are defined by

$$c_n = \frac{1}{n+1}\binom{2n}{n},$$

and form seq. ***557***: 1, 2, 5, 14, 42, 132, 429, 1430, 4862, 16796, ... A gf is

$$1 + x + 2x^2 + 5x^3 + \cdots = (2x)^{-1}[1 - (1 - 4x)^{1/2}].$$

Some of the interpretations of c_n are:

(1) The number of ways of dissecting a convex polygon of $n + 2$ sides into n triangles by drawing nonintersecting diagonals (Fig. 12a).

(2) The number of ways of completely parenthesizing a product of $n + 1$ letters (so that there are two factors inside each set of parentheses). The examples for $n = 1, 2, 3$ (arranged to show the correspondence with the dissections of Fig. 12a) are:

$n = 1$ (ab); $n = 2$ $a(bc)$, $(ab)c$;
$n = 3$ $(ab)(cd)$, $a((bc)d)$, $((ab)c)d$, $a(b(cd))$, $(a(bc))d$.

(3) The number of bifurcated rooted planar trees with $n + 1$ endpoints. (A planar tree is one which has been drawn on a plane, and bifurcated means that each edge splits in two at each node. See Fig. 12b. The trees are drawn to show the correspondence with the dissections and the parentheses.)

(4) In an election with two candidates A and B, each receiving n votes, c_n is the number of ways the votes can come in so that A is never behind B (Feller [FE1 1 71] and Comtet [CO1 1 94]).

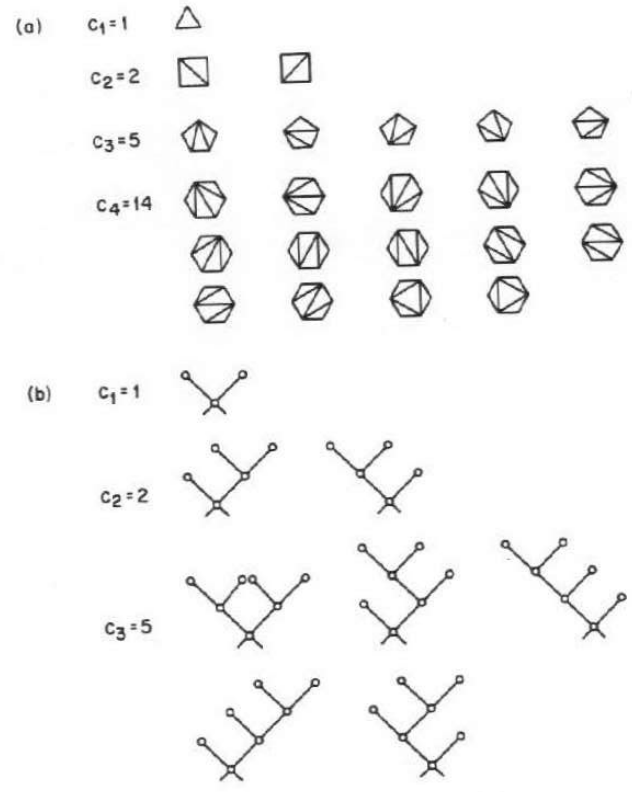

Fig. 12. Seq. ***577***, the Catalan numbers.

Figure 13 illustrates seq. ***942***, the number of different dissections of a polygon when two dissections are considered to be the same if a rotation or reflection sends one into the other.

Figure 14 illustrates seq. ***391***, giving $\frac{1}{2}n(n + 1) + 1$, the maximum number of pieces obtained by slicing a pancake with n slices. The numbers of n-sided polygons in the nth diagram of Fig. 14 form seq. ***1181***: 0, 0, 1, 3, 12, 70, 465, 3507, 30016, . . . (Robinson [AMM 58 462 51]). Seq. ***491***: 2, 4, 8, 15, 26, 42, 64, 93, 130, 176, . . . gives $(n+2)(n+3)/6$, the maximum number of pieces obtained with n slices of a cake.

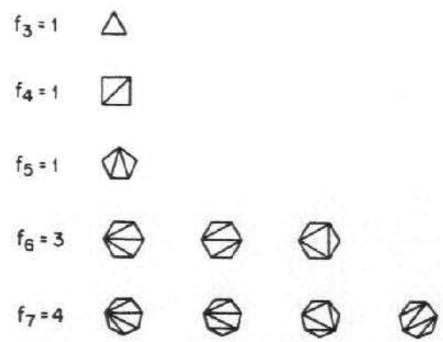

Fig. 13. Seq. ***942***, dissections of a polygon.

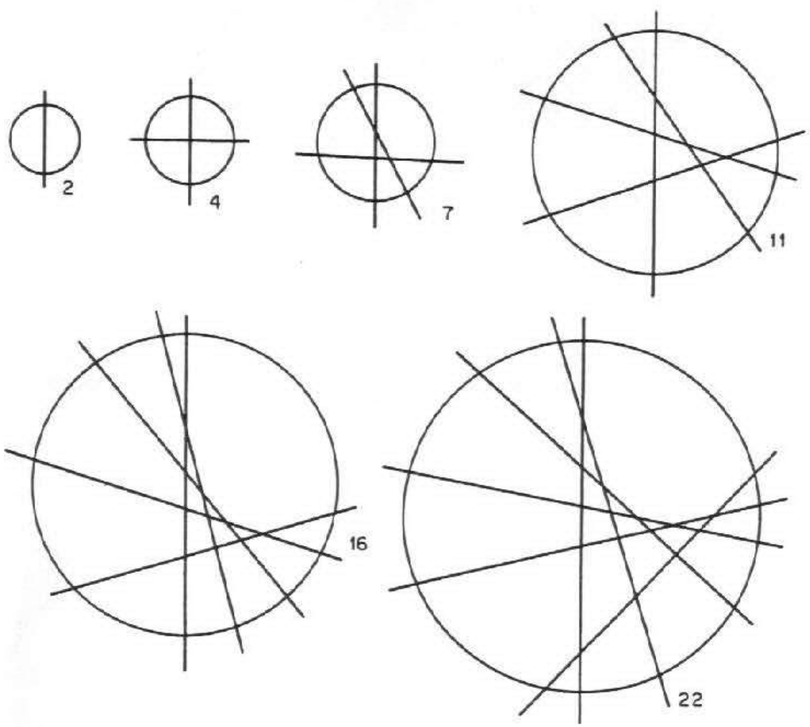

Fig. 14. Seq. ***391***, slicing a pancake.

3.6 NECKLACES AND IRREDUCIBLE POLYNOMIALS

Figure 15 illustrates seq. ***203***, T_n, the number of different necklaces that can be made from beads of two colors, when the necklaces can be rotated but not turned over. This is also the number of irreducible binary polynomials whose degree divides n, an important sequence in digital circuitry; and has the formula $T_n = \Sigma\, \phi(d) 2^{n/d}$, where $\phi(d)$ is the Euler totient function (seq. ***111***, Section 3.14) and the sum is over all divisors d of n. (See Berlekamp [BE2 70] and Golomb [CMA 1 358 69].) If turning over is allowed, the number of different necklaces is given by seq. ***202***: 2, 3, 4, 6, 8, 13, 18, 30, 46, 78, ... (See Gilbert and Riordan [IJM 5 657 61].)

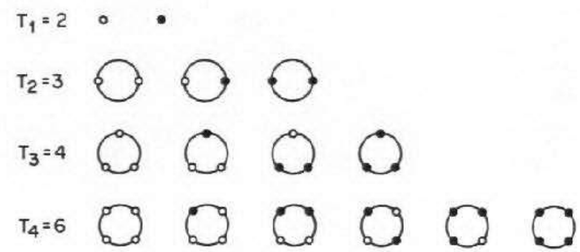

Fig. 15. Seq. ***203***, necklaces.

3.7 KNOTS

Figure 16 shows seq. ***322***: 0, 0, 1, 1, 2, 3, 7, 18, 41, 123, 367, ?, the number of knots with n crossings, in which the crossings alternate. (See Tait [TA1 1 334] and Conway [JL2 343].)

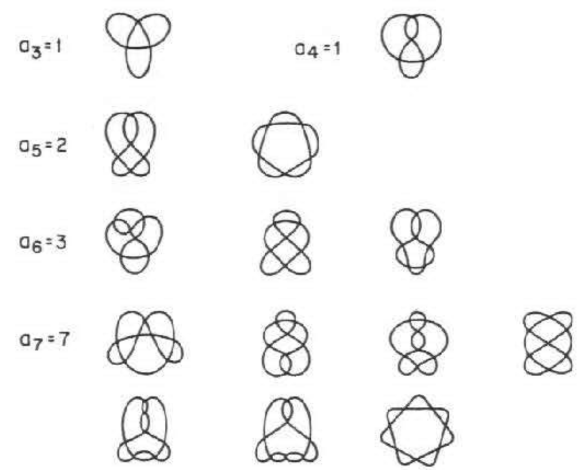

Fig. 16. Seq. ***322***, knots.

3.8 STAMPS

Figure 17 shows seq. *576*: 1, 1, 2, 5, 14, 39, 120, 358, 1176, 3527, . . . (six more terms are known), the number of ways of folding a strip of stamps.

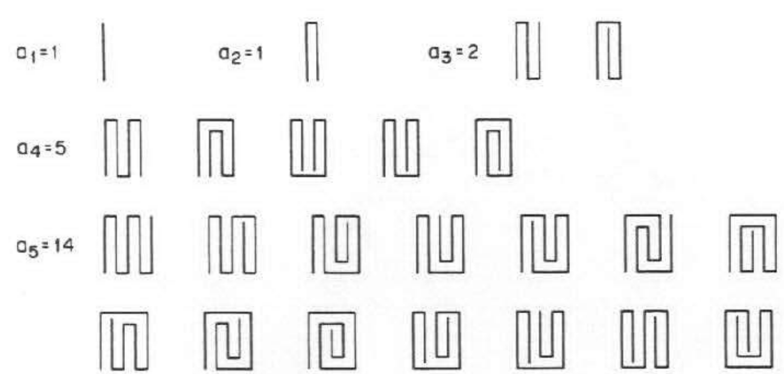

Fig. 17. Seq. *576*, folding a strip of stamps.

3.9 POLYOMINOES

A *polyomino* with p squares is a connected set of p squares from a chessboard pattern. Polyominoes are *free* if they can be rotated and turned over (Fig. 18), and *fixed* otherwise. Unless otherwise stated, all polyominoes are free. Polyominoes may also be formed from triangles, rectangles, cubes (Fig. 19), etc. In no case is a formula known for the general term. (See Golomb [GO2].)

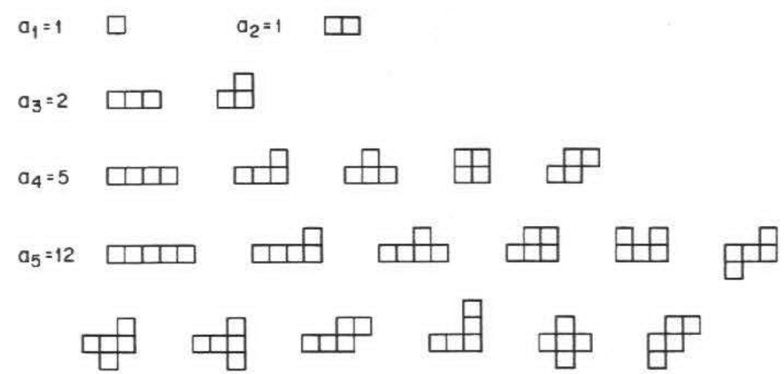

Fig. 18. Seq. *561*, square polyominoes.

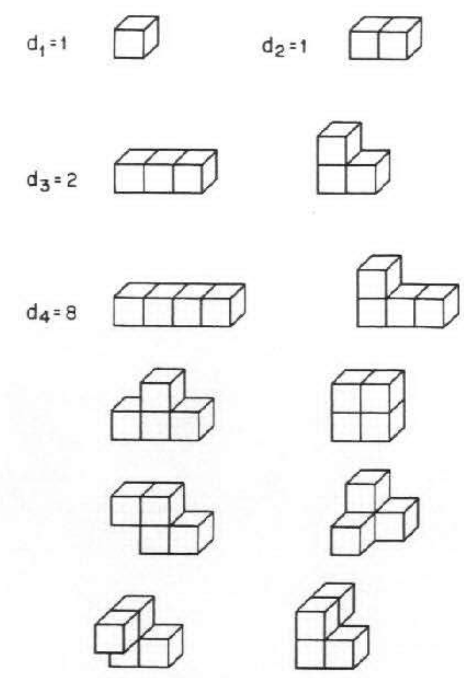

Fig. 19. Seq. *731*, polyominoes made from cubes.

3.10 BOOLEAN FUNCTIONS

A Boolean (or switching) function is a function $f(x_1, \ldots, x_n)$, where each variable x_i is 0 or 1, and f takes on the values 0 or 1.

These arise in the design of logical circuits, when the names of the variables do not matter. So it is natural to say that two such functions are equivalent if they differ only in the names of the variables (so that $x_1 + x_2x_3$ is equivalent to $x_2 + x_1x_3$), and to ask for the number of inequivalent functions. The answers to this (which is seq. ***1405***: 4, 12, 80, 3984, . . .) and to many similar questions (allowing complementation of the variables, etc.) are given by the Pólya counting theory (Section 3.11).

Two generalizations that will be found in the table are (i) Post functions, which are functions $f(x_1, \ldots, x_n)$, where each x_i and f can take any value from 0 to $m - 1$; and (ii) switching networks, which are n-input, k-output networks such that each of the outputs is a Boolean function of the n inputs. For details see Harrison [HA2, MU3 85].

3.11 PÓLYA COUNTING THEORY

A large number of counting problems involving graphs, necklaces, Boolean functions, and patterns of various kinds have been solved by the theorems of Redfield, Pólya, and De Bruijn. (See Riordan [R1 131], De Bruijn [BE6 144], Harrison [HA2 127, MU3 85], and Harary [HA5 178].)

3.12 PARTITIONS

The following are the most important sequences of partitions.

The main such sequence is number ***244***: 1, 2, 3, 5, 7, 11, . . . , giving the number of partitions of n into integer parts (Fig. 20). A gf is

$$1 + x + 2x^2 + 3x^3 + 5x^4 + \cdots = \prod_{i=1}^{\infty} (1 - x^i)^{-1}.$$

(See Gupta [RS2] and David *et al.* [DKB 273].)

Those partitions of n in which all parts are distinct form seq. ***100***: 1, 1, 2, 2, 3, 4, 5, . . . with gf

$$1 + x + x^2 + 2x^3 + 2x^4 + \cdots = \prod_{i=1}^{\infty} (1 + x^i).$$

The partitions of the even numbers into parts which are powers of two form the binary partition function $b(n)$, seq. ***378***: 1, 2, 4, 6, 10, 14, 20, 26, 36, 46, . . . , with recurrence $b(n) = b(n-1) + b([\frac{1}{2}n])$.

$p(1) = 1$	1
$p(2) = 2$	$2, 1^2$
$p(3) = 3$	$3, 21, 1^3$
$p(4) = 5$	$4, 31, 2^2, 21^2, 1^4$
$p(5) = 7$	$5, 41, 32, 31^2, 2^21, 21^3, 1^5$
$p(6) = 11$	$6, 51, 42, 41^2, 3^2, 321, 31^3, 2^3, 2^21^2, 21^4, 1^6$
$p(7) = 15$	$7, 61, 52, 51^2, 43, 421, 41^3, 3^21, 32^2, 321^2, 31^4, 2^31, 2^21^3, 21^5, 1^7$

Fig. 20. Seq. ***244***, the number of partitions of n.

Figure 21 illustrates the number of planar partitions of n, seq. ***1016***, with gf

$$1 + x + 3x^2 + 6x^3 + \cdots = \prod_{i=1}^{\infty} (1 - x^i)^{-i}.$$

Figure 22 shows $S(n, k)$, the *Stirling numbers of the second kind*, or the number of partitions of a set of n labeled objects into k parts.

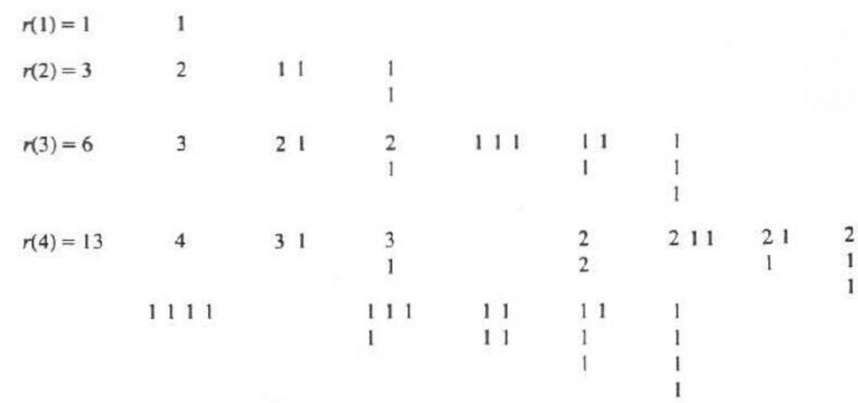

Fig. 21. Seq. ***1016***, planar partitions.

n \ k	1	2	3	4	Total
1	1				1
2	12	1, 2			2
3	123	1, 23 2, 13 3, 12	1, 2, 3		5
4	1234	1, 234 2, 134 3, 124 4, 123 12, 34 13, 24 14, 23	1, 2, 34 1, 3, 24 1, 4, 23 2, 3, 14 2, 4, 13 3, 4, 12	1, 2, 3, 4	15

Fig. 22. $S(n, k)$, the Stirling numbers of the second kind, and seq. ***585***, the Bell numbers.

The numbers continue:

							row sums $B(n)$
1							1
1	1						2
1	3	1					5
1	7	6	1				15
1	15	25	10	1			52
1	31	90	65	15	1		203
1	63	301	350	140	21	1	877
			⋮				⋮

A gf for $S(n, k)$ is

$$x^n = \sum_{k=0}^{n} S(n, k)\, x(x-1) \cdots (x-k+1).$$

Both the columns and diagonals of this array will be found in the main table.

The row sums are the *Bell numbers* $B(n)$, seq. ***585***. $B(n)$ is also the number of equivalence relations on a set of n objects (Section 3.2) and has gf

$$1 + x + 2\frac{x^2}{2!} + 5\frac{x^3}{3!} + \cdots = e^{e^x - 1}.$$

See Abramowitz and Stegun [AS1 835], David *et al.* [DKB 223], and Comtet [CO1 2 38].)

3.13 PERMUTATIONS

A *permutation* of n objects is any rearrangement of them, and is specified either by a table:

1	2	3	4	5
3	5	4	1	2

or by a product of cycles: (134)(25), both of which mean replace 1 by 3, 3 by 4, 4 by 1, 2 by 5, and 5 by 2.

Figure 23 shows $s(n, k)$, the *Stirling numbers of the first kind*, or the numbers of permutations of n objects containing k cycles. The numbers continue:

							row sums $n!$
1							1
1	1						2
2	3	1					6
6	11	6	1				24
24	50	35	10	1			120
120	274	225	85	15	1		720
720	1764	1624	735	175	21	1	5040
			⋮				⋮

A gf for $s(n, k)$ is

$$x(x-1) \cdots (x-n+1) = \sum_{k=0}^{n} (-1)^{n-k} s(n, k) x^k.$$

Both the columns and diagonals of this array will be found in the main table. The row sums are the *factorial* numbers $n!$, seq. ***659***, the total number of permutations of n objects. References are as given above for the Stirling numbers of the second kind.

Factorial n is the product $1 \cdot 2 \cdot 3 \cdots n$ of the first n numbers. The products of the first n even numbers, $(2n)!! = 2 \cdot 4 \cdot 6 \cdots (2n) = 2^n \cdot n!$, seq. ***742***: 2, 8, 48, 384, 3840, 46080, . . . , and of the first n odd numbers, $(2n-1)!! = 1 \cdot 3 \cdot 5 \cdots (2n-1) = (2n)!/(2^n \cdot n!)$, seq. ***1217***: 1, 3, 15, 105, 945, 10395, . . . , are called *double factorials*.

n \ k	1	2	3	4	Total
1	(1)				1
2	(12)	(1)(2)			2
3	(123) (132)	(1)(23) (2)(13) (3)(12)	(1)(2)(3)		6
4	(1234) (1243) (1324) (1342) (1423) (1432)	(1)(234) (1)(243) (2)(134) (2)(143) (3)(124) (3)(142) (4)(123) (4)(132) (12)(34) (13)(24) (14)(23)	(1)(2)(34) (1)(3)(24) (1)(4)(23) (2)(3)(14) (2)(4)(13) (3)(4)(12)	(1)(2)(3)(4)	24

Fig. 23. $s(n, k)$, the Stirling numbers of the first kind; and seq. ***659***, the factorial numbers.

$D_2 = 1$	1 2 2 1		
$D_3 = 2$	1 2 3 2 3 1	1 2 3 3 1 2	
$D_4 = 9$	1 2 3 4 2 1 4 3	1 2 3 4 2 3 4 1	1 2 3 4 2 4 1 3
	1 2 3 4 3 1 4 2	1 2 3 4 3 4 1 2	1 2 3 4 3 4 2 1
	1 2 3 4 4 1 2 3	1 2 3 4 4 3 1 2	1 2 3 4 4 3 2 1

Fig. 24. Seq. ***766***, derangements.

Figure 24 shows D_n, the number of *derangements* of n objects, or the permutations in which every object is moved from its original position (seq. ***766***). These are also called subfactorial or *rencontres* numbers, and have the recurrence $D_n = nD_{n-1} + (-1)^n$. (See Riordan [R1 57].)

Figure 25 illustrates seq. ***587***, the *Euler numbers* E_n, or the number of ɜrmutations of n objects which first rise and then alternately fall and se. (Only the second rows of the permutations are shown.)

The even numbered Euler numbers form seq. ***1667***: 1, 5, 61, 1385,)521, . . . , and have gf

$$1 + 1\frac{x^2}{2!} + 5\frac{x^4}{4!} + 61\frac{x^6}{6!} + \cdots = \sec x.$$

)ften these are called the Euler numbers instead of seq. ***587***.)

The odd numbered Euler numbers form seq. ***829***: 1, 2, 16, 272, 7936, 53792, . . . , and are called the *tangent numbers* $T_n = E_{2n-1}$. They have

$$x + 2\frac{x^3}{3!} + 16\frac{x^5}{5!} + \cdots = \tan x.$$

$E_1 = 1$	1				
$E_2 = 1$	1 2				
$E_3 = 2$	1 3 2	2 3 1			
$E_4 = 5$	1 3 2 4	1 4 2 3	2 3 1 4	2 4 1 3	3 4 1 2
$E_5 = 16$	1 3 2 5 4	1 4 2 5 3	1 4 3 5 2	1 5 2 4 3	
	1 5 3 4 2	2 3 1 5 4	2 4 1 5 3	2 4 3 5 1	
	2 5 1 4 3	2 5 3 4 1	3 4 1 5 2	3 4 2 5 1	
	3 5 1 4 2	3 5 2 4 1	4 5 1 3 2	4 5 2 3 1	

Fig. 25. Seq. *587*, the Euler numbers.

The *Bernoulli numbers* B_n are defined by

$$B_n = \frac{2nE_{2n-1}}{2^{2n}(2^{2n}-1)},$$

ıd form the sequence

$$\frac{1}{6}, \frac{1}{30}, \frac{1}{42}, \frac{1}{30}, \frac{5}{66}, \frac{691}{2730}, \frac{7}{6}, \frac{3617}{510}, \ldots$$

th gf

$$1 - \frac{x}{2} + \frac{1}{6}\frac{x^2}{2!} - \frac{1}{30}\frac{x^4}{4!} + \frac{1}{42}\frac{x^6}{6!} - \cdots = \frac{x}{e^x - 1}.$$

he numerators and denominators form seqs. ***1677*** and ***1746***.

Finally the *Genocchi numbers* are defined by $G_n = 2^{2-2n}\, n\, E_{2n-1}$, and form seq. ***1233***: 1, 1, 3, 17, 155, 2073, 38227, . . . , with gf

$$1\frac{x}{2!} + 1\frac{x^3}{4!} + 3\frac{x^5}{6!} + 17\frac{x^7}{8!} + \cdots = \tan\frac{1}{2}x.$$

The Euler, tangent, Bernoulli, and Genocchi numbers arise in all branches of mathematics. For applications and properties see Jordan [JO2], David and Barton [DB1], Comtet [CO1] and Gould [AMM 79 44 72]; for tables see Fletcher *et al.* [FMR 1 65] and Knuth and Buckholtz [MTAC 21 663 67].

3.14 SEQUENCES FROM NUMBER THEORY

The table contains many number-theoretic sequences, of which the following are typical:

(1) The prime numbers, lucky numbers, and other sequences generated by sieves (seqs. ***241***, ***377***, ***1035***, ***1048***);

(2) the Euler totient function $\phi(n)$: the number of integers not exceeding and relatively prime to n (seq. ***111***);

(3) from the Goldbach conjecture: the number of ways of writing $2n$ as a sum of two primes (various sequences—see index);

(4) quadratic partitions of primes: a prime of the form $4n + 1$ has a unique representation as $a^2 + b^2$ with $a \geqslant b$. Sequences ***169*** and ***33*** give a and b;

(5) the number of integers less than or equal to 2^n expressible in the form $u^2 + v^2$, where u and v are integers (seq. ***265***);

(6) Mersenne primes: the numbers n such that $2^n - 1$ is prime (seq. ***248***);

(7) from Euler's proof that there are an infinity of primes: let $p_1 = 2$, $p_2, \ldots, p_n$ be primes, and define p_{n+1} to be the smallest (largest) prime factor of $p_1 p_2 \cdots p_n + 1$ (seqs. ***329***, ***330***);

(8) Beatty sequences: if α, β are positive irrational numbers such that $(1/\alpha) + (1/\beta) = 1$, then the *Beatty sequences*

$$[\alpha], [2\alpha], [3\alpha], \ldots \quad \text{and} \quad [\beta], [2\beta], [3\beta], \ldots$$

together contain all the positive integers without repetition, where $[x]$ denotes the greatest integer less than or equal to x. (See Honsberger [HO2].) For example, $\alpha = \frac{1}{2}(1 + \sqrt{5}) = 1.61803\ldots$ gives seqs. ***917***: 1, 3, 4, 6, 8, 9, . . . and ***509***: 2, 5, 7, 10, 13, 15, ...

The following test for Beatty sequences is due to R. L. Graham. If $a_1, a_2, \ldots$ is a Beatty sequence, then the values of $a_1, \ldots, a_{n-1}$ determine to within 1. Look at the sums $a_1 + a_{n-1}, a_2 + a_{n-2}, \ldots, a_{n-1} + a_1$. all these sums have the same value, V say, then a_n must equal V or $+ 1$; but if they take on the two values V and $V + 1$, and no others, then must equal $V + 1$. If anything else happens, it is not a Beatty sequence. r example, in seq. ***917***, $a_1 + a_1 = 2$ so a_2 must be 2 or 3 (it is 3); $a_1 + a_2$ 4 so a_3 must be 4 or 5 (it is 4); $a_1 + a_3 = 5$ and $a_2 + a_2 = 6$, so a_4 must 6 (it is); and so on.

For further information about number-theoretic sequences see the mprehensive works of Dickson [DI2] and Lehmer [LE1].

3.15 PUZZLE SEQUENCES

This section describes some sequences with simple yet unexpected nerating principles. They have all been given as puzzles at one time or other. Of course all of the sequences given in Chapters II and III make od puzzles.

(1) Sequences related to well-known constants (e.g., seq. ***1291***: 1, 4, 4, 2, 1, 3, 5, 6, 2, 3, . . . , the decimal expansion of $\sqrt{2}$) or to other com- on sequences (seq. ***2127***: 1, 15, 29, 12, 26, 12, 26, 9, . . . is related to the lendar—guess!). See also seqs. ***684, 880, 1679, 1812***, etc.

(2) Sequences depending on the binary expansions of numbers (e.g., q. ***41***: 1, 2, 1, 2, 2, 3, 1, 2, 2, . . . gives the number of 1's in the binary pansion of $n + 1$; see also seqs. ***360, 388***).

(3) Sequences depending on the English words or Arabic numerals ed to describe them (e.g., seq. ***2218***: 1, 21, 21000, 101, 121, 1101, . . . , e smallest number requiring n words in English; see also seqs. ***1818, 97***).

(4) The terms not in some well-known sequence (e.g., seq. ***1319***: 4, 7, 9, 10, 11, 12, 14, 15, . . . , the non-Fibonacci numbers).

(5) Sequences obtained by *bisecting* (i.e., taking every other term of) ell-known sequences (e.g., seq. ***1067***: 1, 3, 7, 18, 47, 123, 322, . . . , a section of seq. ***924***, the Lucas numbers; see also seqs. ***569, 1101***).

(6) Sequences obtained by alternating the terms of two sequences eq. ***889***: 3, 2, 1, 7, 4, 1, 1, 8, 5, 2, 9, . . . , mixing π and e, is the only ample given).

The following pleasing puzzles are not in the table because they are iite or are not integers.

(7) $\frac{1}{4}, \frac{1}{2}$, 1, 3, 6, 12, 24, 30, 120, 240, 1200, 2400, English money in 50.

(8) 3, 8, 8, 4, 89, 75, 30, 28, ?, planetary diameters in thousands of atute miles.

(9) 8, 5, 4, 9, 1, 7, 6, 3, 2, 0; or 8, 8000000000, . . . , 18, 18000000000, . . . , 18000000, . . . , 18000, . . . , 80, . . . , 88, . . . , 85, . . . , 84, . . . , 11, . . . , 15, . . . , 5, . . . , 4, . . . , the numbers arranged in alphabetical order (in English).

(10) 12, 13, 14, 15, 20, 22, 30, 110, 1100, the number 12 written to the bases 10, 9, 8, . . . , 2.

(11) 14, 18, 23, 28, 34, 42, 50, 59, 66, 72, 79, 86, 96, 103, 110, 116, 125, 137, 145, 157, 168, 181, 191, 207, 215, 225, 231, 238, 242, the local stops on the New York IRT subway.

(12) 1714, 1727, 1760, 1820, 1910, 1936, dates of the accessions of the Georges to the English throne.

(13) 1732, 1735, 1743, 1751, 1758, 1767, 1767, 1782, 1773, 1790, 1795, 1784, 1800, 1804, 1791, 1809, 1808, 1822, 1822, 1831, 1830, 1837, 1833, 1837, 1843, 1858, 1857, 1856, 1865, 1872, 1874, 1882, 1884, 1890, 1917, 1908, 1913, dates of birth of presidents of the U.S.A.

(14) The integers 1, 2, 3, . . . drawn next to a mirror. (See Fig. 26.)

(15) O, T, T, F, F, S, S, E, N, T, E, T, T, F, F, S, S, E, N, T, T, T, T, . . . , the initial letters of the English names for the numbers.

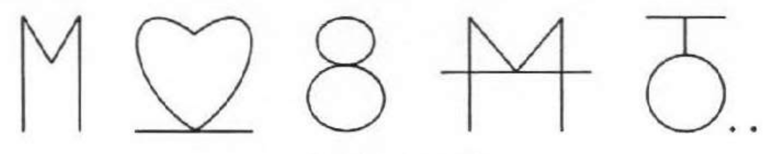

Fig. 26. A puzzle.

3.16 SEQUENCES FROM LATTICE STUDIES IN PHYSICS

In the last twenty years physicists have studied a number of basic combinatorial problems related to crystal lattices. Typical problems are to find the number of self-avoiding paths of length n on a given lattice, or the number of ways a particular graph can be drawn on the lattice. A number of such sequences will be found in the main table. For further information see Montroll [BE6 96], Sykes *et al.* [JMP 7 1557 66], Kasteleyn [HA1 43], Percus [PE3], and Domb [ACP 15 229 69].

THE MAIN TABLE OF SEQUENCES

SEQUENCES BEGINNING 1, 2, 0 AND 1, 2, 1

1 1, 2, 0, 0, 1, 1, 2, 0, 0, 2, 0, 0, 1, 2, 1, 0, 2, 0, 0, 0, 0, 3, 2, 0, 0, 2, 0, 0, 1, 0, 2, 0, 1, 2, 0, 0, 2, 2, 0, 0, 0, 2, 0, 0, 0, 1, 3, 0, 2, 2, 0, 0, 0, 0, 2, 0, 0, 2, 0, 0, 1, 4, 0, 0, 2, 0, 0, 0, 1
RELATED TO THE DIVISORS OF N. REF QJM 20 164 1884.

2 1, 2, 0, 1, 0, 0, 1, 2, 0, 0, 1, 0, 0, 2, 0, 2, 0, 0, 0, 1, 0, 1, 2, 0, 0, 2, 0, 0, 0, 0, 1, 2, 0, 2, 0, 0, 0, 2, 0, 0, 0, 0, 1, 3, 0, 0, 2, 0, 0, 0, 0, 2, 0, 0, 0, 2, 0, 2, 1, 0, 0, 2, 0, 0, 0, 0, 0, 2, 0
RELATED TO THE DIVISORS OF N. REF MES 31 67 01. LE1 8.

3 1, 2, 0, 1, 1, 1, 0, 0, 3, 2, 1, 1, 2, 1, 2, 1, 2, 1, 0, 2, 3, 3, 1, 0, 2, 4, 1, 2, 4, 1, 1, 3, 5, 4, 1, 2, 3, 4, 4, 3, 5, 3, 1, 4, 8, 6, 1, 2, 7, 6, 4, 8, 6, 3, 4, 6, 10, 8, 4, 5, 6, 10, 10, 7, 10, 7, 4
RELATED TO PARTITIONS INTO PRIMES. REF PNISI 21 187 55.

4 1, 2, 0, 2, 1, 1, 2, 1, 2, 2, 2, 2, 3, 2, 4, 3, 4, 4, 4, 5, 5, 5, 6, 5, 6, 7, 6, 9, 7, 9, 9, 9, 11, 11, 11, 13, 12, 14, 15, 15, 17, 16, 18, 19, 20, 21, 23, 22, 25, 26, 27, 30, 29, 32, 32, 35
PARTITIONS INTO DISTINCT PRIMES. REF PNISI 21 186 55. PURB 107 285 57.

5 1, 2, 0, 2, 2, 4, 3, 2, 8, 1, 8, 8, 12, 11, 4, 25, 4, 24, 21, 40, 31, 16, 82, 14
FROM SYMMETRIC FUNCTIONS. REF PLMS 23 309 23.

6 1, 2, 0, 2, 3, 2, 6, 4, 9, 14, 11, 26, 29, 34, 62, 68, 99, 140, 169, 252, 322, 430, 607, 764, 1059, 1424, 1845, 2546
FROM SYMMETRIC FUNCTIONS. REF PLMS 23 315 23.

7 1, 2, 0, 3, 1, 1, 0, 3, 3, 2, 2, 4, 0, 5, 2, 2, 3, 3, 0, 1, 1, 3, 0, 2, 1, 1, 0, 4, 5, 3, 7, 4, 0, 1, 1, 2, 0, 3, 1, 1, 0, 3, 3, 2, 2, 4, 4, 5, 5, 2, 3, 3, 0, 1, 1, 3, 0, 2, 1, 1, 0, 4, 5, 3, 7, 4, 8, 1, 1
THE GAME OF DAWSONS KAYLES. REF PCPS 52 517 56.

8 1, 2, 0, 4, 9, 18, 17, 0, 24, 35, 36, 12, 40, 11, 0, 13, 56, 30, 79, 45, 39, 67, 100, 0, 133, 83, 48, 53, 104, 138, 7, 163, 100, 26, 0, 28, 116, 217, 9, 248, 104, 17, 80, 79, 8, 139
THE MINIMAL SEQUENCE. REF AT1 177.

9 1, 2, 0, 8, 24, 72, 240, 896, 3640, 15688, 70512
ENERGY FUNCTION FOR SQUARE LATTICE. REF PHA 28 926 62.

10 1, 2, 0, 9, 35, 230, 1624, 13209, 120287
LOGARITHMIC NUMBERS. REF MST 31 77 63.

11 1, 2, 0, 12, 14, 90, 192, 792, 2148, 7716, 23262, 79512, 252054
MAGNETISATION FOR CUBIC LATTICE. REF PHA 22 936 56.

12 1, 2, 1, 0, 1, 2, 3, 2, 1, 0, 1, 2, 3, 4, 3, 2, 3, 2, 1, 0, 1, 2, 3, 4, 5, 6, 5, 4, 3, 2, 3, 2, 1,
0, 1, 2, 3, 4, 5, 4, 5, 6, 5, 6, 5, 6, 7, 6, 5, 4, 3, 2, 3, 2, 3, 2, 3, 2, 1, 2, 3, 4, 3, 4, 5, 6, 7, 6, 7
LIOUVILLES FUNCTION. REF PURB 3 48 50.

13 1, 2, 1, 0, 2, 0, 1, 3, 0, 2, 2, 0, 0, 0, 1, 2, 3, 2, 0, 0, 2, 0, 2, 1, 0, 4, 0, 0, 0, 0, 1, 4, 2,
0, 3, 0, 2, 0, 0, 2, 0, 2, 2, 0, 0, 0, 2, 1, 1, 4, 0, 0, 4, 0, 0, 4, 0, 2, 0, 0, 0, 0, 1, 0, 4, 2, 2, 0, 0
RELATED TO THE DIVISORS OF N. REF MES 31 86 01. LE1 9.

14 1, 2, 1, 0, 2, 1, 0, 2, 1, 3, 2, 1, 3, 2, 4, 3, 0, 4, 3, 0, 4, 3, 0, 4, 1, 2, 3, 1, 2, 4, 1, 2, 4,
1, 2, 4, 1, 5, 4, 1, 5, 4, 1, 5, 4, 1, 0, 2, 1, 0, 2, 1, 5, 2, 1, 3, 2, 1, 3, 2, 4, 3, 2, 4, 3, 2, 4, 3, 2
GRUNDYS GAME. REF PCPS 52 525 56.

15 1, 2, 1, 0, 4, 2, 3, 1, 0, 6, 3, 2, 180, 4, 1, 0, 8, 4, 39, 2, 12, 42, 5, 1, 0, 10, 5, 24,
1820, 2, 273, 3, 4, 6, 1, 0, 12, 6, 4, 3, 320, 2, 531, 30, 24, 3588, 7, 1, 0, 14, 7, 90, 9100, 66
SOLUTIONS OF PELLIANS. REF DE1. CAY 13 430. LE1 55.

16 1, 2, 1, 1, 1, 1, 1, 1, 2, 2, 1, 2, 2, 2, 1, 1, 2, 1, 2, 2, 3, 3, 2, 3, 2, 2, 2, 1, 2, 1, 3, 3, 3,
4, 3, 3, 2, 3, 3, 1, 2, 3, 4, 4, 3, 4, 3, 4, 3, 3, 3, 3, 3, 4, 5, 5, 3, 3, 4, 4, 3, 2, 4, 3, 4, 4, 4, 6, 5
PARTITIONS INTO NOT MORE THAN 5 PENTAGONAL NUMBERS. REF LINR 1 4 46. MTAC 2 301 47.

17 1, 2, 1, 1, 1, 1, 2, 2, 1, 1, 1, 2, 1, 1, 1, 1, 2, 1, 2, 1, 1, 3, 1, 1, 1, 1, 2, 2, 1, 2, 1, 2, 1,
1, 1, 1, 2, 2, 1, 2, 2, 2, 1, 1, 1, 1, 3, 1, 1, 1, 1, 2, 1, 1, 1, 1, 2, 2, 2, 1, 1, 2, 2, 1, 1, 1, 2, 2, 1
LEONARDO LOGARITHMS. REF HM1. MTAC 23 460 69. ACA 16 109 69.

18 1, 2, 1, 1, 1, 1, 2, 2, 1, 2, 2, 1, 1, 2, 2, 3, 2, 2, 2, 2, 1, 1, 3, 3, 3, 3, 2, 2, 2, 1, 3, 4, 2,
4, 3, 3, 2, 2, 3, 4, 3, 2, 4, 2, 2, 2, 4, 5, 3, 5, 3, 5, 3, 1, 4, 5, 3, 3, 4, 3, 4, 2, 4, 6, 4, 4, 4, 5, 2
PARTITIONS INTO NOT MORE THAN 4 SQUARES. REF LINR 1 10 46. MTAC 2 301 47.

19 1, 2, 1, 1, 1, 2, 1, 2, 1, 2, 2, 1, 1, 2, 1, 2, 2, 2, 1, 2, 1, 2, 1, 2, 1, 3, 1, 1, 2, 2, 2, 2, 1,
2, 2, 2, 1, 3, 1, 2, 2, 2, 1, 2, 1, 2, 2, 2, 1, 2, 2, 2, 2, 2, 1, 3, 1, 2, 2, 1, 2, 3, 1, 2, 2, 3, 1, 2, 1
NUMBER OF DISTINCT PRIMES DIVIDING N + 4. REF AS1 844.

20 1, 2, 1, 1, 1, 3, 2, 1, 1, 2, 1, 1, 1, 5, 1, 2, 1, 2, 1, 1, 1, 3, 2, 1, 3, 2, 1, 1, 1, 7, 1, 1, 1,
4, 1, 1, 1, 3, 1, 1, 1, 2, 2, 1, 1, 5, 2, 2, 1, 2, 1, 3, 1, 3, 1, 1, 1, 2, 1, 1, 2, 11, 1, 1, 1, 2, 1, 1, 1
NUMBER OF ABELIAN GROUPS OF ORDER N + 2. REF MZT 56 21 52.

21 1, 2, 1, 1, 2, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1,
2, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 1, 2, 1, 2, 1, 2, 1, 1
A SELF-GENERATING SEQUENCE. REF MMAG 36 180 63.

22 1, 2, 1, 1, 2, 1, 2, 1, 6, 1, 2, 3, 2, 1, 1, 1, 1, 2, 8, 2, 1, 8, 2, 1, 2, 1, 3, 4, 18, 1, 2, 1, 1,
10, 3, 1, 2, 1, 1, 1, 2, 2, 1, 2, 1, 6, 1, 3, 8, 2, 10, 5, 16, 2, 1, 2, 3, 4, 3, 1, 3, 2, 2, 1, 11, 16, 1
FERMAT QUOTIENTS. REF BE4 35 666 13. KR1 1 131. LE1 10.

23 1, 2, 1, 1, 2, 1, 2, 3, 2, 1, 3, 2, 2, 3, 2, 2, 4, 2, 3, 4, 2, 3, 5, 1, 4, 5, 2, 3, 5, 1, 3, 5, 3,
3, 5, 3, 5, 7, 3, 5, 7, 4, 4, 7, 3, 3, 7, 4, 3, 9, 5, 3, 7, 5, 3, 8, 5, 4, 8, 5, 3, 7, 5, 3, 9, 4, 3, 12, 6
DECOMPOSITIONS OF 2N INTO SUM OF 2 LUCKY NUMBERS. REF MMAG 29 119 59. ST4. MTAC 19 332 65.

24 1, 2, 1, 1, 2, 1, 4, 2, 0, 1, 0, 7, 3, 8, 30, 8, 23, 2, 14, 10, 28, 2, 18, 4, 24, 8, 12, 4, 0,
28, 33, 28, 44, 40, 2, 22, 16, 18, 25, 7, 22, 12, 12, 10, 30, 8, 42, 27, 34, 32, 47, 27, 39, 25
EXPANSION OF AN INFINITE PRODUCT. REF JRAM 221 218 66.

25 1, 2, 1, 1, 2, 2, 1, 1, 0, 3, 2, 1, 2, 1, 1, 2, 2, 2, 2, 2, 1, 3, 1, 0, 1, 3, 2, 2, 2, 1, 3, 2, 0,
2, 1, 1, 4, 2, 1, 3, 2, 2, 2, 2, 1, 4, 2, 1, 1, 3, 3, 3, 3, 4, 1, 5, 3, 2, 4, 3, 2, 4, 2, 1, 2, 4, 2, 3, 1
PARTITIONS INTO A PRIME AND A SQUARE. REF AM3 47 30 43.

26 1, 2, 1, 1, 2, 2, 1, 2, 1, 2, 3, 2, 2, 1, 2, 1, 2, 2, 2, 2, 1, 3, 2, 2, 2, 2, 1, 4, 2, 1, 2, 2, 2,
1, 2, 4, 2, 2, 2, 1, 3, 2, 2, 2, 2, 2, 2, 2, 1, 2, 4, 1, 4, 2, 2, 1, 4, 2, 2, 2, 2, 2, 2, 1, 2, 3, 4, 2, 2
RELATED TO THE DIVISORS OF N. REF PLMS 15 106 1884.

27 1, 2, 1, 1, 2, 2, 1, 2, 2, 1, 3, 2, 1, 2, 3, 2, 2, 2, 1, 4, 3, 2, 2, 2, 2, 3, 3, 1, 4, 4, 2, 2, 3,
2, 3, 4, 2, 3, 3, 2, 4, 3, 2, 4, 4, 2, 4, 4, 1, 4, 5, 1, 2, 3, 4, 6, 4, 3, 2, 5, 2, 3, 3, 3, 6, 5, 2, 2, 5
PARTITIONS INTO NOT MORE THAN 3 TRIANGULAR NUMBERS. REF LINR 1 12 46. MTAC 2 301 47.

28 1, 2, 1, 2, 1, 2, 2, 0, 2, 2, 1, 0, 0, 2, 3, 2, 2, 0, 0, 2, 2, 0, 0, 2, 1, 0, 2, 2, 2, 2, 1, 2, 0,
2, 2, 2, 2, 0, 2, 0, 4, 0, 0, 0, 1, 2, 0, 0, 2, 0, 2, 2, 1, 2, 0, 2, 2, 0, 0, 2, 0, 2, 0, 2, 2, 0, 4, 0, 0
THE SQUARE OF EULERS PRODUCT. REF PLMS 21 190 1889.

29 1, 2, 1, 2, 1, 2, 2, 3, 4, 1, 5, 3, 6, 8, 3, 4, 8, 3, 0, 2, 8, 4, 4, 13, 9, 5, 18, 2, 2, 8, 3, 10,
0, 4, 2, 19, 14, 7, 8, 0, 20, 4, 1, 8, 2, 15, 7, 8, 26, 10, 26, 18, 10, 2, 10, 28, 29
RELATED TO EULERS PRODUCT. REF JRAM 179 128 38.

30 1, 2, 1, 2, 1, 2, 3, 1, 3, 2, 1, 2, 3, 3, 1, 3, 2, 1, 3, 2, 3, 4, 2, 1, 2, 1, 2, 7, 2, 3, 1, 5, 1,
3, 3, 2, 3, 3, 1, 5, 1, 2, 1, 6, 6, 2, 1, 2, 3, 1, 5, 3, 3, 3, 1, 3, 2, 1, 5, 7, 2, 1, 2, 7, 3, 5, 1, 2, 3
DIFFERENCES BETWEEN CONSECUTIVE PRIMES. REF AS1 870 (DIVIDED BY 2).

31 1, 2, 1, 2, 1, 3, 2, 2, 1, 3, 1, 2, 2, 4, 1, 3, 1, 3, 2, 2, 1, 4, 2, 2, 3, 3, 1, 3, 1, 5, 2, 2, 2,
4, 1, 2, 2, 4, 1, 3, 1, 3, 3, 2, 1, 5, 2, 3, 2, 3, 1, 4, 2, 4, 2, 2, 1, 4, 1, 2, 3, 6, 2, 3, 1, 3, 2, 3, 1
NUMBER OF PRIMES DIVIDING N + 2. REF AS1 844.

32 1, 2, 1, 2, 1, 3, 2, 2, 1, 4, 1, 2, 2, 5, 1, 4, 1, 4, 2, 2, 1, 7, 2, 2, 3, 4, 1, 5, 1, 7, 2, 2, 2,
9, 1, 2, 2, 7, 1, 5, 1, 4, 4, 2, 1, 12, 2, 4, 2, 4, 1, 7, 2, 7, 2, 2, 1, 11, 1, 2, 4, 11, 2, 5, 1, 4, 2, 5
NUMBER OF WAYS OF FACTORIZING N + 2. REF EUR 18 17 55.

33 1, 2, 1, 2, 1, 4, 2, 5, 3, 5, 4, 1, 3, 7, 4, 7, 6, 2, 9, 7, 1, 2, 8, 4, 1, 10, 9, 5, 2, 12, 11, 9,
5, 8, 7, 10, 6, 1, 3, 14, 12, 7, 4, 10, 5, 11, 10, 14, 13, 1, 8, 5, 17, 16, 4, 13, 6, 12, 1, 5, 15
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. AMM 56 526 49.

34 1, 2, 1, 2, 1, 4, 3, 13, 5, 1, 1, 8, 1, 2, 4, 1, 1, 40, 1, 11, 3, 7, 1, 7, 1, 1, 5, 1, 49, 4, 1,
65, 1, 4, 7, 11, 1, 399, 2, 1, 3, 2, 1, 2, 1, 5, 3, 2, 1, 10, 1, 1, 1, 1, 2, 1, 1, 3, 1, 4, 1, 1, 2, 5, 1
CONTINUED FRACTION EXPANSION OF EULERS CONSTANT. REF LE4. MTAC 25 403 71.

35 1, 2, 1, 2, 1, 5, 2, 2, 1, 5, 1, 2, 1, 14, 1, 5, 1, 5, 2, 2, 1, 15, 2, 2, 5, 4, 1, 4, 1, 51, 1, 2,
1, 14, 1, 2, 2, 14, 1, 6, 1, 4, 2, 2, 1, 52, 2, 5, 1, 5, 1, 15, 2, 13, 2, 2, 1, 13, 1, 2, 4, 267, 1, 4
NUMBER OF GROUPS OF ORDER N + 2. REF AJM 52 617 30. HS1. CM1 134.

36 1, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2,
2, 1, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 2, 1, 2, 1, 2, 2, 1, 2, 2, 1
A SELF-GENERATING SEQUENCE. REF AMM 64 198 57.

37 1, 2, 1, 2, 2, 1, 3, 2, 2, 3, 1, 3, 3, 2, 4, 2, 3, 3, 1, 4, 3, 3, 5, 2, 4, 4, 2, 5, 3, 3, 4, 1, 4,
4, 3, 6, 3, 5, 5, 2, 6, 4, 4, 6, 2, 5, 5, 3, 6, 3, 4, 4, 1, 5
REPRESENTATIONS AS A SUM OF FIBONACCI NUMBERS. REF FQ 4 305 66.

8 1, 2, 1, 2, 2, 2, 1, 2, 2, 3, 2, 1, 1, 2, 2, 3, 3, 2, 1, 2, 2, 2, 1, 1, 1, 2, 3, 4, 4, 3, 2, 1, 1,
, 1, 0, 0, 1, 2, 3, 3, 3, 2, 3, 3, 3, 3, 2, 2, 3, 3, 2, 2, 1, 0, 1, 1, 2, 1, 1, 1, 0, 1, 2, 2, 1, 2, 3, 3
ERTENS FUNCTION. REF WIEN 106(2A) 843 1897. LE1 7.

9 1, 2, 1, 2, 2, 2, 2, 3, 2, 4, 3, 4, 4, 4, 5, 5, 5, 6, 5, 6, 7, 6, 9, 7, 9, 9, 9, 11, 11, 11, 13,
2, 14, 15, 15, 17, 16, 18, 19, 20, 21, 23, 22, 25, 26, 27, 30, 29, 32, 32, 35, 37, 39, 40, 42
ARTITIONS INTO DISTINCT PRIMES. REF PNISI 21 186 55. PURB 107 285 57.

0 1, 2, 1, 2, 2, 2, 2, 3, 3, 3, 2, 3, 2, 4, 4, 2, 3, 4, 3, 4, 5, 4, 3, 5, 3, 4, 6, 3, 5, 6, 2, 5, 6,
, 5, 7, 4, 5, 8, 5, 4, 9, 4, 5, 7, 3, 6, 8, 5, 6, 8, 6, 7, 10, 6, 6, 12, 4, 5, 10, 3, 7, 9, 6, 5, 8, 7, 8
ECOMPOSITIONS OF 2N INTO SUM OF 2 ODD PRIMES. REF GR1 19. LE1 80.

1 1, 2, 1, 2, 2, 3, 1, 2, 2, 3, 2, 3, 3, 4, 1, 2, 2, 3, 2, 3, 3, 4, 2, 3, 3, 4, 3, 4, 4, 5, 1, 2, 2,
, 2, 3, 3, 4, 2, 3, 3, 4, 3, 4, 4, 5, 2, 3, 3, 4, 3, 4, 4, 5, 3, 4, 4, 5, 4, 5, 5, 6, 1, 2, 2, 3, 2, 3, 3
UMBER OF ONES IN BINARY EXPANSION OF N+1. REF FQ 4 374 66. ANY 175 177 70.

2 1, 2, 1, 2, 3, 1, 3, 1, 4, 1, 1, 2, 4, 5, 5, 1, 2, 3, 6, 3, 1, 5, 2, 4, 1, 7, 5, 3, 5, 7, 1, 5, 7,
, 1, 4, 5, 6, 8, 1, 2, 7, 9, 4, 5, 3, 5, 2, 1, 9, 5, 6, 7, 10, 11, 3, 1, 4, 11, 6, 7, 8, 9, 7, 1, 4, 9, 5
UADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

3 1, 2, 1, 2, 3, 3, 3, 1, 1, 3, 4, 2, 1, 3, 4, 1, 5, 3, 5, 5, 2, 4, 5, 3, 4, 2, 6, 1, 7, 7, 1, 3, 7,
, 4, 5, 7, 8, 6, 8, 7, 7, 6, 3, 7, 9, 7, 9, 8, 1, 3, 9, 5, 6, 3, 7, 10, 1, 6, 4, 10, 7, 9, 5, 9, 2, 11
UADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

4 1, 2, 1, 2, 3, 4, 8, 8, 18, 18, 38, 28, 142, 72, 234, 360, 669, 520, 2606, 1608, 7293
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5 1, 2, 1, 2, 3, 6, 8, 16, 24, 42, 69, 124, 208, 378, 668, 1214, 2220, 4110, 7630,
4308, 26931
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6 1, 2, 1, 2, 3, 6, 9, 18, 30, 56, 99, 186, 335, 630, 1161, 2182, 4080, 7710, 14532,
7594, 52377, 99858, 190557, 364722, 698870, 1342176, 2580795, 4971008, 9586395
RREDUCIBLE POLYNOMIALS, OR NECKLACES. REF IJM 5 663 61. JSIAM 12 288 64.

7 1, 2, 1, 2, 5, 1, 1, 2, 1, 1, 3, 10, 2, 1, 3, 2, 24, 1, 3, 2, 3, 1, 1, 1, 90, 2, 1, 12, 1, 1, 1,
, 5, 2, 6, 1, 6, 3, 1, 1, 2, 5, 2, 1, 2, 1, 1, 4, 1, 2, 2, 3, 2, 1, 1, 4, 1, 1, 2, 5, 2, 1, 1, 3, 29, 8, 3
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8 1, 2, 1, 2, 5, 17, 92, 994, 28262, 2700791
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9 1, 2, 1, 2, 9, 96, 2690, 226360, 64646855, 68339572672
HRESHOLD FUNCTIONS. REF PGEC 19 821 70.

0 1, 2, 1, 2, 1382, 4, 3617, 87734, 349222, 310732, 472728182, 2631724,
3571120588, 13785346041608, 7709321041217, 303257395102
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1 1, 2, 1, 3, 1, 2, 1, 4, 1, 2, 1, 3, 1, 2, 1, 5, 1, 2, 1, 3, 1, 2, 1, 4, 1, 2, 1, 3, 1, 2, 1, 6, 1,
, 1, 3, 1, 2, 1, 4, 1, 2, 1, 3, 1, 2, 1, 5, 1, 2, 1, 3, 1, 2, 1, 4, 1, 2, 1, 3, 1, 2, 1, 7, 1, 2, 1, 3, 1
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2 1, 2, 1, 3, 1, 3, 2, 5, 1, 6, 3, 2, 2, 8, 3, 9, 2, 3, 5, 11, 1, 10, 6, 9, 3, 14, 2, 15, 4, 5, 8,
, 3, 18, 9, 6, 2, 20, 3, 21, 5, 6, 11, 23, 2, 21, 10, 8, 6, 26, 9, 10, 3, 9, 14, 29, 2, 30, 15, 3
IEDUCED TOTIENT FUNCTION. REF CAU (2) 12 43. LE1 7. (DIVIDED BY 2.)

53 1, 2, 1, 3, 1, 4, 2, 3, 1, 8, 1, 3, 3, 8, 1, 8, 1, 8, 3, 3, 1, 20, 2, 3, 4, 8, 1, 13, 1, 16, 3, 3,
3, 26, 1, 3, 3, 20, 1, 13, 1, 8, 8, 3, 1, 48, 2, 8, 3, 8, 1, 20, 3, 20, 3, 3, 1, 44, 1, 3, 8, 32, 3, 13
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54 1, 2, 1, 3, 2, 1, 4, 1, 2, 5, 7, 4, 2, 6, 5, 1, 2, 3, 11, 6, 1, 5, 3, 10, 7, 12, 1, 2, 9, 4, 13,
7, 6, 5, 9, 14, 16, 8, 11, 2, 7, 3, 4, 10, 1, 17, 19, 2, 8, 14, 16, 1, 13, 20, 9, 3, 8, 5, 6, 11, 14
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55 1, 2, 1, 3, 2, 1, 5, 2, 1, 4, 6, 3, 2, 7, 4, 3, 1, 7, 4, 9, 1, 8, 5, 10, 4, 7, 3, 2, 5, 8, 12, 2,
1, 9, 11, 8, 4, 7, 2, 1, 14, 6, 9, 5, 11, 13, 2, 14, 16, 4, 11, 8, 3, 2, 7, 10, 17, 12, 11, 1, 7, 13
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

56 1, 2, 1, 3, 2, 3, 1, 4, 3, 5, 2, 5, 3, 4, 1, 5, 4, 7, 3, 8, 5, 7, 2, 7, 5, 8, 3, 7, 4, 5, 1, 6, 5,
9, 4, 11, 7, 10, 3, 11, 8, 13, 5, 12, 7, 9, 2, 9, 7, 12, 5, 13, 8, 11, 3, 10, 7, 11, 4, 9, 5, 6, 1, 7
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57 1, 2, 1, 3, 2, 3, 2, 1, 4, 5, 4, 1, 6, 3, 5, 7, 6, 7, 2, 8, 1, 7, 3, 6, 8, 5, 6, 3, 9, 8, 5, 4, 10,
11, 2, 11, 6, 4, 10, 12, 9, 12, 11, 1, 9, 13, 2, 7, 13, 4, 12, 13, 14, 11, 7, 9, 10, 4, 15, 14, 9, 6
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58 1, 2, 1, 3, 2, 3, 2, 5, 2, 6, 3, 4, 4, 8, 3, 9, 4, 6, 5, 11, 4, 10, 6, 9, 6, 14, 4, 15, 8, 10, 8,
12, 6, 18, 9, 12, 8, 20, 6, 21, 10, 12, 11, 23, 8, 21, 10, 16, 12, 26, 9, 20, 12, 18, 14, 29, 8
EULER TOTIENT FUNCTION. REF AS1 840. MTAC 23 682 69. (DIVIDED BY 2.)

59 1, 2, 1, 3, 2, 4, 4, 5, 7, 7, 11, 11, 16, 18, 23, 29, 34, 45, 52, 68, 81, 102, 126, 154,
194, 235, 296, 361, 450, 555, 685, 851, 1046, 1301, 1601, 1986, 2452, 3032, 3753, 4633
A(N) = A(N − 2) + A(N − 5). REF MMAG 41 17 68.

60 1, 2, 1, 3, 3, 2, 1, 2, 1, 4, 4, 4, 1, 4, 1, 4, 3, 2, 1, 4, 3, 5, 4, 2, 1, 3, 1, 3, 5, 2, 3, 3, 1,
4, 5, 2, 1, 3, 1, 5, 2, 4, 1, 2, 5, 3, 5, 2, 1, 2, 5, 2, 3, 2, 1, 3, 1, 6, 2, 3, 5, 2, 1, 4, 6, 5, 1, 3, 1
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61 1, 2, 1, 3, 3, 2, 4, 1, 3, 5, 5, 3, 6, 1, 7, 3, 6, 5, 3, 7, 6, 9, 9, 5, 8, 4, 10, 9, 7, 3, 11, 3,
9, 1, 11, 12, 8, 10, 12, 9, 11, 5, 9, 13, 3, 6, 1, 13, 3, 2, 10, 8, 15, 15, 7, 9, 13, 1, 15, 14, 15
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

62 1, 2, 1, 3, 4, 3, 7, 7, 8, 14, 15, 21, 28, 33, 47, 58, 76, 103, 125, 169, 220, 277, 373
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63 1, 2, 1, 3, 16, 380, 1227756, 400507805615570
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64 1, 2, 1, 4, 2, 2, 2, 2, 4, 1, 2, 4, 2, 2, 2, 4, 2, 1, 2, 2, 1, 2, 2, 4, 4, 2, 2, 1, 2, 1, 2, 2, 4,
2, 2, 4, 1, 2, 2, 2, 2, 2, 1, 2, 2, 2, 2, 2, 4, 2, 2, 4, 2, 2, 2, 2, 1, 1, 2, 4, 1, 2, 2, 4, 2, 2, 2, 2, 2
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65 1, 2, 1, 4, 2, 5, 4, 7, 8, 5, 2, 7, 10, 1, 10, 8, 2, 7, 4, 13, 1, 14, 8, 14, 11, 7, 14, 13, 16,
8, 11, 16, 17, 7, 2, 19, 4, 17, 19, 11, 1, 14, 5, 10, 22, 16, 4, 23, 20, 8, 23, 13, 10, 5, 16, 22
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66 1, 2, 1, 4, 7, 24, 62, 216, 710, 2570, 9215, 34146, 126853, 477182
COLORED POLYOMINOES. REF LU2.

67 1, 2, 1, 4, 10, 36, 108, 392, 1363, 5000, 18223, 67792, 252938, 952540
ONE-SIDED COLORED POLYOMINOES. REF LU2.

68 1, 2, 1, 6, 12, 46, 92, 341, 1787, 9233
QUEENS PROBLEM. REF SL1 47. WE2 238.

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69 1, 2, 2, 1, 0, 2, 1, 2, 2, 3, 2, 1, 3, 3, 3, 1, 2, 4, 3, 3, 3, 5, 3, 4, 3, 5, 4, 3, 1, 2, 5, 5, 4, 4, 5, 5, 5, 6, 5, 7, 4, 7, 5, 3, 5, 9, 5, 7, 7, 9, 6, 5, 5, 8, 5, 8, 7, 11, 6, 7, 4, 9, 7, 11, 7, 10, 9, 9
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70 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 2, 1, 1, 2, 1, 1, 2, 2, 1, 2, 1, 1, 2, 1, 2, 2, 1, 1, 2, 1, 1, 2, 1, 2, 2, 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 1, 1, 2, 1, 1, 2, 2, 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 2, 1, 1, 2
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71 1, 2, 2, 1, 2, 1, 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 1, 1, 2, 1, 2, 2, 1, 1, 2, 2, 1, 2, 1, 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 1, 2, 2, 1, 2, 1, 1, 2, 1, 2, 2, 1, 2, 1, 1, 2, 2, 1, 1, 2, 1, 2, 2, 1, 2, 1, 1, 2, 1
A SELF-GENERATING SEQUENCE.

72 1, 2, 2, 1, 2, 1, 2, 4, 2, 4, 1, 4, 2, 3, 6, 6, 4, 3, 4, 4, 2, 2, 6, 4, 8, 4, 1, 4, 5, 2, 6, 4, 4, 2, 3, 6, 8, 8, 8, 1, 8, 4, 7, 4, 10, 8, 4, 5, 4, 3, 4, 10, 6, 12, 2, 4, 8, 8, 4, 14, 4, 5, 8, 6, 3, 6, 12
DIVISOR CLASSES OF QUADRATIC FIELDS. REF BO1 425.

73 1, 2, 2, 1, 2, 2, 2, 3, 2, 2, 4, 2, 2, 4, 2, 3, 4, 4, 2, 3, 4, 2, 6, 3, 2, 6, 4, 3, 4, 4, 4, 6, 4, 2, 6, 4, 4, 8, 4, 3, 6, 4, 4, 5, 4, 4, 6, 6, 4, 6, 6, 4, 8, 4, 2, 9, 4, 6, 8, 4, 4, 8, 8, 3, 8, 8, 4, 7, 4
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74 1, 2, 2, 1, 2, 3, 1, 3, 1, 2, 4, 3, 4, 2, 1, 3, 5, 5, 4, 2, 5, 4, 5, 1, 6, 4, 2, 1, 4, 7, 7, 6, 7, 2, 4, 6, 5, 7, 8, 8, 3, 7, 1, 5, 6, 3, 2, 8, 9, 7, 6, 8, 9, 4, 2, 5, 8, 1, 10, 10, 3, 7, 5, 2, 8, 10, 9, 7
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75 1, 2, 2, 1, 4, 1, 4, 2, 2, 3, 2, 2, 4, 3, 2, 4, 2, 4, 4, 4, 2, 5, 2, 6, 2, 5, 0, 4, 2, 6, 4, 4, 2, 7, 0, 8, 2, 3, 2, 6, 2, 8, 4, 6, 2, 7, 2, 10, 2, 8, 0, 6, 2, 8, 2, 6, 0, 7, 2, 12, 4, 5, 2, 10, 0, 12, 2
DECOMPOSITIONS OF N INTO SUM OF 2 PRIMES. REF PLMS 23 315 23.

76 1, 2, 2, 2, 0, 2, 1, 3, 2, 3, 1, 4, 2, 4, 3, 5, 4, 7, 3, 6, 5, 8, 6, 10, 6, 10, 9, 12, 9, 15, 11, 16, 14, 18, 14, 22, 19, 25, 22, 27, 23, 33, 29, 36, 33, 40, 38, 49, 43, 53, 51, 61, 57, 71
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77 1, 2, 2, 2, 2, 2, 3, 2, 3, 3, 3, 4, 3, 2, 4, 3, 4, 4, 3, 3, 5, 4, 4, 6, 4, 3, 6, 3, 4, 7, 4, 5, 6, 3, 5, 7, 6, 5, 7, 5, 5, 9, 5, 4, 10, 4, 5, 7, 4, 6, 9, 6, 6, 9, 7, 7, 11, 6, 6, 12, 4, 5, 10, 4, 7, 10, 6
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78 1, 2, 2, 2, 2, 3, 3, 3, 4, 5, 5, 5, 6, 7, 8, 8, 9, 11, 12, 12, 14, 16, 17, 18, 20, 23, 25, 26, 29, 33, 35, 37, 41, 46, 49, 52, 57, 63, 68, 72, 78, 87, 93, 98, 107, 117, 125, 133, 144
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79 1, 2, 2, 2, 2, 3, 4, 4, 4, 5, 6, 6, 6, 8, 9, 10, 10, 12, 13, 14, 14, 16, 19, 20, 21, 23, 26, 27, 28, 31, 34, 37, 38, 43, 46, 49, 50, 55, 60, 63, 66, 71, 78, 81, 84, 90, 98, 104, 107, 116
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80 1, 2, 2, 2, 4, 4, 4, 7, 7, 8, 12, 12, 16, 21, 21, 31, 37, 38, 58, 65, 71, 106, 114, 135, 191, 201, 257, 341, 359, 485, 605, 652, 904, 1070, 1202, 1664, 1894, 2237, 3029, 3370
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81 1, 2, 2, 2, 4, 6, 6, 8, 11, 13, 17, 24, 28, 36
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82 1, 2, 2, 2, 4, 6, 10, 18, 32, 56, 102, 186, 341, 630, 1170, 2184, 4096, 7710, 14563, 27594, 52428, 99864, 190650, 364722, 699050, 1342177, 2581110, 4971026, 9586980
(2N)/N.**

83 1, 2, 2, 3, 2, 2, 3, 2, 5, 2, 3, 2, 6, 3, 5, 2, 2, 2, 2, 7, 5, 3, 2, 3, 5, 2, 5, 2, 6, 3, 3, 2, 3, 2, 2, 6, 5, 2, 5, 2, 2, 2, 19, 5, 2, 3, 2, 3, 2, 6, 3, 7, 7, 6, 3, 5, 2, 6, 5, 3, 3, 2, 5, 17, 10, 2, 3
LEAST POSITIVE PRIMITIVE ROOTS. REF AS1 864.

84 1, 2, 2, 3, 2, 2, 3, 2, 5, 2, 3, 2, 7, 3, 5, 2, 2, 2, 2, 7, 5, 3, 2, 3, 5, 2, 5, 2, 11, 3, 3, 2, 3 2, 2, 7, 5, 2, 5, 2, 2, 2, 19, 5, 2, 3, 2, 3, 2, 7, 3, 7, 7, 11, 3, 5, 2, 43, 5, 3, 3, 2, 5, 17, 17, 2
LEAST POSITIVE PRIME PRIMITIVE ROOTS. REF RS5 2.

85 1, 2, 2, 3, 2, 3, 4, 2, 2, 7, 2, 6, 9, 2, 2, 3, 2, 4, 2, 5, 2, 3, 3, 5, 2, 2, 3, 6, 3, 9, 3, 3, 4, 2, 5, 5, 4, 2, 2, 3, 2, 2, 5, 2, 2, 4, 9, 3, 6, 3, 2, 7, 3, 3, 2, 2, 2, 5, 3, 6, 2, 7, 2, 10, 2, 5, 10, 3
LEAST NEGATIVE PRIMITIVE ROOTS. REF AS1 864.

86 1, 2, 2, 3, 2, 4, 2, 4, 3, 4, 2, 6, 2, 4, 4, 5, 2, 6, 2, 6, 4, 4, 2, 8, 3, 4, 4, 6, 2, 8, 2, 6, 4, 4, 4, 9, 2, 4, 4, 8, 2, 8, 2, 6, 6, 4, 2, 10, 3, 6, 4, 6, 2, 8, 4, 8, 4, 4, 2, 12, 2, 4, 6, 7, 4, 8, 2, 6
NUMBER OF DIVISORS OF N. REF AS1 840.

87 1, 2, 2, 3, 2, 4, 2, 4, 4, 4, 2, 6, 2, 4, 4, 6, 2, 8, 2, 6, 4, 4, 2, 8, 6, 4, 6, 6, 2, 8, 2, 8, 4, 4, 4, 12, 2, 4, 4, 8, 2, 8, 2, 6, 8, 4, 2, 12, 8, 12, 4, 6, 2, 12, 4, 8, 4, 4, 2, 12, 2, 4, 8, 12, 4, 8
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88 1, 2, 2, 3, 3, 3, 4, 3, 4, 5, 4, 5, 4, 4, 6, 5, 6, 6, 5, 6, 4, 5, 7, 6, 8, 7, 6, 8, 6, 7, 8, 6, 7, 5, 5, 8, 7, 9, 9, 8, 10, 7, 8, 10, 8, 10, 8, 7, 10, 8, 9, 9, 7, 8, 5, 6, 9, 8, 11, 10, 9, 12, 9, 11, 1[illegible]
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89 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6, 6, 7, 7, 7, 7, 7, 7, 7, 8, 8, 8, 8, 8, 8, 8, 8, 9, 9, 9, 9, 9, 9, 9, 9, 9, 10, 10, 10, 10, 10, 10, 10, 10, 10, 10, 11, 11, 11, 11, 11, 11
A SELF-GENERATING SEQUENCE. REF MMAG 38 186 65. KN1 1 43.

90 1, 2, 2, 3, 3, 4, 4, 4, 4, 5, 5, 6, 6, 6, 6, 7, 7, 8, 8, 8, 8, 9, 9, 9, 9, 9, 9, 10, 10, 11, 11, 11, 11, 11, 11, 12, 12, 12, 12, 13, 13, 14, 14, 14, 14, 15, 15, 15, 15, 15, 15, 16, 16, 16, 16
NUMBER OF PRIMES NOT GREATER THAN N+1. REF AS1 870.

91 1, 2, 2, 3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6, 6, 7, 7, 7, 7, 8, 8, 8, 8, 9, 9, 9, 9, 9, 10, 10, 10, 10, 10, 11, 11, 11, 11, 11, 12, 12, 12, 12, 12, 12, 13, 13, 13, 13, 13, 13, 14, 14, 14, 14, 14
A SELF-GENERATING SEQUENCE. REF AMM 74 740 67.

92 1, 2, 2, 3, 3, 4, 4, 4, 5, 5, 6, 6, 6, 6, 7, 7, 7, 8, 8, 8, 8, 9, 9, 9, 10, 10, 10, 10, 10, 11, 11, 11, 11, 12, 12, 12, 12, 12, 13, 13, 13, 13, 13, 14, 14, 14, 14, 15, 15, 15, 15, 15, 15, 16
INTEGER PART OF SQUARE ROOT OF PRIMES. REF AS1 2.

93 1, 2, 2, 3, 3, 4, 5, 6, 7, 9, 10, 12, 14, 17, 19, 23, 26, 30, 35, 40, 46, 52, 60, 67, 77, 87, 98, 111, 124, 140, 157, 175, 197, 219, 244, 272, 302, 336, 372, 413, 456, 504, 557
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94 1, 2, 2, 3, 3, 5, 6, 8, 8, 12, 13, 17, 19, 26, 28, 37, 40, 52, 58, 73, 79, 102, 113, 139, 154, 191, 210, 258, 284, 345, 384, 462, 509, 614, 679, 805, 893, 1060, 1171, 1382
PARTITIONS INTO NON-PRIME PARTS. REF JNSM 9 91 69.

95 1, 2, 2, 3, 3, 5, 6, 8, 9, 11, 14, 19, 22
ROTATABLE PARTITIONS. REF JLMS 43 504 68.

96 1, 2, 2, 3, 4, 1, 8, 1, 10, 9, 16, 18, 12, 42, 4, 58, 38, 82, 88, 54, 188, 18, 248, 151, 334, 338, 260, 760, 120
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97 1, 2, 2, 3, 4, 3, 4, 4, 3, 4, 4, 5, 5, 4, 6, 5, 6, 6, 6, 4, 6, 7, 6, 6, 5, 7, 6, 10, 4, 7, 8, 5, 5, 6, 7, 6, 6, 6, 8, 6, 6, 6, 5, 5, 6, 7, 7, 7, 6, 7, 6, 5, 7, 6, 7, 9, 7, 7, 7, 9, 5, 7, 10, 7, 7
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98 1, 2, 2, 3, 4, 5, 6, 7, 8, 10, 11, 13, 14, 16, 18, 20, 22, 26, 29
DENUMERANTS. REF R1 152.

99 1, 2, 2, 3, 4, 5, 6, 7, 8, 11, 12, 15, 16, 19, 22, 25, 28, 34, 40
DENUMERANTS. REF R1 152.

100 1, 2, 2, 3, 4, 5, 6, 8, 10, 12, 15, 18, 22, 27, 32, 38, 46, 54, 64, 76, 89, 104, 122, 142, 165, 192, 222, 256, 296, 340, 390, 448, 512, 585, 668, 760, 864, 982, 1113, 1260, 1426
PARTITIONS INTO DISTINCT PARTS. REF AS1 836.

101 1, 2, 2, 3, 4, 5, 7, 9, 11, 15, 18, 23, 30, 37, 47, 58, 71, 90, 110, 136, 164, 201, 248, 300, 364, 436, 525, 638, 764, 919, 1090, 1297, 1549, 1845, 2194, 2592, 3060, 3590
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102 1, 2, 2, 3, 4, 5, 7, 9, 12, 16, 21, 28, 37, 49, 65, 86, 114, 151, 200, 265, 351, 465, 616, 816, 1081, 1432, 1897, 2513, 3329, 4410, 5842, 7739, 10252, 13581, 17991, 23833
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103 1, 2, 2, 3, 4, 6, 9, 14, 22, 35, 56, 90, 145, 234, 378, 611, 988, 1598, 2585, 4182, 6766, 10947, 17712, 28658, 46369, 75026, 121394, 196419, 317812, 514230, 832041
FIBONACCI NUMBERS + 1. REF JA2 97.

104 1, 2, 2, 3, 5, 6, 9, 13, 14, 15, 20
RELATED TO ZARANKIEWICZS PROBLEM. REF TI1 126.

105 1, 2, 2, 3, 6, 0, 6, 7, 9, 7, 7, 4, 9, 9, 7, 8, 9, 6, 9, 6, 4, 0, 9, 1, 7, 3, 6, 6, 8, 7, 3, 1, 2, 7, 6, 2, 3, 5, 4, 4, 0, 6, 1, 8, 3, 5, 9, 6, 1, 1, 5, 2, 5, 7, 2, 4, 2, 7, 0, 8, 9, 7, 2, 4, 5, 4, 1, 0, 5
SQUARE ROOT OF 5. REF RS4 XVIII. MTAC 22 234 68.

106 1, 2, 2, 3, 7, 15, 12, 30, 8, 32, 162, 21
FROM SEDLACEKS PROBLEM ON SOLUTIONS OF X + Y = Z. REF GU8.

107 1, 2, 2, 3, 7, 25, 121, 721, 5041, 40321, 362881, 3628801, 39916801, 479001601, 6227020801, 87178291201, 1307674368001, 20922789888001, 355687428096001
FACTORIAL N + 1. REF AS1 833.

108 1, 2, 2, 4, 2, 4, 2, 4, 6, 2, 6, 4, 2, 4, 6, 6, 2, 6, 4, 2, 6, 4, 6, 8, 4, 2, 4, 2, 4, 14, 4, 6, 2, 10, 2, 6, 6, 4, 6, 6, 2, 10, 2, 4, 2, 12, 12, 4, 2, 4, 6, 2, 10, 6, 6, 6, 2, 6, 4, 2, 10, 14, 4, 2, 4
DIFFERENCES BETWEEN CONSECUTIVE PRIMES. REF AS1 870.

109 1, 2, 2, 4, 2, 4, 4, 8, 2, 4, 4, 8, 4, 8, 8, 16, 2, 4, 4, 8, 4, 8, 8, 16, 4, 8, 8, 16, 8, 16, 1 32, 2, 4, 4, 8, 4, 8, 8, 16, 4, 8, 8, 16, 8, 16, 16, 32, 4, 8, 8, 16, 8, 16, 16, 32, 8, 16, 16, 32
RELATED TO BINARY EXPANSION OF N. REF GO3.

110 1, 2, 2, 4, 2, 6, 2, 6, 4, 10, 2, 12, 6, 4, 4, 16, 6, 18, 4, 6, 10, 22, 2, 20, 12, 18, 6, 28, 4, 30, 8, 10, 16, 12, 6, 36, 18, 12, 4, 40, 6, 42, 10, 12, 22, 46, 4, 42, 20, 16, 12, 52, 18, 2C
REDUCED TOTIENT FUNCTION. REF CAU (2) 12 43. LE1 7.

111 1, 2, 2, 4, 2, 6, 4, 6, 4, 10, 4, 12, 6, 8, 8, 16, 6, 18, 8, 12, 10, 22, 8, 20, 12, 18, 12, 28, 8, 30, 16, 20, 16, 24, 12, 36, 18, 24, 16, 40, 12, 42, 20, 24, 22, 46, 16, 42, 20, 32, 24
EULER TOTIENT FUNCTION. REF AS1 840. MTAC 23 682 69.

112 1, 2, 2, 4, 4, 6, 7, 10, 11, 16, 17, 23, 26, 33, 37, 47, 52, 64, 72, 86, 96, 115, 127, 149, 166, 192, 212, 245, 269, 307, 338, 382, 419, 472, 515, 576, 629, 699, 760, 843, 913
EXPANSION OF A GENERATING FUNCTION. REF CAY 10 415.

113 1, 2, 2, 4, 4, 7, 8, 12, 14, 21, 24, 34, 41, 55, 66, 88, 105, 137, 165, 210, 253, 320, 383, 478, 574, 708, 847, 1039, 1238, 1507, 1794, 2167, 2573, 3094, 3660, 4378, 5170
PARTITIONS WITH NO PART OF SIZE 1. REF TA1 1 334. AS1 836.

114 1, 2, 2, 4, 4, 8, 9, 18, 23, 44, 63, 122, 190, 362, 612, 1162, 2056, 3912, 7155, 1364
NECKLACES. REF IJM 5 662 61.

115 1, 2, 2, 4, 4, 8, 10, 20, 30, 56, 94, 180, 316, 596, 1096, 2068, 3856, 7316, 13798, 26272
NECKLACES. REF IJM 5 662 61.

116 1, 2, 2, 4, 5, 7, 9, 13, 16, 22, 27, 36, 44, 57, 70, 89, 108, 135, 163, 202, 243, 297, 355, 431, 513, 617, 731, 874, 1031, 1225, 1439, 1701, 1991, 2341, 2731, 3197, 3717
PARTITIONS INTO PARTS PRIME TO 3. REF PSPM 8 145 65.

117 1, 2, 2, 4, 5, 9, 12, 21, 30, 51, 76, 127, 195, 322, 504, 826, 1309, 2135, 3410, 5545 8900, 14445, 23256, 37701, 60813, 98514, 159094, 257608, 416325, 673933, 1089648
PACKING A BOX WITH DOMINOES. REF AMM 69 61 62.

118 1, 2, 2, 4, 5, 10, 14, 26, 42, 78, 132, 249, 445, 842, 1561, 2988, 5671, 10981, 21209, 41472, 81181, 160176, 316749, 629933, 1256070, 2515169, 5049816, 10172638
SERIES-REDUCED TREES. REF AM1 101 150 59. HA5 232. CA3.

119 1, 2, 2, 4, 6, 6, 11, 16, 20, 28, 41, 51, 70, 93, 122
PLANAR PARTITIONS. REF MA2 2 332.

120 1, 2, 2, 4, 6, 8, 18, 20, 56, 48, 178, 132, 574, 348, 1870, 1008
FOLDING A STRIP OF STAMPS. REF JCT 5 151 68.

121 1, 2, 2, 4, 6, 10, 16, 30, 52, 94
SHIFT REGISTERS. REF GO1 172.

122 1, 2, 2, 4, 6, 11, 18, 37, 66, 135, 265
BORON TREES. REF CAY 9 451.

123 1, 2, 2, 4, 6, 12, 20, 39, 71, 137, 261, 511, 995, 1974, 3915, 7841, 15749, 31835, 64540, 131453, 268498, 550324, 1130899, 2330381, 4813031, 9963288, 20665781
SERIES-REDUCED PLANTED TREES. AM1 101 150 59. CA3.

124 1, 2, 2, 4, 7, 12, 16, 32
COVERING NUMBERS. REF JLMS 44 60 69.

125 1, 2, 2, 4, 8, 4, 16, 12, 48, 80, 136, 420, 1240, 2872, 7652, 18104, 50184
QUEENS PROBLEM. REF PSAM 10 93 60.

126 1, 2, 2, 4, 8, 13, 25, 44, 83, 152, 286, 538, 1020, 1942, 3725, 7145, 13781, 26627, 51572, 100099, 194633, 379037, 739250, 1443573, 2822186, 5522889
POPULATION OF U2 + 16V**2. REF MTAC 20 567 66.**

127 1, 2, 2, 4, 10, 16, 28, 48, 76, 110, 144, 182, 222, 264, 310, 356, 408, 468, 536, 610, 684, 762, 842, 924, 1010, 1096, 1188, 1288, 1396, 1510, 1624, 1742, 1862
PERIODIC DIFFERENCES. REF TCPS 2 220 1827.

128 1, 2, 2, 4, 10, 28, 84, 264, 858, 2860, 9724, 33592, 117572, 416024, 1485800, 5348880, 19389690, 70715340
FROM BINOMIAL COEFFICIENTS. REF TH1 164. FMR 1 55.

129 1, 2, 2, 4, 12, 22, 58, 158, 448, 1342, 4199, 13384
POLYTOPES BY NUMBER OF EDGES. REF JCT 7 157 69.

130 1, 2, 2, 5, 4, 7, 7, 11, 9, 8, 6, 9, 4, 6, 22, 10, 4, 8, 4
PRIMITIVE GROUPS. REF JL2 178.

131 1, 2, 2, 5, 5, 12, 12, 27, 28, 64, 67, 147, 158, 348, 373, 799, 879, 1886, 2069, 4335, 4864
SQUARE FILAMENTS. REF PL2 1 337 70.

132 1, 2, 2, 6, 6, 18, 16, 48, 60, 176, 144, 630, 756, 1800, 2048, 7710, 7776, 27594, 24000, 84672
RELATED TO EULERS TOTIENT FUNCTION. REF BE1 296.

133 1, 2, 2, 6, 8, 18, 30, 67, 127
BORON TREES. REF CAY 9 451.

134 1, 2, 2, 6, 9, 17, 30, 54, 98, 183, 341, 645, 1220, 2327, 4451, 8555, 16489, 31859, 61717, 119779, 232919, 453584, 884544, 1727213, 3376505, 6607371
POPULATION OF U2 + 12V**2. REF MTAC 20 567 66.**

135 1, 2, 2, 6, 9, 20, 37, 86, 183, 419
HYDROCARBONS. REF BS1 201.

136 1, 2, 2, 6, 14, 34, 82, 198, 478, 1154, 2786, 6726, 16238, 39202, 94642, 228486, 551614, 1331714, 3215042, 7761798, 18738638, 45239074, 109216786, 263672646
A(N) = 2A(N − 1) + A(N − 2). REF AJM 1 187 1878.

137 1, 2, 2, 6, 16, 20, 132, 28, 1216, 936, 23540, 34782, 138048, 469456, 1601264, 9112560, 18108928, 182135008, 161934624, 3804634784, 404007680, 83297957568
FROM PERMUTATIONS OF ORDER 2. REF CJM 7 168 55.

138 1, 2, 2, 6, 38, 390, 6062, 134526
COLORED GRAPHS. REF CJM 22 596 70.

139 1, 2, 2, 7, 10, 20, 36, 65, 118, 221, 409, 776, 1463, 2788, 5328, 10222, 19714, 38054, 73685, 142944, 277838, 540889, 1054535, 2058537, 4023278
POPULATION OF U2 + 10V**2. REF MTAC 20 563 66.**

140 1, 2, 2, 8, 8, 112, 656, 5504, 49024, 491264
RELATED TO LATIN RECTANGLES. REF R1 210.

141 1, 2, 2, 8, 12, 88, 176, 2752, 8784
SELF-COMPLEMENTARY ORIENTED GRAPHS. REF KNAW 73 443 70.

142 1, 2, 2, 8, 72, 1536, 86080, 14487040, 8274797440, 17494930604032
THRESHOLD FUNCTIONS. REF PGEC 19 821 70.

143 1, 2, 2, 9, 11, 37, 79, 249, 671, 2182, 6692
POLYTOPES BY NUMBER OF EDGES. REF JCT 7 157 69.

144 1, 2, 2, 10, 28, 207, 1288, 10366, 91296
HIT POLYNOMIALS. REF RI3.

145 1, 2, 2, 10, 218, 64594, 4294642034, 18446744047940725978, 340282366920938463334247399005993378250
NONDEGENERATE BOOLEAN FUNCTIONS. REF HA2 170.

146 1, 2, 2, 10, 52246, 26316452096451006B0142
INVERTIBLE BOOLEAN FUNCTIONS. REF PGEC 13 350 64.

147 1, 2, 2, 17, 1, 91
QUEENS PROBLEM. REF SL1 49.

148 1, 2, 2, 18, 66, 374, 1694, 9822, 51698
BAXTER PERMUTATIONS. REF MA4 2 25 67.

149 1, 2, 2, 20, 38, 146, 368, 1070, 2824, 7680, 19996
SUSCEPTIBILITY FOR SQUARE LATTICE. REF PHA 28 924 62.

150 1, 2, 2, 22, 563, 1676257
TYPES OF LATIN SQUARES. REF R1 210. FY1 22. JCT 5 177 68.

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151 1, 2, 3, 0, 2, 5, 8, 5, 0, 9, 2, 9, 9, 4, 0, 4, 5, 6, 8, 4, 0, 1, 7, 9, 9, 1, 4, 5, 4, 6, 8, 4, 3 6, 4, 2, 0, 7, 6, 0, 1, 1, 0, 1, 4, 8, 8, 6, 2, 8, 7, 7, 2, 9, 7, 6, 0, 3, 3, 3, 2, 7, 9, 0, 0, 9, 6, 7,
NATURAL LOGARITHM OF 10. REF RS4 2.

152 1, 2, 3, 0, 11, 0, 17, 15, 14, 51
A PARTITION FUNCTION. REF JNSM 9 103 69.

153 1, 2, 3, 0, 25, 152, 1350, 12644, 131391, 1489568, 18329481, 243365514, 3468969962, 52848096274, 857073295427, 14744289690560, 268202790690465
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154 1, 2, 3, 1, 1, 4, 5, 1, 3, 1, 3, 1, 1, 8, 15, 3, 7, 4, 5, 2, 3, 3, 6, 2, 3, 2, 3, 1, 1, 16, 19, 10, 5, 15, 4, 5, 7, 15, 3, 7, 4, 5, 2, 3, 5, 13, 3, 5, 4, 7, 1, 3, 3, 5, 2, 3, 1, 3, 1, 1, 32, 47, 11
A PROBLEM IN PARITY. REF IJ1 11 163 69.

155 1, 2, 3, 1, 2, 3, 4, 2, 1, 2, 3, 3, 2, 3, 4, 1, 2, 2, 3, 2, 3, 3, 4, 3, 1, 2, 3, 4, 2, 3, 4, 2, 3, 2, 3, 1, 2, 3, 4, 2, 2, 3, 3, 3, 2, 3, 4, 3, 1, 2, 3, 2, 2, 3, 4, 3, 3, 2, 3, 4, 2, 3, 4, 1, 2, 3, 3, 2,
LEAST NUMBER OF SQUARES TO REPRESENT N.

156 1, 2, 3, 1, 4, 3, 2, 1, 4, 2, 6, 4, 1, 2, 7, 1, 4, 3, 2, 1, 4, 6, 7, 4, 1, 2, 8, 5, 4, 7, 2, 1, 8, 6, 7, 4, 1, 2, 3, 1, 4, 7, 2, 1, 8, 2, 7, 4, 1, 2, 8, 1, 4, 7, 2, 1, 4, 2, 7, 4, 1, 2, 8, 1, 4, 7, 2, 1, 8
THE GAME OF KAYLES. REF PCPS 52 516 56.

157 1, 2, 3, 1, 5, 4, 3, 3, 9, 2, 11, 5
A NUMBER-THEORETIC FUNCTION. REF MTS 67 11 58.

158 1, 2, 3, 2, 0, 1, 7, 2, 6, 8, 22, 7, 0, 33, 3, 14, 51, 46, 19, 12, 94, 42, 23, 113, 150, 54, 48, 345, 116, 109, 403, 498, 140, 219, 1057, 326, 259, 1271, 1641, 308, 656, 3396
FROM SYMMETRIC FUNCTIONS. REF PLMS 23 297 23.

159 1, 2, 3, 2, 1, 2, 2, 4, 2, 2, 1, 0, 4, 2, 3, 2, 2, 4, 0, 2, 2, 0, 4, 2, 3, 0, 2, 6, 2, 2, 1, 2, 0, 2, 2, 2, 2, 4, 2, 0, 4, 4, 4, 0, 1, 2, 0, 4, 2, 0, 2, 2, 5, 2, 0, 2, 2, 4, 4, 2, 0, 2, 4, 2, 2, 0, 4, 0, 0
THE SQUARE OF EULERS PRODUCT. REF PLMS 21 190 1889.

160 1, 2, 3, 2, 2, 4, 4, 4, 4, 4, 3, 5, 4, 3, 5, 5, 6, 6, 4, 6, 7, 4, 4, 7, 7, 6, 5, 5, 7, 8, 6, 5, 4, 7, 6, 6, 6, 6, 6, 6, 6, 4, 7, 6, 7, 7, 7, 5, 6, 6, 6, 7, 6, 7, 8, 7, 10, 7, 9, 9, 7, 10, 5, 5
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161 1, 2, 3, 2, 3, 4, 4, 4, 5, 6, 5, 4, 6, 4, 7, 8, 3, 6, 8, 6, 7, 10, 8, 6, 10, 6, 7, 12, 5, 10, 12, 4, 10, 12, 9, 10, 14, 8, 9, 16, 9, 8, 18, 8, 9, 14, 6, 12, 16, 10, 11, 16, 12, 14, 20, 12, 11, 24
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162 1, 2, 3, 2, 5, 2, 3, 7, 2, 11, 13, 2, 3, 5, 17, 19, 2, 23, 7, 29, 3, 31, 2, 37, 41, 43, 47, 5, 53, 59, 2, 11, 61, 3, 67, 71, 73, 79, 13, 83, 89, 2, 97, 101, 103, 107, 7, 109, 113, 17, 127
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163 1, 2, 3, 2, 5, 5, 7, 10, 12, 17, 22, 29, 39, 51, 68, 90, 119, 158, 209, 277, 367, 486, 644, 853, 1130, 1497, 1983, 2627, 3480, 4610, 6107, 8090, 10717, 14197, 18807, 24914
A(N) = A(N − 2) + A(N − 3). REF AMM 15 209 08. JA2 90. FQ 6(3) 68 68.

164 1, 2, 3, 3, 3, 5, 7, 6, 6, 10, 12, 11, 13, 17, 20, 21, 21, 27, 34, 33, 36, 46, 51, 53, 58, 68, 78, 82, 89, 104, 118, 123, 131, 154, 171, 179, 197, 221, 245, 262, 279, 314, 349, 369
MOCK THETA NUMBERS. REF TAMS 72 495 52.

165 1, 2, 3, 3, 5, 9, 16, 28, 50, 89, 159, 285, 510, 914, 1639, 2938, 5269, 9451, 16952, 30410, 54555, 97871, 175588, 315016, 565168, 1013976, 1819198, 3263875, 5855833
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166 1, 2, 3, 4, 3, 5, 3, 6, 1, 2, 6, 7, 4, 5, 8, 3, 9, 7, 6, 9, 1, 2, 6, 11, 4, 10, 9, 3, 12, 9, 12, 13, 8, 3, 14, 12, 13, 6, 1, 2, 12, 11, 5, 15, 16, 9, 3, 13, 8, 15, 12, 17, 16, 6, 14, 15, 10, 3, 17
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55. MTAC 23 459 69.

167 1, 2, 3, 4, 5, 3, 7, 4, 6, 5, 11, 4, 13, 7, 5, 6, 17, 6, 19, 5, 7, 11, 23, 4
N DIVIDES FACTORIAL A(N). REF AMM 25 210 18.

168 1, 2, 3, 4, 5, 5, 7, 6, 6, 7, 11, 7, 13, 9, 8, 8, 17, 8, 19, 9, 10, 13, 23, 9, 10, 15, 9, 11, 29, 10, 31, 10, 14, 19, 12, 10, 37, 21, 16, 11, 41, 12, 43, 15, 11, 25, 47, 11, 14, 12, 20, 17
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169 1, 2, 3, 4, 5, 6, 5, 7, 6, 8, 8, 9, 10, 10, 8, 11, 10, 11, 13, 10, 12, 14, 15, 13, 15, 16, 13, 14, 16, 17, 13, 14, 16, 18, 17, 18, 17, 19, 20, 20, 15, 17, 20, 21, 19, 22, 20, 21, 19, 20
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. AMM 56 526 49.

170 1, 2, 3, 4, 5, 6, 7, 1, 2, 3, 4, 5, 6, 7, 8, 2, 3, 4, 5, 6, 7, 8, 9, 3, 4, 5, 1, 2, 3, 4, 5, 4, 5, 6, 2, 3, 4, 5, 6, 5, 6, 7, 3, 4, 5, 6, 7, 6, 7, 8, 4, 5, 6, 2, 3, 4, 5, 6, 5, 6, 7, 3, 4, 1, 2, 3, 4, 5, 6
LEAST NUMBER OF CUBES TO REPRESENT N. REF JRAM 14 279 1835. LE1 81.

171 1, 2, 3, 4, 5, 6, 7, 6, 6, 10, 11, 12, 13, 14, 15, 8, 17, 12, 19, 20, 21, 22, 23, 18, 10, 26, 9, 28, 29, 30, 31, 10, 33, 34, 35, 24, 37, 38, 39, 30, 41, 42, 43, 44, 30, 46, 47, 24, 14
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172 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 3, 4, 5, 6, 7, 8, 9, 10, 11, 1
LEAST NUMBER OF FOURTH POWERS TO REPRESENT N. REF JRAM 46 3 1853. LE1 82.

173 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 4
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174 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 42, 43, 45, 46, 47, 48, 50, 51, 52, 5
N2 + N + 41 IS PRIME.**

175 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 20, 22, 24, 30, 33, 36, 40, 44, 48, 50, 55, 60, 66, 70, 77, 80, 88, 90, 99, 100, 101, 102, 104, 105, 110, 111, 112, 115, 120, 122, 124, 1
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176 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 15, 16, 18, 21, 22, 24, 25, 28, 30, 33, 37, 40, 42, 45, 48, 57, 58, 60, 70, 72, 78, 85, 88, 93, 102, 105, 112, 120, 130, 133, 165, 168, 177, 1
THE SUITABLE NUMBERS OF EULER. REF BO1 427.

177 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 25, 27, 28, 30, 32, 35, 36, 40, 42, 45, 48, 49, 50, 54, 56, 60, 63, 64, 70, 72, 75, 80, 81, 84, 90, 96, 98, 100, 105, 10
CONTAIN NO PRIME FACTOR GREATER THAN 7.

178 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 22, 33, 44, 55, 66, 77, 88, 99, 101, 111, 121, 131, 141, 151, 161, 171, 181, 191, 202, 212, 222, 232, 242, 252, 262, 272, 282, 292, 303, 313, 32
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179 1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 14, 16, 17, 20, 21, 22, 25, 27, 29, 31, 32, 36, 39, 4 42, 45, 46, 47, 49, 51, 54, 55, 56, 57, 60, 61, 65, 66, 67, 69, 71, 77, 84, 86, 87, 90, 94
N(N − 1) − 1 IS PRIME. REF PO1 249. LE1 46.

180 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 14, 15, 16, 18, 20, 21, 22, 23, 24, 26, 27, 28, 29, 3 32, 33, 35, 36, 39, 40, 41, 42, 44, 46, 48, 50, 51, 52, 53, 54, 55, 56, 58, 60, 63, 64, 65
VALUES OF EULER TOTIENT FUNCTION. REF BA2 64 (DIVIDED BY 2).

181 1, 2, 3, 4, 5, 6, 8, 9, 14, 15, 16, 22, 28, 29, 36, 37, 54, 59, 85, 93, 117, 119, 161, 189, 193, 256, 308, 322, 327, 411, 466, 577, 591, 902, 928, 946
45.2N − 1 IS PRIME. REF MTAC 23 874 69.**

182 1, 2, 3, 4, 5, 6, 8, 10, 11, 13, 16, 18, 20, 23, 26, 29, 32, 35, 39, 43, 46, 50, 55, 59, 63, 68, 73, 78, 83, 88, 94, 100, 105, 111, 118, 124, 130, 137, 144, 151, 158, 165, 173, 1
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183 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 21, 22, 23, 24, 25, 26, 29, 30, 3 32, 33, 35, 37, 38, 40, 42, 43, 44, 45, 46, 47, 49, 51, 52, 53, 54, 56, 57, 58, 60, 63, 64
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184 1, 2, 3, 4, 5, 7, 8, 9, 10, 12, 13, 14, 15
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185 1, 2, 3, 4, 5, 7, 8, 9, 11, 13, 16, 17, 19, 23, 25, 27, 29, 31, 32, 37, 41, 43, 47, 49, 53, 59, 61, 64, 67, 71, 73, 79, 81, 83, 89, 97, 101, 103, 107, 109, 113, 121, 125, 127, 128
PRIME POWERS. REF AS1 870.

186 1, 2, 3, 4, 5, 7, 8, 10, 12, 14, 16, 19, 21, 24, 27, 30, 33, 37, 40, 44, 48, 52, 56, 61, 65, 70, 75, 80, 85, 91, 96, 102, 108, 114, 120, 127, 133, 140, 147, 154, 161, 169, 176, 184
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187 1, 2, 3, 4, 5, 7, 9, 11, 13, 16, 17, 19, 23, 24, 25, 29, 30
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188 1, 2, 3, 4, 5, 7, 10, 11, 12, 14, 15, 18, 24, 25, 26, 28, 29, 31, 33, 35, 38, 39, 42, 43, 46, 49, 50, 53, 56, 59, 63, 64, 67, 68, 75, 81, 82, 87, 89, 91, 92, 94, 96, 106, 109, 120, 124
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189 1, 2, 3, 4, 6, 6, 10, 19, 27, 33, 39, 157, 183, 386, 664, 687, 969, 1281, 1332, 2917, 2993, 3376, 6002
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190 1, 2, 3, 4, 6, 6, 12, 15, 20, 30, 30, 60, 60, 84, 105, 140, 210, 210, 420, 420, 420, 420, 840, 840, 1260, 1260, 1540, 2310, 2520, 4620, 4620, 5460, 5460, 9240, 9240, 13860
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191 1, 2, 3, 4, 6, 6, 13, 10, 24, 22, 45, 30, 158, 74, 245, 368, 693, 522, 2637, 1610, 7341
NECKLACES. REF IJM 8 269 64.

192 1, 2, 3, 4, 6, 7, 8, 9, 11, 12, 13, 14, 16, 17, 18, 19, 21, 22, 23, 24, 25, 27, 28, 29, 30, 32, 33, 34, 35, 37, 38, 39, 40, 42, 43, 44, 45, 46, 48, 49, 50, 51, 53, 54, 55, 56, 58, 59
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193 1, 2, 3, 4, 6, 7, 9, 10, 12, 13, 14, 16, 17
WYTHOFF GAME. REF CMB 2 188 59.

194 1, 2, 3, 4, 6, 7, 9, 15, 22, 28, 30, 46, 60, 63, 127, 153, 172, 303, 471, 532, 865, 900, 1366, 2380, 3310, 4495, 6321, 7447, 10198, 11425, 21846, 24369, 27286, 28713
XN + X + 1 IS IRREDUCIBLE OVER GF(2). REF IC 16 502 70.**

195 1, 2, 3, 4, 6, 7, 11, 18, 34, 38, 43, 55, 64, 76, 94, 103, 143, 206, 216, 306, 324, 391, 458, 470, 827
3.2N − 1 IS PRIME. REF MTAC 23 874 69.**

196 1, 2, 3, 4, 6, 8, 9, 10, 12, 16, 18, 20, 24, 30, 32, 36, 40, 48, 60, 64, 72, 80, 84, 90, 96, 100, 108, 120, 128, 144, 160, 168, 180, 192, 200, 216, 224, 240, 256, 288, 320, 336
RELATED TO HIGHLY COMPOSITE NUMBERS. REF RAM 87.

197 1, 2, 3, 4, 6, 8, 9, 11, 12, 16, 17, 18, 19, 22, 24, 25, 27, 32, 33, 34, 36, 38, 41, 43, 44, 48, 49, 50
OF THE FORM X2 + 2Y**2. REF EUL (1) 1 421 11. LE1 59.**

198 1, 2, 3, 4, 6, 8, 9, 12, 15, 16, 21, 24, 24, 32, 36, 36, 45, 48, 48, 60, 66, 64, 75, 84, 81, 96, 105, 96, 120, 128, 120, 144, 144, 144, 171, 180, 168, 192, 210, 192, 231, 240, 216
DEGREES OF RATIONAL PORISMS. REF BU2 39 103 47.

199 1, 2, 3, 4, 6, 8, 10, 12, 15, 18, 21, 24, 28, 32, 36, 40, 45, 50
RESTRICTED PARTITIONS. REF CAY 2 277.

200 1, 2, 3, 4, 6, 8, 10, 12, 16, 18, 20, 24, 30, 36, 42, 48, 60, 72, 84, 90, 96, 108, 120, 144, 168, 180, 210, 216, 240, 288, 300, 336, 360, 420, 480, 504, 540, 600, 630, 660, 720
HIGHLY ABUNDANT NUMBERS. REF TAMS 56 467 44.

201 1, 2, 3, 4, 6, 8, 11, 13, 16, 18, 26, 28, 36, 38, 47, 48, 53, 57, 62, 69, 72, 77, 82, 87, 97, 99, 102, 106, 114, 126, 131, 138, 145, 148, 155, 175, 177, 180, 182, 189, 197, 206
A SELF-GENERATING SEQUENCE. REF UL1 IX. AT1 249.

202 1, 2, 3, 4, 6, 8, 13, 18, 30, 46, 78, 126, 224, 380, 687, 1224, 2250, 4112, 7685, 14310, 27012
NECKLACES. REF IJM 5 662 61.

203 1, 2, 3, 4, 6, 8, 14, 20, 36, 60, 108, 188, 352, 632, 1182, 2192, 4116, 7712, 14602, 27596, 52488, 99880, 190746, 364724, 699252, 1342184, 2581428, 4971068, 9587580
NECKLACES OF 2 COLORS. REF IJM 5 662 61. GO1 172.

204 1, 2, 3, 4, 6, 9, 12, 16, 22, 29, 38, 50, 64, 82, 105, 132, 166, 208, 258, 320, 395, 484, 592, 722, 876, 1060
COEFFICIENTS OF AN ELLIPTIC FUNCTION. REF CAY 9 128.

205 1, 2, 3, 4, 6, 9, 12, 18, 27, 36, 54, 81, 108, 162, 243, 324, 486, 729, 972, 1458, 2187, 2916, 4374, 6561, 8748, 13122, 19683, 26244, 39366, 59049, 78732, 118098
SUBGROUPS OF SYMMETRIC GROUP. REF CMB 8 627 65. JRM 4 168 71.

206 1, 2, 3, 4, 6, 9, 13, 19, 27, 38, 54, 77, 109, 154, 218, 309, 437, 618, 874, 1236, 1748, 2472, 3496, 4944, 6992, 9888, 13984, 19777, 27969, 39554, 55938, 79108, 11187
A NONLINEAR RECURRENCE. REF MMAG 43 143 70.

207 1, 2, 3, 4, 6, 9, 13, 19, 28, 41, 60, 88, 129, 189, 277, 406, 595, 872, 1278, 1873, 2745, 4023, 5896, 8641, 12664, 18560, 27201, 39865, 58425, 85626, 125491, 183916
A(N) = A(N − 1) + A(N − 3). REF LA3 13. FQ 2 225 64. JA2 91. MMAG 41 15 68.

208 1, 2, 3, 4, 6, 9, 14, 22, 35, 56, 90, 145, 234, 378, 611, 988, 1598, 2585, 4182, 6766, 10947, 17712, 28658, 46369, 75026, 121394, 196419, 317812, 514230, 832041
RESTRICTED PERMUTATIONS. REF CMB 4 32 61 (DIVIDED BY 3).

209 1, 2, 3, 4, 6, 9, 14, 23, 38
PAIRWISE PRIME POLYNOMIALS. REF IC 13 615 68.

210 1, 2, 3, 4, 6, 12, 15, 20, 30, 60, 84, 105, 140, 210, 420, 840, 1260, 1540, 2310, 2520, 4620, 5460, 9240, 13860, 16380, 27720, 30030, 32760, 60060, 120120, 180180
LARGEST ORDER OF PERMUTATION OF N SYMBOLS. REF BSMF 97 187 69.

211 1, 2, 3, 4, 6, 16, 16, 30
POINT-SYMMETRIC TOURNAMENTS. REF CMB 13 322 70.

212 1, 2, 3, 4, 7, 13, 24, 44, 83, 157, 297, 567, 1085, 2086, 4019, 7766, 15039, 29181, 56717, 110408, 215225, 420076, 820836, 1605587, 3143562, 6160098, 12080946
LANDAUS APPROXIMATION. REF MTAC 18 79 64.

213 1, 2, 3, 4, 8, 10, 12, 19, 37, 54, 65, 77, 314, 366, 770, 1327, 1373, 1937, 2561, 2663, 5834, 5985, 6751, 12003
SIZE OF EVEN PERFECT NUMBERS. REF BE3 19. NAMS 18 608 71.

214 1, 2, 3, 4, 9, 27, 512, 134217728, (NEXT TERM HAS 155 DIGITS)
AN EXPONENTIAL FUNCTION ON PARTITIONS. REF AMM 76 830 69.

'15 1, 2, 3, 4, 11, 17, 29, 49, 85, 144
. PARTITION FUNCTION. REF JNSM 9 103 69.

'16 1, 2, 3, 4, 40, 210, 1477, 11672, 104256, 1036050
ROM MENAGE POLYNOMIALS. REF R1 197.

?17 1, 2, 3, 5, 1, 13, 7, 17, 11, 89, 1, 233, 29, 61, 47, 1597, 19, 4181, 41
'RIMITIVE DIVISORS OF FIBONACCI NUMBERS. REF FQ 1(3) 15 63.

?18 1, 2, 3, 5, 4, 7, 6, 9, 13, 8, 10, 19, 14, 12, 29, 16, 21, 22, 37, 18, 27, 20, 43, 33, 34,
8, 49, 24, 61, 32, 67, 30, 73, 45, 57, 44, 40, 36, 50, 42, 52, 101, 63, 85, 109, 91, 74, 54
NVERSE OF A DIVISOR FUNCTION. REF BA2 85.

?19 1, 2, 3, 5, 5, 7, 7, 7, 11, 9, 9, 11, 13, 11, 11, 15, 13, 13, 13, 17, 15, 19, 15, 19, 17,
:1, 17, 19, 17, 17, 19, 21, 25, 19, 19, 23, 25, 23, 21, 23, 21, 21, 29, 23, 25, 23, 27, 29, 23
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

?20 1, 2, 3, 5, 6, 5, 8, 9, 11, 10, 7, 15, 15, 14, 17, 24, 24, 21, 13, 19, 27, 25, 29, 26, 44,
·4, 29, 46, 39, 46, 27, 42, 47, 47, 54, 35, 41, 60, 51, 37, 48, 45, 49, 50, 49, 53
IUMBERS WITH INTEGRAL HARMONIC MEAN. REF AMM 61 95 54.

?21 1, 2, 3, 5, 6, 6, 6, 7, 8, 10, 13, 13, 13, 14, 17, 17, 17, 18, 19, 20, 22, 23, 27, 29, 29,
:9, 31, 32, 35, 36, 37, 40, 43, 46, 48, 50, 53, 55, 57, 60, 60, 61, 63, 66, 66, 68, 71, 74, 77
.ATTICE POINTS IN CIRCLES. REF MTAC 20 306 66.

?22 1, 2, 3, 5, 6, 7, 2, 10, 11, 3, 13, 14, 15, 17, 2, 19, 5, 21, 22, 23, 6, 26, 3, 7, 29, 30,
}1, 2, 33, 34, 35, 37, 38, 39, 10, 41, 42, 43, 11, 5, 46, 47, 3, 2, 51, 13, 53, 6, 55, 14, 57, 58
REMOVE SQUARES FROM N. REF NCM 4 168 1878.

?23 1, 2, 3, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28,
:9, 30, 31, 32, 33, 34, 35, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 50, 51, 52, 53, 54
IO SQUARES. REF HO2 97.

?24 1, 2, 3, 5, 6, 7, 8, 10, 11, 13, 14, 15, 17, 19, 21, 22, 23, 24, 26, 27, 29, 30, 31, 32,
}3, 34, 35, 37, 38, 39, 40, 41, 42, 43, 46, 47, 51, 53, 54, 55, 56, 57, 58, 59, 61, 62, 65, 66
:ONTAIN ODD POWERS ONLY. REF AMM 73 139 66.

?25 1, 2, 3, 5, 6, 7, 9, 10, 11, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 26, 27, 28, 29, 31,
}2, 33, 35, 36, 37, 39, 40, 41, 42, 44, 45, 46, 48, 49, 50, 52, 53, 54, 56, 57, 58, 59, 61, 62
\ BEATTY SEQUENCE. REF CMB 2 188 59.

?26 1, 2, 3, 5, 6, 7, 19, 21, 23, 31, 37, 38, 44, 69, 73
.EAST POSITIVE PRIMITIVE ROOTS. REF RS5 XLIV.

?27 1, 2, 3, 5, 6, 8, 10, 13, 15, 18, 21, 25, 28, 32, 36, 41, 45, 50
RESTRICTED PARTITIONS. REF CAY 2 277.

?28 1, 2, 3, 5, 6, 8, 12, 14, 15, 17, 20, 21, 24, 27, 33, 38, 41, 50, 54, 57, 59, 62, 66, 69,
'1, 75, 77, 78, 80, 89, 90, 99, 101, 105, 110, 111, 117, 119, 131, 138, 141, 143, 147, 150
N(N + 1) + 1 IS PRIME. REF CU1 1 245. LIN 3 209 29. LE1 46.

?29 1, 2, 3, 5, 6, 9, 11, 15, 18, 23, 27, 34, 39, 47, 54, 64, 72, 84, 94, 108, 120, 136, 150,
169, 185, 206, 225, 249, 270, 297, 321, 351, 378, 411, 441, 478, 511, 551, 588, 632, 672
PARTITIONS INTO AT MOST 4 PARTS. REF RS2 2.

230 1, 2, 3, 5, 6, 10, 11, 17, 21, 27, 33, 46, 53, 68, 82, 104, 123, 154, 179, 221, 262,
314, 369, 446, 515, 614, 715, 845, 977, 1148, 1321, 1544, 1778, 2060, 2361, 2736, 3121
MOCK THETA NUMBERS. REF TAMS 72 495 52.

231 1, 2, 3, 5, 7, 8, 9, 13, 14, 18, 19, 24, 25, 29, 30, 35, 36, 40, 41, 46, 51, 56, 63, 68,
72, 73, 78, 79, 83, 84, 89, 94, 115, 117, 126, 153, 160, 165, 169, 170, 175, 176, 181, 186
A SELF-GENERATING SEQUENCE. REF UL1 IX.

232 1, 2, 3, 5, 7, 8, 10, 12, 13, 18, 20, 27, 28, 33, 37, 42, 45, 47, 55, 58, 60, 62, 63, 65,
67, 73, 75, 78, 80, 85, 88, 90, 92, 102, 103, 105, 112, 115, 118, 120, 125, 128, 130, 132
(2N)2 + 1 IS PRIME. REF KR1 1 11.**

233 1, 2, 3, 5, 7, 9, 12, 15, 18, 22, 26, 30, 35, 40, 45, 51, 57, 63, 70, 77, 84, 92, 100,
108, 117, 126, 135, 145, 155, 165, 176, 187, 198, 210, 222, 234, 247, 260, 273, 287, 301
RELATED TO ZARANKIEWICZS PROBLEM. REF TI1 126 (DIVIDED BY 2).

234 1, 2, 3, 5, 7, 10, 11, 13, 14, 18, 21, 22, 31, 42, 67, 70, 71, 73, 251, 370, 375, 389,
407
39.2N + 1 IS PRIME. REF PAMS 9 674 58.**

235 1, 2, 3, 5, 7, 10, 12, 17, 18, 23, 25, 30, 32, 33, 38, 40, 45, 47, 52, 58, 70, 72, 77, 87,
95, 100, 103, 107, 110, 135, 137, 138, 143, 147, 170, 172, 175, 177, 182, 192, 205, 213
6A − 1, 6A + 1 ARE TWIN PRIMES. REF LE3 69.

236 1, 2, 3, 5, 7, 10, 13, 18, 23, 30, 37, 47, 57, 70, 83, 101, 119, 142, 165, 195, 225,
262, 299, 346, 393, 450, 507, 577, 647, 730, 813, 914, 1015, 1134, 1253, 1395, 1537
A LINEAR RECURRENCE. REF FQ 9 135 71.

237 1, 2, 3, 5, 7, 10, 13, 18, 23, 30, 37, 47, 57, 70, 84, 101, 119, 141, 164, 192, 221,
255, 291, 333, 377, 427, 480, 540, 603, 674, 748, 831, 918, 1014, 1115, 1226, 1342, 1469
PARTITIONS INTO AT MOST 5 PARTS. REF RS2 2.

238 1, 2, 3, 5, 7, 10, 14, 19, 26, 35, 47, 62, 82, 107, 139, 179, 230, 293
PLANAR PARTITIONS. REF PCPS 47 686 51.

239 1, 2, 3, 5, 7, 10, 14, 20, 27, 37, 49, 66, 86, 113, 146, 190, 242, 310, 392, 497, 623,
782, 973, 1212, 1498, 1851, 2274, 2793, 3411, 4163, 5059, 6142, 7427, 8972, 10801
REPRESENTATIONS OF THE SYMMETRIC GROUP. REF CJM 4 383 52.

240 1, 2, 3, 5, 7, 10, 14, 20, 29, 43, 65, 100, 156, 246, 391, 625, 1003, 1614, 2602,
4200, 6785, 10967, 17733, 28680, 46392, 75050, 121419, 196445, 317839, 514258
NTH FIBONACCI NUMBER + N. REF HO2 96.

241 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83,
89, 97, 101, 103, 107, 109, 113, 127, 131, 137, 139, 149, 151, 157, 163, 167, 173, 179
PRIMES. REF AS1 870.

242 1, 2, 3, 5, 7, 11, 13, 17, 19, 31, 37, 41, 61, 73, 97, 101, 109, 151, 163, 181, 193,
241, 251, 257, 271, 401, 433, 487, 541, 577, 601, 641, 751, 769, 811, 1153, 1201, 1297
A RESTRICTED CLASS OF PRIMES. REF KR1 1 53.

243 1, 2, 3, 5, 7, 11, 14, 20, 26, 35, 44, 58, 71, 90, 110, 136, 163, 199, 235, 282, 331,
391, 454, 532, 612, 709, 811, 931, 1057, 1206, 1360, 1540, 1729, 1945, 2172, 2432
PARTITIONS INTO AT MOST 6 PARTS. REF CAY 10 415. RS2 2.

244 1, 2, 3, 5, 7, 11, 15, 22, 30, 42, 56, 77, 101, 135, 176, 231, 297, 385, 490, 627, 792, 1002, 1255, 1575, 1958, 2436, 3010, 3718, 4565, 5604, 6842, 8349, 10143, 12310, 14883
NUMBER OF PARTITIONS OF N. REF RS2 90. R1 122. AS1 836.

245 1, 2, 3, 5, 7, 11, 17, 25, 38, 57, 86, 129, 194, 291, 437, 656, 985, 1477, 2216, 3325, 4987, 7481, 11222, 16834, 25251, 37876, 56815, 85222, 127834, 191751, 287626
QUOTIENT OF 3N / 2**N. REF JIMS 2 40 36. LE1 82.**

246 1, 2, 3, 5, 7, 11, 19, 43, 53, 79, 107, 149
LEAST POSITIVE PRIME PRIMITIVE ROOTS. REF RS5 XLV.

247 1, 2, 3, 5, 7, 11, 101, 131, 151, 181, 191, 313, 353, 373, 383, 727, 757, 787, 797, 919, 929, 10301, 10501, 10601, 11311, 11411, 12421, 12721, 12821, 13331, 13831
PALINDROMIC PRIMES. REF BE3 228.

248 1, 2, 3, 5, 7, 13, 17, 19, 31, 61, 89, 107, 127, 521, 607, 1279, 2203, 2281, 3217, 4253, 4423, 9689, 9941, 11213, 19937
MERSENNE PRIMES. REF MTAC 18 93 64. NAMS 18 608 71.

249 1, 2, 3, 5, 7, 13, 20, 35, 55, 96, 156, 267, 433, 747, 1239, 2089, 3498, 5912
PARAFFINS. REF JACS 54 1544 32.

250 1, 2, 3, 5, 7, 17, 31, 89, 127, 521, 607, 1279, 2281, 3217, 4423, 9689
IRREDUCIBLE MERSENNE TRINOMIALS. REF IC 15 68 69.

251 1, 2, 3, 5, 8, 9, 10, 11, 12, 18, 19, 22, 26, 28, 30, 31, 33, 35, 36, 38, 39, 40, 41, 44, 46, 47, 48, 50, 52, 54, 55, 56, 58, 61, 62, 66, 67, 68, 69, 71, 72, 74, 76, 77, 80, 82, 83, 91
ELLIPTIC CURVES. REF JRAM 212 23 63.

252 1, 2, 3, 5, 8, 11, 12, 14, 18, 20, 21, 27, 29, 30, 32, 35, 44, 45, 48, 50
OF THE FORM 2X2 + 3Y**2. REF EUL (1) 1 425 11.**

253 1, 2, 3, 5, 8, 12, 18, 26, 38, 53, 75, 103, 142, 192, 260, 346, 461, 605, 796
PLANAR PARTITIONS. REF PCPS 47 686 51.

254 1, 2, 3, 5, 8, 13, 17, 26, 34, 45, 54, 67, 81, 97, 115, 132, 153, 171, 198, 228, 256, 288, 323, 357, 400, 439, 488, 530, 581, 627, 681, 732, 790, 843, 908, 963, 1029, 1085
A SELF-GENERATING SEQUENCE. REF AMM 75 80 68. RLG.

255 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 232, 375, 606, 979, 1582, 2556, 4130, 6673, 10782, 17421, 28148, 45480, 73484, 118732, 191841, 309967, 500829, 809214, 1307487
DYING RABBITS. REF FQ 2 108 64.

256 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610, 987, 1597, 2584, 4181, 6765, 10946, 17711, 28657, 46368, 75025, 121393, 196418, 317811, 514229, 832040, 1346269
FIBONACCI NUMBERS A(N) = A(N − 1) + A(N − 2). REF HW1 148. REC 11 20 62. HO1.

257 1, 2, 3, 5, 8, 14, 21, 39, 62, 112, 189, 352, 607, 1144, 2055, 3883, 7154, 13602
NECKLACES. REF IJM 5 663 61.

258 1, 2, 3, 5, 8, 14, 23, 39, 65, 110, 184, 310, 520, 876, 1471, 2475, 4159, 6996, 11759
PARAFFINS. REF JACS 54 1105 32.

259 1, 2, 3, 5, 8, 15, 26, 48, 87, 161, 299, 563, 1066, 2030, 3885, 7464, 14384, 27779, 53782, 104359, 202838, 394860, 769777, 1502603, 2936519, 5744932
POPULATION OF U2 − 2V**2. REF MTAC 20 560 66.**

260 1, 2, 3, 5, 8, 21, 29, 79, 661, 740, 19161, 19901, 118666, 138567, 3167140, 3305707, 29612796, 32918503, 62531299, 595700194, 658231493, 1253931687
CONVERGENTS TO FIFTH ROOT OF 5. REF AMP 46 116 1866. LE1 67. HPR.

261 1, 2, 3, 5, 9, 16, 28, 50, 89, 159, 285, 510, 914, 1639, 2938, 5269, 9451, 16952, 30410, 54555, 97871, 175586, 315016, 565168, 1013976, 1819198, 3263875, 5855833
PARTITIONS INTO POWERS OF 1/2. REF EMS 11 224 59. ST3.

262 1, 2, 3, 5, 9, 16, 28, 51, 93, 170, 315, 585, 1091, 2048, 3855, 7280, 13797, 26214
NECKLACES. REF IJM 5 663 61. ME1.

263 1, 2, 3, 5, 9, 16, 29, 52, 94, 175, 327, 616, 1169, 2231, 4273, 8215, 15832, 30628, 59345, 115208, 224040, 436343, 850981, 1661663, 3248231, 6356076, 12448925
RAMANUJANS APPROXIMATION. REF MTAC 18 79 64.

264 1, 2, 3, 5, 9, 16, 29, 53, 98, 181, 341, 640, 1218, 2321, 4449, 8546, 16482, 31845, 61707, 119760, 232865, 453511, 884493, 1727125, 3376376, 6607207
POPULATION OF 3U2 + 4V**2. REF MTAC 20 567 66.**

265 1, 2, 3, 5, 9, 16, 29, 54, 97, 180, 337, 633, 1197, 2280, 4357, 8363, 16096, 31064, 60108, 116555, 226419, 440616, 858696, 1675603, 3273643, 6402706, 12534812
POPULATION OF U2 + V**2. REF MTAC 20 560 66.**

266 1, 2, 3, 5, 9, 17, 33, 65, 129, 257, 513, 1025, 2049, 4097, 8193, 16385, 32769, 65537, 131073, 262145, 524289, 1048577, 2097153, 4194305, 8388609, 16777217
2N + 1. REF BA1.**

267 1, 2, 3, 5, 9, 18, 35, 75, 159, 355, 802, 1858, 4347, 10359, 24894, 60523, 148284, 366319, 910726, 2278658, 5731580, 14490245, 93839412, 240215803, 617105614
PARAFFINS. REF JACS 54 2919 32.

268 1, 2, 3, 5, 9, 18, 35, 75, 159, 357, 799
HYDROCARBONS. REF BS1 201.

269 1, 2, 3, 5, 10, 11, 26, 32, 39, 92, 116, 134, 170, 224
25.4N + 1 IS PRIME. REF PAMS 9 674 58.**

270 1, 2, 3, 5, 10, 18, 35, 63, 126, 231
FROM RADONS THEOREM. REF MFM 73 12 69.

271 1, 2, 3, 5, 10, 24, 69, 384
LINEAR SPACES. REF BSM 19 424 67.

272 1, 2, 3, 5, 10, 27, 119, 1113, 29375, 2730166
THRESHOLD FUNCTIONS. REF PGEC 19 821 70.

273 1, 2, 3, 5, 11, 16, 38, 54, 130, 184, 444, 628, 1516, 2144, 5176, 7320, 17672, 24992, 60336, 85328, 206000, 291328, 703328, 994656, 2401312, 3395968, 8198592
A LINEAR RECURRENCE. REF AMM 72 1024 65.

274 1, 2, 3, 5, 11, 24, 55, 136, 345, 900, 2412, 6563, 18122, 50699, 143255, 408419, 1172854, 3395964
PARAFFINS. REF JACS 54 1544 32.

275 1, 2, 3, 5, 11, 47, 923, 409619, 83763206255, 35081259062908587981 71, 61534736870965787584485228092750775204331 67
HAMILTON NUMBERS. REF RS3 178 288 1887. LU1 496.

276 1, 2, 3, 5, 12, 14, 11, 13, 20, 72, 19, 42, 132, 84, 114, 29, 30, 110, 156, 37, 156, 420, 210, 156, 552, 462, 72, 53, 420, 342, 59
SHUFFLING CARDS. REF SIAMR 3 296 61.

277 1, 2, 3, 5, 12, 36, 110, 326, 963, 2964, 9797, 34818, 130585, 506996, 2018454, 8238737, 34627390, 150485325, 677033911, 3147372610, 15066340824, 74025698886
FROM A DIFFERENTIAL EQUATION. REF AMM 67 766 60.

278 1, 2, 3, 5, 13, 83, 2503, 976253, 31601312113, 2560404986164794683, 202523113189037952478722304798003
FROM A CONTINUED FRACTION. REF AMM 63 711 56.

279 1, 2, 3, 5, 16, 231, 53105, 2820087664, 7952894429824835871, 63248529811938901240357985099443351745
A(N) = A(N - 1)**2 - A(N - 2)**2. REF EUR 27 6 64.

280 1, 2, 3, 6, 2, 0, 1, 10, 0, 2, 10, 6, 7, 14, 0, 10, 12, 0, 6, 0, 9, 4, 10, 0, 18, 2, 0, 6, 14, 18, 11, 12, 0, 0, 22, 0, 20, 14, 6, 22, 0, 0, 23, 26, 0, 18, 4, 0, 14, 2, 0, 20, 0, 0, 0, 12, 3, 30
GLAISHERS CHI FUNCTION. REF QJM 20 151 1884.

281 1, 2, 3, 6, 5, 11, 14, 22, 30, 47, 66, 99, 143, 212, 308, 454, 663, 974, 1425, 2091, 3062, 4490, 6578, 9643, 14130, 20711, 30351, 44484, 65192, 95546, 140027, 205222
A(N) = A(N - 2) + A(N - 3) + A(N - 4). REF IDM 8 64 01. FQ 6(3) 68 68.

282 1, 2, 3, 6, 7, 10, 14, 15, 21, 30, 35, 42, 70, 105, 210, 221, 230, 231, 238, 247, 253, 255, 266, 273, 285, 286, 299, 322, 323, 330, 345, 357, 374, 385, 390, 391, 399, 418, 429
A SPECIALLY CONSTRUCTED SEQUENCE. REF AMM 74 874 67.

283 1, 2, 3, 6, 7, 11, 14, 17, 33, 42, 43, 63, 65, 67, 81, 134, 162, 206, 211, 366
9.2**N + 1 IS PRIME. REF PAMS 9 674 58.

284 1, 2, 3, 6, 8, 10, 22, 35, 42, 43, 46, 56, 91, 102, 106, 142, 190, 208, 266, 330, 360, 382, 462, 503, 815
33.2**N - 1 IS PRIME. REF MTAC 23 874 69.

285 1, 2, 3, 6, 8, 16, 24, 42, 69, 124, 208, 378, 668, 1214, 2220, 4110, 7630, 14308, 26931
NECKLACES. REF IJM 5 663 61.

286 1, 2, 3, 6, 9, 14, 20, 29, 42, 58, 79, 108, 145, 191, 252, 329, 427, 549, 704, 894, 1136, 1427, 1793, 2237, 2789, 3450, 4268, 5248, 6447, 7880, 9619, 11691, 14199
MIXED PARTITIONS. REF JNSM 9 91 69.

287 1, 2, 3, 6, 9, 18, 30, 56, 99, 186, 335, 630, 1161, 2182, 4080, 7710, 14532, 27594, 52377, 99858, 190557, 364722, 698870, 1342176, 2580795, 4971008, 9586395
IRREDUCIBLE POLYNOMIALS, OR NECKLACES. REF IJM 5 663 61. JSIAM 12 288 64.

288 1, 2, 3, 6, 9, 26, 53, 146, 369, 1002
NECKLACES. REF IJM 2 302 58.

289 1, 2, 3, 6, 10, 11, 21, 30, 48, 72, 110, 171, 260, 401, 613, 942, 1445, 2216, 3401, 5216, 8004, 12278, 18837, 28899, 44335, 68018, 104349, 160089, 245601, 376791
A FIELDER SEQUENCE. REF FQ 6(3) 68 68.

290 1, 2, 3, 6, 10, 17, 21, 38, 57, 92, 143, 225, 351, 555, 868, 1366, 2142, 3365, 5282, 8296, 13023, 20451, 32108, 50417, 79160, 124295, 195159, 306431, 481139, 755462
A FIELDER SEQUENCE. REF FQ 6(3) 68 68.

291 1, 2, 3, 6, 10, 17, 28, 46, 75, 122, 198, 321, 520, 842, 1363, 2206, 3570, 5777, 9348, 15126, 24475, 39602, 64078, 103681, 167760, 271442, 439203, 710646, 1149850
A(N) = A(N - 1) + A(N - 2) + 1. REF JA2 96.

292 1, 2, 3, 6, 10, 19, 35, 62, 118, 219, 414, 783, 1497, 2860, 5503, 10593, 20471, 39637, 76918, 149501, 291115, 567581, 1108022, 2165621, 4237085, 8297727
POPULATION OF U**2 + 4V**2. REF MTAC 18 84 64.

293 1, 2, 3, 6, 10, 19, 35, 67, 127, 248, 482, 952, 1885, 3765, 7546, 15221, 30802, 62620, 127702, 261335, 536278, 1103600, 2276499, 4706985, 9752585, 20247033
SERIES-REDUCED PLANTED TREES. AM1 101 150 59. CA3.

294 1, 2, 3, 6, 10, 20, 35, 70, 126, 252, 462, 924, 1716, 3432, 6435, 12870, 24310, 48620, 92378, 184756, 352716, 705432, 1352078, 2704156, 5200300, 10400600
CENTRAL BINOMIAL COEFFICIENTS C(N, N/2). REF RS1. AS1 828.

295 1, 2, 3, 6, 10, 20, 36, 72, 137, 274, 543
RESTRICTED HEXAGONAL POLYOMINOES. REF EMS 17 11 70.

296 1, 2, 3, 6, 11, 20, 37, 68, 125, 230, 423, 778, 1431, 2632, 4841, 8904, 16377, 30122, 55403, 101902, 187427, 344732, 634061, 1166220, 2145013, 3945294, 7256527
TRIBONACCI NUMBERS A(N) = A(N - 1) + A(N - 2) + A(N - 3). REF FQ 5 211 67.

297 1, 2, 3, 6, 11, 22, 42, 84, 165
RANDOM TOURNAMENTS. REF CMB 13 108 70.

298 1, 2, 3, 6, 11, 23, 46, 98, 207, 451, 983, 2179, 4850, 10905, 24631, 56011, 127912, 293547, 676157, 1563372, 3626149, 8436379, 19680277, 46026618
WEDDERBURN-ETHERINGTON NUMBERS. REF CO1 1 68.

299 1, 2, 3, 6, 11, 23, 47, 106, 235, 551, 1301, 3159, 7741, 19320, 48629, 123867, 317955, 823065, 2144505, 5623756, 14828074, 39299897, 104636890, 279793450
UNLABELED TREES. REF R1 138. HA5 232.

300 1, 2, 3, 6, 11, 24, 47, 103, 214, 481, 1030, 2337, 5131, 11813, 26329, 60958, 137821, 321690, 734428, 1721998, 3966556, 9352353, 21683445, 51296030, 119663812
STRUCTURE OF RAYLEIGH POLYNOMIAL. REF DMJ 31 517 64.

301 1, 2, 3, 6, 12, 23, 44, 85, 164, 316, 609, 1174, 2263, 4362, 8408, 16207, 31240, 60217, 116072, 223736, 431265, 831290, 1602363, 3088654, 5953572, 11475879
TETRANACCI NUMBERS. REF FQ 8 7 70.

302 1, 2, 3, 6, 12, 26, 59, 146, 368
SERIES-PARALLEL NUMBERS. REF ICM 1 646 50.

303 1, 2, 3, 6, 13, 28, 62
ALKYLS. REF ZFK 93 437 36.

304 1, 2, 3, 6, 13, 35, 116
CONNECTED WEIGHTED LINEAR SPACES. REF BSM 22 234 70.

305 1, 2, 3, 6, 14, 36, 94, 250, 675, 1838, 5053, 14016, 39169, 110194, 311751, 886160, 2529260
FIXED TRIANGULAR POLYOMINOES. REF LU5.

306 1, 2, 3, 6, 15, 63, 567, 14755, 1366318
THRESHOLD FUNCTIONS. REF PGEC 19 821 70.

07 1, 2, 3, 6, 18, 206, 7888299
OOLEAN FUNCTIONS. REF JSIAM 12 294 64.

08 1, 2, 3, 6, 20, 150, 3287, 244158, 66291591, 68863243522
HRESHOLD FUNCTIONS. REF PGEC 19 821 70.

09 1, 2, 3, 6, 20, 168, 7581, 7828354, 2414682040998
IONOTONE BOOLEAN FUNCTIONS, OR DEDEKINDS PROBLEM. REF HA2 188. BI1 63. CO1 2 16. WE1 181.

10 1, 2, 3, 6, 22, 402, 1228158, 400507806843728
OOLEAN FUNCTIONS. REF JSIAM 11 827 63.

11 1, 2, 3, 6, 30, 75, 81
.2N − 1 IS PRIME. REF MTAC 23 875 69.**

12 1, 2, 3, 7, 5, 11, 103, 71, 661, 269, 329891, 39916801, 2834329, 75024347, 790360487, 46271341, 1059511, 1000357, 123610951, 1713311273363831
ARGEST FACTOR OF FACTORIAL (N) + 1. REF SMA 14 25 48.

13 1, 2, 3, 7, 8, 10, 16, 18, 19, 40, 48, 55, 90, 96, 98, 190, 398, 456, 502
7.2N + 1 IS PRIME. REF PAMS 9 675 58.**

14 1, 2, 3, 7, 10, 13, 18, 27, 37, 51, 74, 157, 271, 458, 530, 891
1.2N − 1 IS PRIME. REF MTAC 23 874 69.**

15 1, 2, 3, 7, 10, 13, 25, 26, 46, 60, 87, 90, 95, 145, 160, 195, 216, 308, 415
.4N + 1 IS PRIME. REF PAMS 9 674 58.**

16 1, 2, 3, 7, 12, 27, 55, 127, 284, 682
ENTERED TREES. REF CAY 9 438.

17 1, 2, 3, 7, 13, 31, 65, 154, 347, 824, 1905, 4512, 10546, 24935, 58476, 138002, 23894, 763172, 1790585, 4213061, 9878541
QUARE FILAMENTS. REF PL2 1 337 70.

18 1, 2, 3, 7, 14, 32, 72, 171, 405, 989, 2426, 6045, 15167, 38422, 97925, 251275, 48061, 1679869, 4372872, 11428365, 29972078, 78859809, 208094977, 550603722
YDROCARBONS. REF JACS 55 253 33.

19 1, 2, 3, 7, 15, 34, 78, 182, 429, 1019, 2433, 5830, 14004, 33694, 81159, 195635, 71819, 1138286, 2746794, 6629290, 16001193, 38624911, 93240069, 225087338
UM OF FIBONACCI AND PELL NUMBERS.

20 1, 2, 3, 7, 15, 43, 131, 468, 1776, 7559, 34022, 166749, 853823, 4682358
EFINEMENTS OF PARTITIONS. REF GU5.

21 1, 2, 3, 7, 16, 54
IFFERENT GRAPHS, ALLOWING COMPLEMENTATION. REF KNAW 69 339 66.

22 1, 2, 3, 7, 18, 41, 123, 367
LTERNATING KNOTS. REF TA1 1 345. JL2 343.

23 1, 2, 3, 7, 21, 49, 166, 549
LTERNATING AND NONALTERNATING KNOTS. REF TA1 1 345. JL2 343.

24 1, 2, 3, 7, 21, 135, 2470, 175428
HRESHOLD FUNCTIONS. REF PGEC 19 821 70.

325 1, 2, 3, 7, 23, 41, 71, 191, 409, 2161, 5881, 36721, 55441, 71761, 110881, 760321
LEAST POSITIVE PRIMITIVE ROOTS. REF RS5 XLIV.

326 1, 2, 3, 7, 23, 43, 67, 83, 103, 127, 163, 167, 223, 227, 283, 367, 383, 443, 463, 467, 487, 503, 523, 547, 587, 607, 643, 647, 683, 727, 787, 823, 827, 863, 883, 887, 907
PRIMES DIVIDING ALL FIBONACCI SEQUENCES. REF FQ 2 38 64.

327 1, 2, 3, 7, 23, 89, 113, 523, 887, 1129, 1327, 9551, 15683, 19609, 31397, 155921, 360653, 370261, 492113, 1349533, 1357201, 2010733, 4652353, 17051707
INCREASING GAPS BETWEEN PRIMES. REF KR1 1 14. MTAC 18 649 64.

328 1, 2, 3, 7, 23, 164, 3779, 619779, 2342145005, 1451612289057674, 3399886472013047316638149, 4935316984175079105557291745555191750431
A(N) = A(N − 1)A(N − 2) + A(N − 3). REF GU5.

329 1, 2, 3, 7, 43, 13, 53, 5, 6221671, 38709183810571
FROM EUCLIDS PROOF. REF BAMS 69 737 63.

330 1, 2, 3, 7, 43, 139, 50207, 340999, 3202139, 410353
FROM EUCLIDS PROOF. REF NAMS 11 376 64.

331 1, 2, 3, 7, 43, 1807, 3263443, 10650056950807, 113423713055421844361000443, 12864938683278671740537145998360961546653259485195807
A(N + 1) = A(N)2 − A(N) + 1. REF CJM 15 475 63. AMM 70 403 63.**

332 1, 2, 3, 8, 10, 12, 14, 17, 23, 24, 27, 28, 37, 40, 41, 44, 45, 53, 59, 66, 70, 71, 77, 80, 82, 87, 90, 97, 99, 102, 105, 110, 114, 119, 121, 124, 127, 133, 136, 138, 139, 144
(2N)4 + 1 IS PRIME. REF MTAC 21 246 67.**

333 1, 2, 3, 8, 13, 20, 31, 32, 53, 76, 79, 80, 117, 176, 181, 182, 193, 200, 283, 284, 285, 286, 293, 440, 443, 468, 661, 678, 683, 684, 1075, 1076, 1087, 1088, 1091, 1092
RELATED TO LIOUVILLES FUNCTION. REF IAS 12 408 40.

334 1, 2, 3, 8, 18, 44, 115, 294, 783
RECTANGULAR POLYOMINOES. REF SPH 7 203 37.

335 1, 2, 3, 8, 19, 27, 100, 227, 781, 1008, 3805, 4813, 148195, 153008, 760227, 913235, 2586697, 24193508, 147747745, 615184488, 762932233, 1378116721
CONVERGENTS TO CUBE ROOT OF 4. REF AMP 46 106 1866. LE1 67. HPR.

336 1, 2, 3, 8, 24, 108, 640, 4492, 36336, 329900, 3326788
PATTERNS. REF MES 37 61 07.

337 1, 2, 3, 8, 30, 144, 840, 5760, 45360, 403200, 3991680, 43545600, 518918400, 6706022400, 93405312000, 1394852659200, 22230464256000, 376610217984000
SUMS OF FACTORIAL NUMBERS. REF CJM 22 26 70.

338 1, 2, 3, 8, 51, 1538, 599871, 19417825808, 1573273218577214751, 124442887685693556895657990772138
FROM A CONTINUED FRACTION. REF AMM 63 711 56.

339 1, 2, 3, 9, 20, 73
PARTITIONS OF A POLYGON. REF BAMS 54 359 48.

340 1, 2, 3, 10, 27, 98
SIGNED TREES. REF AM1 101 154 59.

341 1, 2, 3, 10, 1382, 420, 10851, 438670, 7333662, 51270780, 7090922730, 2155381956, 94997844116, 68926730208040
NUMERATORS OF BERNOULLI NUMBERS. REF DA2 2 208.

342 1, 2, 3, 11, 22, 26, 101, 111, 121, 202, 212, 264, 307, 836, 1001, 1111, 2002, 2285, 2636, 10001, 10101, 10201, 11011, 11111, 11211, 20002, 20102, 22865, 24846, 30693
SQUARE IS A PALINDROME. REF JRM 3 94 70.

343 1, 2, 3, 11, 69, 701, 10584, 222965, 6253604, 225352709, 10147125509, 558317255704, 36859086001973, 2875567025409598, 261713458398275391
A(N) = N(N − 1)A(N − 1)/2 + A(N − 2).

344 1, 2, 3, 12, 10, 60, 105, 280, 252, 2520, 2310, 27720, 25740, 24024, 45045, 720720, 680680, 12252240, 11639628, 11085360, 10581480, 232792560, 223092870
L. C. M. OF BINOMIAL COEFFICIENTS C(N, 1), C(N, 2), ..., C(N, N).

345 1, 2, 3, 12, 52, 456, 6873, 191532, 9733032, 903753248, 154108311046
NONTRANSITIVE PRIME TOURNAMENTS. REF DMJ 37 332 70.

346 1, 2, 3, 24, 5, 720, 105, 2240, 189, 3628800, 385, 479001600, 19305, 896896, 2027025, 20922789888000, 85085, 6402373705728000, 8729721, 47297536000
N-PHI-TORIAL. REF AMM 60 422 53.

347 1, 2, 3, 26, 13, 1074, 1457, 61802, 7929, 4218722
SUMS OF LOGARITHMIC NUMBERS. REF MST 31 78 63.

348 1, 2, 3, 56, 43265728
INVERTIBLE BOOLEAN FUNCTIONS. REF JSIAM 12 297 64.

SEQUENCES BEGINNING 1, 2, 4

349 1, 2, 4, 1, 3, 6, 5, 2, 8, 4, 10, 9, 1, 8, 5, 11, 12, 10, 2, 4, 9, 13, 6, 11, 8, 16, 5, 13, 17, 18, 15, 2, 4, 11, 6, 19, 17, 13, 16, 10, 1, 3, 20, 12, 22, 18, 17, 22, 23, 11, 2, 16, 19, 13, 8
QUADRATIC PARTITIONS OF PRIMES. REF CU2 1. LE1 55.

350 1, 2, 4, 3, 6, 10, 12, 4, 8, 18, 6, 11, 20, 18, 28, 5, 10, 12, 36, 12, 20, 14, 12, 23, 21, 8, 52, 20, 18, 58, 60, 6, 12, 66, 22, 35, 9, 20, 30, 39, 54, 82, 8, 28, 11, 12, 10, 36, 48, 30
EXPONENTS OF 2. REF MAG 4 266 08. MOD 10 226 61. SIAMR 3 296 61.

351 1, 2, 4, 4, 6, 8, 8, 8, 13, 12, 12, 16, 14, 16, 24, 16
GENERALIZED DIVISOR FUNCTION. REF PLMS 19 111 19.

352 1, 2, 4, 4, 6, 8, 8, 12, 14
GENERALIZED TANGENT NUMBERS. REF MTAC 21 690 67.

353 1, 2, 4, 4, 6, 16, 16, 30, 88
POINT-SYMMETRIC TOURNAMENTS. REF CMB 13 322 70.

354 1, 2, 4, 5, 6, 7, 8, 10, 11, 12, 13, 15
WYTHOFF GAME. REF CMB 2 189 59.

355 1, 2, 4, 5, 6, 8, 9, 11, 12, 13, 15, 16, 18, 19, 20, 22, 23, 25, 26, 27, 29, 30, 32, 33, 34, 36, 37, 38, 40, 41, 43, 44, 45, 47, 48, 50, 51, 52, 54, 55, 57, 58, 59, 61, 62, 64, 65, 66
A BEATTY SEQUENCE. REF CMB 3 21 60.

356 1, 2, 4, 5, 7, 8, 9, 11, 12, 14, 15, 16
A BEATTY SEQUENCE. REF CMB 2 188 59.

357 1, 2, 4, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 37, 38, 40, 41, 43, 44, 46, 47, 49, 50, 52, 53, 55, 56, 58, 59, 61, 62, 64, 65, 67, 68, 70,
SEMI-TRIBONACCI NUMBERS. REF FQ 6(3) 261 68.

358 1, 2, 4, 5, 7, 8, 11, 13, 16, 17, 19, 31, 37, 41, 47, 53, 61, 71, 79, 113, 313, 353
PRIME LUCAS NUMBERS. REF JA2 36. MTAC 23 213 69.

359 1, 2, 4, 5, 7, 9, 10, 12, 14, 16, 17, 19, 21, 23, 25, 26, 28, 30, 32, 34, 36, 37, 39, 4
43, 45, 47, 49, 50, 52, 54, 56, 58, 60, 62, 64, 65, 67, 69, 71, 73, 75, 77, 79, 81, 82, 84,
1 ODD, 2 EVEN, 3 ODD, ... REF AMM 67 380 60.

360 1, 2, 4, 5, 7, 9, 12, 13, 15, 17, 20, 22, 25, 28, 32, 33, 35, 37, 40, 42, 45, 48, 52, 5
57, 60, 64, 67, 71, 75, 80, 81, 83, 85, 88, 90, 93, 96, 100, 102, 105, 108, 112, 115, 119
NUMBER OF ONES IN BINARY EXPANSION OF FIRST N NUMBERS. REF SIAMR 4 21 62. C
8 481 65. ANY 175 177 70.

361 1, 2, 4, 5, 8, 9, 10, 13, 16, 17, 18, 20, 25, 26, 29, 32, 34, 36, 37, 40, 41, 45, 49, 5
52, 53, 58, 61, 64, 65, 68, 72, 73, 74, 80, 81, 82, 85, 89, 90, 97, 98, 100, 101, 104, 106
THE SUM OF 2 SQUARES. REF EUL (1) 1 417 11. KNAW 53 872 50.

362 1, 2, 4, 5, 8, 9, 12, 14, 17, 18, 23, 24, 27, 30, 34, 35, 40, 41, 46, 49, 52, 53, 60, 6
65, 68, 73, 74, 81, 82, 87, 90, 93, 96, 104, 105, 108, 111, 118, 119, 126, 127, 132, 137
A NUMBER-THEORETIC FUNCTION. REF DVSS 2 281 1884.

363 1, 2, 4, 5, 8, 10, 14, 15, 16, 21, 22, 25, 26, 28, 33, 34, 35, 36, 38, 40, 42, 46, 48, 50, 53, 57, 60, 62, 64, 65, 70, 77, 80, 81, 83, 85, 86, 90, 91, 92, 100
PRIME NUMBERS OF MEASUREMENT. REF PCPS 21 654 23.

364 1, 2, 4, 5, 8, 12, 19, 30, 48, 77, 124, 200, 323, 522, 844, 1365, 2208, 3572, 5779
9350, 15128, 24477, 39604, 64080, 103683, 167762, 271444, 439205, 710648, 11498
A(N) = A(N − 1) + A(N − 2) − 1. REF JA2 97.

365 1, 2, 4, 5, 10, 14, 17, 31, 41, 73, 80, 82, 116, 125, 145, 157, 172, 202, 224, 266, 289, 293, 463
15.2N − 1 IS PRIME. REF MTAC 23 874 69.**

366 1, 2, 4, 5, 10, 19, 36, 68, 138
BORON TREES. REF CAY 9 451.

367 1, 2, 4, 5, 14, 14, 39, 42, 132, 132, 424, 429, 1428, 1430, 4848, 4862, 16796, 16796, 58739, 58786, 208012, 208012, 742768, 742900, 2674426, 2674440, 9694416
DISSECTIONS OF A POLYGON. REF GU1.

368 1, 2, 4, 6, 3, 10, 25, 12, 42, 8, 40, 202, 21
FROM SEDLACEKS PROBLEM ON SOLUTIONS OF X + Y = Z. REF GU8.

369 1, 2, 4, 6, 7, 10, 11, 12, 22, 23, 25, 26, 27, 30, 36, 38, 42, 43, 44, 45, 50, 52, 54,
59, 70, 71, 72, 74, 75, 76, 78, 86, 87, 91, 102, 103, 106, 107, 108, 110, 116, 118, 119
ELLIPTIC CURVES. REF JRAM 212 25 63.

370 1, 2, 4, 6, 8, 10, 12, 16, 18, 20, 22, 24, 28, 30, 32, 36, 40, 42, 44, 46, 48, 52, 54, 5
58, 60, 64, 66, 70, 72, 78, 80, 82, 84, 88, 90, 92, 96, 100
VALUES OF REDUCED TOTIENT FUNCTION. REF NAM 17 305 1898. LE1 7.

71 1, 2, 4, 6, 8, 10, 12, 16, 18, 20, 22, 24, 28, 30, 32, 36, 40, 42, 44, 46, 48, 52, 54, 56,
, 60, 64, 66, 70, 72, 78, 80, 82, 84, 88, 92, 96, 100, 102, 104, 106, 108, 110, 112, 116
LUES OF EULER TOTIENT FUNCTION. REF BA2 64.

72 1, 2, 4, 6, 8, 12, 16, 24, 32, 36, 48, 64, 72, 96, 120, 128, 144, 192, 216, 240, 256,
8, 384, 432, 480, 512, 576, 720, 768, 864, 960, 1024, 1152, 1296, 1440, 1536, 1728
RDAN-POLYA NUMBERS. REF JCT 5 25 68.

73 1, 2, 4, 6, 8, 14, 26
IAKE-IN-THE-BOX PROBLEM. REF AMM 77 63 70.

74 1, 2, 4, 6, 9, 12, 16, 20, 25, 30, 36, 42, 49, 56, 64, 72, 81, 90, 100, 110, 121, 132,
4, 156, 169, 182, 196, 210, 225, 240, 256, 272, 289, 306, 324, 342, 361, 380, 400, 420
PARTITION FUNCTION. REF AMS 26 304 55.

75 1, 2, 4, 6, 9, 13, 18, 24, 31, 39, 50, 62, 77, 93, 112, 134, 159, 187, 252, 292
NUMERANTS. REF R1 152.

76 1, 2, 4, 6, 10, 12, 18, 22, 28, 32, 42, 46, 58, 64, 72, 80, 96, 102, 120, 128, 140, 150,
2, 180, 200, 212, 230, 242, 270, 278, 308, 324, 344, 360, 384, 396, 432, 450, 474, 490
IM OF TOTIENT FUNCTION. REF SY1 4 103. LE1 7.

77 1, 2, 4, 6, 10, 12, 18, 22, 30, 34, 42, 48, 58, 60, 78, 82, 102, 108, 118, 132, 150,
4, 174, 192, 210, 214, 240, 258, 274, 282, 322, 330, 360, 372, 402, 418, 442, 454, 498
NERATED BY A SIEVE. REF RLM 11 27 57.

78 1, 2, 4, 6, 10, 14, 20, 26, 36, 46, 60, 74, 94, 114, 140, 166, 202, 238, 284, 330, 390,
0, 524, 598, 692, 786, 900, 1014, 1154, 1294, 1460, 1626, 1828, 2030, 2268, 2506
IE BINARY PARTITION FUNCTION. REF FQ 4 117 66. PCPS 66 376 69. AT1 400.

79 1, 2, 4, 6, 10, 14, 21, 29, 41, 55, 76, 100, 134, 175, 230, 296, 384, 489, 626, 791,
01, 1254, 1574, 1957, 2435, 3009, 3717, 4564, 5603, 6841, 8348, 10142, 12309
IEES OF HEIGHT 2. REF IBMJ 4 475 60. KU1.

80 1, 2, 4, 6, 10, 14, 24, 30
ZE OF MINIMAL GRAPHS. REF SA1 94.

81 1, 2, 4, 6, 10, 16, 26, 44, 76, 132, 234, 420, 761, 1391, 2561, 4745, 8841, 16551,
114, 58708, 111136, 211000, 401650, 766372, 1465422, 2807599, 5388709, 10359735
IM OF (2N)/N**

82 1, 2, 4, 6, 10, 18, 33, 60, 111, 205, 385, 725, 1374, 2610, 4993, 9578, 18426,
568, 68806, 133411, 259145, 504222, 982538, 1917190, 3745385, 7324822
PULATION OF U2 + 2V**2. REF MTAC 20 560 66.**

83 1, 2, 4, 6, 11, 19, 33, 55, 95, 158, 267, 442, 731, 1193, 1947
ANAR PARTITIONS. REF MA2 2 332.

84 1, 2, 4, 6, 11, 19, 34, 63, 117, 218, 411, 780, 1487, 2849, 5477, 10555, 20419,
563, 76805, 149360, 290896, 567321, 1107775, 2165487, 4237384, 8299283
MANUJANS APPROXIMATION. REF MTAC 18 84 64.

85 1, 2, 4, 6, 12, 24, 36, 48, 60, 120, 180, 240, 360, 720, 840, 1260, 1680, 2520, 5040,
60, 10080, 15120, 20160, 25200, 27720, 45360, 50400, 55440, 83160, 110880, 166320
GHLY COMPOSITE NUMBERS. REF RAM 87.

386 1, 2, 4, 6, 16, 20, 24, 28, 34, 46, 48, 54, 56, 74, 80, 82, 88, 90, 106, 118, 132, 140,
142, 154, 160, 164, 174, 180, 194, 198, 204, 210, 220, 228, 238, 242, 248, 254, 266, 272
N4 + 1 IS PRIME. REF MTAC 21 246 67.**

387 1, 2, 4, 6, 16, 20, 36, 54, 60, 96, 124, 150, 252, 356, 460, 612, 654, 664, 698, 702,
972
17.2N − 1 IS PRIME. REF MTAC 22 421 68.**

388 1, 2, 4, 7, 8, 11, 13, 14, 16, 19, 21, 22, 25, 26, 28, 31, 32, 35, 37, 38, 41, 42, 44, 47,
49, 50, 52, 55, 56, 59, 61, 62, 64, 67, 69, 70, 73, 74, 76, 79, 81, 82, 84, 87, 88, 91, 93
ODD NUMBER OF ONES IN BINARY EXPANSION. REF CMB 2 86 59.

389 1, 2, 4, 7, 8, 12, 13, 17, 20, 26, 28, 35, 37, 44, 48, 57, 60, 70, 73, 83, 88, 100, 104,
117, 121, 134, 140, 155, 160, 176, 181, 197, 204, 222, 228, 247, 253, 272, 280, 301, 308
RELATED TO ZARANKIEWICZS PROBLEM. REF TI1 126.

390 1, 2, 4, 7, 11, 16, 21, 28, 35
RATIONAL POINTS IN A QUADRILATERAL. REF JRAM 226 22 67.

391 1, 2, 4, 7, 11, 16, 22, 29, 37, 46, 56, 67, 79, 92, 106, 121, 137, 154, 172, 191, 211,
232, 254, 277, 301, 326, 352, 379, 407, 436, 466, 497, 529, 562, 596, 631, 667, 704, 742
CENTRAL POLYGONAL NUMBERS N(N − 1)/2 + 1, OR SLICING A PANCAKE. REF MAG 30 150 46. HO3 22. FQ 3 296 65.

392 1, 2, 4, 7, 11, 16, 23, 31, 41, 53, 67, 83, 102, 123, 147, 174, 204, 237, 274, 314,
358, 406, 458, 514, 575, 640, 710, 785, 865, 950, 1041, 1137, 1239, 1347, 1461, 1581
A PARTITION FUNCTION. REF CAY 2 278. JACS 53 3084 31. AMS 26 304 55.

393 1, 2, 4, 7, 12, 8, 80, 84, 820
CYCLIC STEINER TRIPLE SYSTEMS. REF CSA 504.

394 1, 2, 4, 7, 12, 18, 27, 38, 53, 71, 94, 121, 155, 194, 241, 295, 359, 431, 515, 609,
717, 837, 973, 1123, 1292, 1477, 1683, 1908, 2157, 2427, 2724, 3045, 3396, 3774, 4185
A PARTITION FUNCTION. REF AMS 26 304 55.

395 1, 2, 4, 7, 12, 19, 29, 42, 60, 83, 113, 150, 197, 254, 324, 408, 509, 628, 769, 933,
1125, 1346, 1601, 1892, 2225, 2602, 3029, 3509, 4049, 4652, 5326, 6074, 6905, 7823
A PARTITION FUNCTION. REF AMS 26 304 55.

396 1, 2, 4, 7, 12, 19, 30, 45, 67, 97, 139, 195, 272, 373, 508, 684, 915, 1212, 1597,
2087, 2714, 3506, 4508, 5763, 7338, 9296, 11732, 14742, 18460, 23025, 28629, 35471
PARTITIONS INTO PARTS OF 2 KINDS. REF RS2 90. RCI 199. FQ 9 332 71.

397 1, 2, 4, 7, 12, 20, 33, 54, 88, 143, 232, 376, 609, 986, 1596, 2583, 4180, 6764,
10945, 17710, 28656, 46367, 75024, 121392, 196417, 317810, 514228, 832039, 1346268
FIBONACCI NUMBERS − 1. REF R1 155. AENS 79 203 62. FQ 3 295 65.

398 1, 2, 4, 7, 12, 21, 38, 68, 124, 229, 428, 806, 1530, 2919, 5591, 10750, 20717,
40077, 77653, 150752, 293161, 570963, 1113524, 2174315, 4250367, 8317036
RAMANUJANS INTEGRAL. REF MTAC 18 85 64.

399 1, 2, 4, 7, 12, 22, 39, 70, 126, 225, 404, 725
RESTRICTED PARTITIONS. REF EMS 11 224 59.

400 1, 2, 4, 7, 12, 22, 41, 72, 137, 254, 476, 901, 1716, 3274, 6286, 12090, 23331,
45140, 87511, 169972, 330752, 644499, 1257523, 2456736, 4804666, 9405749
POPULATION OF U2 + 4V**2. REF MTAC 20 560 66.**

401 1, 2, 4, 7, 13, 15, 18, 19, 20, 21, 22, 23, 25, 28, 29, 30, 35, 38, 40, 43, 44, 45, 48, 9, 50, 51, 54, 55, 56, 57, 58, 59, 60, 63, 65, 66, 71, 72, 74, 75, 79, 81, 84, 85, 87, 91, 93
LLIPTIC CURVES. REF JRAM 212 23 63.

402 1, 2, 4, 7, 13, 17, 30, 60, 107, 197, 257, 454, 908, 1619
JUMPING PROBLEM. REF DO1 259.

403 1, 2, 4, 7, 13, 22, 40, 70, 126, 225, 411, 746, 1376, 2537, 4719, 8799, 16509, 1041, 58635, 111012, 210870, 401427, 766149, 1465019, 2807195, 5387990, 10358998
RREDUCIBLE POLYNOMIALS, OR NECKLACES. REF JSIAM 12 288 64.

404 1, 2, 4, 7, 13, 24, 42, 76, 137, 245, 441
ESTRICTED PARTITIONS. REF EMS 11 224 59.

405 1, 2, 4, 7, 13, 24, 43, 78, 141, 253, 456
ESTRICTED PARTITIONS. REF EMS 11 224 59.

406 1, 2, 4, 7, 13, 24, 44, 81, 149, 274, 504, 927, 1705, 3136, 5768, 10609, 19513, 5890, 66012, 121415, 223317, 410744, 755476, 1389537, 2555757, 4700770, 8646064
RIBONACCI NUMBERS A(N) = A(N − 1) + A(N − 2) + A(N − 3). REF FQ 1(3) 71 63, 5 211 7.

407 1, 2, 4, 7, 13, 25, 43, 83, 157, 296, 564, 1083, 2077, 4006, 7733, 14968, 29044, 6447, 109864, 214197, 418080, 816907, 1598040, 3129063, 6132106
DD POPULATION OF U2 + V**2. REF MTAC 18 84 64.**

408 1, 2, 4, 7, 14, 23, 42, 76, 139, 258, 482, 907, 1717, 3269, 6257, 12020, 23171, 4762, 86683, 168233, 327053, 636837, 1241723, 2424228, 4738426
OPULATION OF 2U2 + 3V**2. REF MTAC 20 563 66.**

409 1, 2, 4, 7, 14, 24, 43, 82, 149, 284, 534, 1015, 1937, 3713, 7136, 13759, 26597, 1537, 100045, 194586, 378987, 739161, 1443465, 2821923, 5522689
OPULATION OF 4U2 + 4UV + 5V**2. REF MTAC 20 567 66.**

410 1, 2, 4, 7, 14, 27, 52, 100, 193, 372, 717, 1382, 2664, 5135, 9898, 19079, 36776, 0888, 136641, 263384, 507689, 978602, 1886316, 3635991, 7008598, 13509507
ETRANACCI NUMBERS. REF FQ 8 7 70.

411 1, 2, 4, 7, 14, 29, 60, 127, 275, 598, 1320, 2936
ORON TREES. REF CAY 9 450.

412 1, 2, 4, 7, 39, 202, 1219, 9468, 83425, 80017
RAPHS COMPOSED OF TWO CIRCUITS. REF RE4.

413 1, 2, 4, 8, 1, 6, 3, 2, 6, 4, 1, 2, 8, 2, 5, 6, 5, 1, 2, 1, 0, 2, 4, 2, 0, 4, 8, 4, 0, 9, 6, 8, 1, , 2, 1, 6, 3, 8, 4, 3, 2, 7, 6, 8, 6, 5, 5, 3, 6, 1, 3, 1, 0, 7, 2, 2, 6, 2, 1, 4, 4, 5, 2, 4, 2, 8, 8, 1
OWERS OF TWO. REF EUR 11 10 49.

414 1, 2, 4, 8, 7, 5, 10, 11, 13, 8, 7, 14, 19, 20, 22, 26, 25, 14, 19, 29, 31, 26, 25, 41, 37, 9, 40, 35, 43, 41, 37, 47, 58, 62, 61, 59, 64, 56, 67, 71, 61, 50, 46, 56, 58, 62, 70, 68
UMS OF DIGITS OF POWERS OF 2. REF EUR 26 12 63.

415 1, 2, 4, 8, 10, 12, 14, 18, 32, 48, 54, 72, 148, 184, 248, 270, 274, 420
2N − 1 IS PRIME. REF MTAC 22 421 68.**

416 1, 2, 4, 8, 13, 21, 31, 45, 60, 76, 97, 119, 144, 170, 198, 231, 265, 300, 336, 374, 414, 456, 502, 550, 599, 649, 702, 759, 819, 881, 945, 1010, 1080, 1157, 1237, 1318
A SELF-GENERATING SEQUENCE. REF AMM 75 80 68. RLG.

417 1, 2, 4, 8, 13, 24, 42, 76, 140, 257, 483, 907, 1717, 3272, 6261, 12027, 23172, 44769, 86708, 168245, 327073, 636849, 1241720, 2424290, 4738450
POPULATION OF U2 + 6V**2. REF MTAC 20 563 66.**

418 1, 2, 4, 8, 14, 18, 28, 40, 52, 70, 88, 104, 140
GENERALIZED DIVISOR FUNCTION. REF PLMS 19 111 19.

419 1, 2, 4, 8, 15, 26, 42, 64, 93, 130, 176, 232, 299, 378, 470, 576, 697, 834, 988, 1160, 1351, 1562, 1794, 2048, 2325, 2626, 2952, 3304, 3683, 4090, 4526, 4992, 5489
SLICING A CAKE. REF MAG 30 150 46. FQ 3 296 65.

420 1, 2, 4, 8, 15, 27, 47, 79, 130, 209, 330, 512, 784, 1183, 1765, 2604, 3804, 5504, 7898, 11240
PLANAR PARTITIONS. REF PCPS 47 686 51.

421 1, 2, 4, 8, 15, 27, 47, 80, 134, 222, 365, 597, 973, 1582, 2568, 4164, 6747, 10927, 17691, 28636, 46346, 75002, 121369, 196393, 317785, 514202, 832012, 1346240
A NONLINEAR BINOMIAL SUM. REF FQ 3 295 65.

422 1, 2, 4, 8, 15, 29, 53, 98, 177, 319, 565, 1001, 1749, 3047, 5264, 9054, 15467, 26320, 44532, 75054, 125904, 210413, 350215, 580901, 960035, 1581534, 2596913
TREES OF HEIGHT AT MOST 3. REF IBMJ 4 475 60. KU1.

423 1, 2, 4, 8, 15, 29, 56, 108, 208, 401, 773, 1490, 2872, 5536, 10671, 20569, 39648, 76424, 147312, 283953, 547337, 1055026, 2033628, 3919944, 7555935, 14564533
TETRANACCI NUMBERS. REF AMM 33 232 26. FQ 1(3) 74 63.

424 1, 2, 4, 8, 15, 240, 15120, 672, 8400, 100800, 69300, 4950, 17199000, 22422400, 33633600, 201801600, 467812800, 102918816000
COEFFICIENTS FOR NUMERICAL DIFFERENTIATION. REF PHM 33 11 42. BAMS 48 922 42.

425 1, 2, 4, 8, 16, 21, 42, 51, 102, 112, 224, 235, 470, 486, 972, 990, 1980, 2002, 4004, 4027, 8054, 8078, 16156, 16181, 32362, 32389, 64778, 64806, 129612, 129641, 259282
A SELF-GENERATING SEQUENCE. REF AMM 75 80 68.

426 1, 2, 4, 8, 16, 22, 24, 28, 36, 42, 44, 48, 56, 62, 64, 68, 76, 82
PERIODIC DIFFERENCES. REF TCPS 2 219 1827.

427 1, 2, 4, 8, 16, 31, 57, 99, 163, 256, 386, 562, 794, 1093, 1471, 1941, 2517, 3214, 4048, 5036, 6196, 7547, 9109, 10903, 12951, 15276, 17902, 20854, 24158, 27841, 31931
BINOMIAL COEFFICIENT SUMS. REF MAG 30 150 46. FQ 3 296 65.

428 1, 2, 4, 8, 16, 31, 58, 105, 185, 319, 541, 906, 1503, 2476, 4058, 6626, 10790, 17537, 28464, 46155, 74791, 121137, 196139, 317508, 513901, 831686, 1345888
A NONLINEAR BINOMIAL SUM. REF FQ 3 295 65.

429 1, 2, 4, 8, 16, 31, 61, 120, 236, 464, 912, 1793, 3525, 6930, 13624, 26784, 52656, 103519, 203513, 400096, 786568, 1546352, 3040048, 5976577, 11749641
PENTANACCI NUMBERS. REF FQ 5 260 67.

430 1, 2, 4, 8, 16, 32, 63, 124, 244, 480, 944, 1856, 3649, 7174, 14104, 27728, 54512, 107168, 210687, 414200, 814296, 1600864, 3147216, 6187264, 12163841
A PROBABILITY DIFFERENCE EQUATION. REF AMM 32 369 25.

?1 1, 2, 4, 8, 16, 32, 63, 125, 248, 492, 976, 1936, 3840, 7617, 15109, 29970, 59448,
7920, 233904, 463968, 920319, 1825529, 3621088, 7182728, 14247536
:XANACCI NUMBERS. REF FQ 5 260 67.

?2 1, 2, 4, 8, 16, 32, 64, 128, 256, 512, 1024, 2048, 4096, 8192, 16384, 32768, 65536,
1072, 262144, 524288, 1048576, 2097152, 4194304, 8388608, 16777216
)WERS OF TWO. REF BA1. MTAC 23 456 69.

?3 1, 2, 4, 8, 16, 36, 85, 239
:IGHTED LINEAR SPACES. REF BSM 22 234 70.

?4 1, 2, 4, 8, 17, 35, 71, 152, 314, 628, 1357, 2725, 5551, 12212, 24424, 48848,
8807, 218715, 438531, 878162, 1867334, 3845668, 7802447, 16705005
)WERS OF TWO WRITTEN IN BASE 9. REF EUR 14 13 51.

?5 1, 2, 4, 8, 17, 36, 78, 171, 379
STINCT VALUES TAKEN BY 22** ··· **2. REF GU7.**

?6 1, 2, 4, 8, 17, 39, 89, 211, 507, 1238, 3057, 7639, 19241, 48865, 124906, 321198,
0219, 2156010, 5622109, 14715813, 38649152, 101821927, 269010485
.COHOLS OR ROOTED TREES OF DEGREE AT MOST 4. REF JACS 54 2919 32. FI2 41.397.

?7 1, 2, 4, 8, 18, 40, 91, 210, 492, 1165, 2786, 6710, 16267, 39650, 97108, 238824,
9521
IMS OF FERMAT COEFFICIENTS. REF MMAG 27 143 54.

?8 1, 2, 4, 8, 18, 44, 122, 362, 1162, 3914, 13648
:CKLACES. REF IJM 5 664 61.

?9 1, 2, 4, 8, 20, 52, 152, 472, 1520, 5044, 17112, 59008, 206260, 729096, 2601640,
58944, 33904324, 123580884, 452902072, 1667837680, 6168510256
PRESENTATIONS OF ZERO. REF CMB 11 292 68.

'0 1, 2, 4, 8, 20, 56, 180, 596, 2068, 7316, 26272
CKLACES. REF IJM 5 664 61.

'1 1, 2, 4, 8, 20, 100, 2116, 1114244, 68723671300, 1180735735906024030724,
014118346050791735791497198691365786O
E SUM OF 2C(N, K). REF GO3.**

'2 1, 2, 4, 8, 21, 52, 131, 316, 765, 1846, 4494
LATED TO PARTITIONS OF A NUMBER. REF AMM 76 1036 69.

'3 1, 2, 4, 8, 22, 52, 140, 366, 992
CKLACES. REF IJM 2 302 58.

'4 1, 2, 4, 8, 24, 84, 328, 1372, 6024
ERGY FUNCTION FOR SQUARE LATTICE. REF PHA 28 925 62.

5 1, 2, 4, 9, 10, 12, 27, 37, 38, 44, 48, 78, 112, 168, 229, 297, 339
2N + 1 IS PRIME. REF PAMS 9 674 58.**

6 1, 2, 4, 9, 11, 23, 32, 39, 44, 51, 53, 60, 65, 72, 86, 93, 95, 114, 123, 156, 170, 179,
;, 200, 207, 212, 219, 228, 233, 240, 249, 261, 270, 303, 317, 333, 338, 345, 375, 389
N + 1) + 1)/7 IS PRIME. REF CU1 1 250.

447 1, 2, 4, 9, 16, 29, 47, 77, 118, 181, 267, 392, 560, 797, 1111, 1541, 2106, 2863,
3846, 5142, 6808, 8973, 11733, 15275, 19753, 25443, 32582, 41569, 52770, 66757
BIPARTITE PARTITIONS. REF PCPS 49 72 53. NI1 1.

448 1, 2, 4, 9, 18, 42, 96, 229, 549, 1346, 3326, 8329
CARBON TREES. REF CAY 9 454. ZFK 93 437 36.

449 1, 2, 4, 9, 19, 42, 89, 191, 402, 847, 1763, 3667, 7564, 15564, 31851, 64987,
132031, 267471, 539949, 1087004, 2181796, 4367927, 8721533, 17372967, 34524291
TREES OF HEIGHT AT MOST 4. REF IBMJ 4 475 60. KU1.

450 1, 2, 4, 9, 19, 48, 117, 307, 821, 2277
MINIMAL TRIANGLE GRAPHS. REF MTAC 21 249 67.

451 1, 2, 4, 9, 20, 45, 105, 249, 599
ESTERS. REF JACS 56 157 34.

452 1, 2, 4, 9, 20, 46, 105, 246, 583, 1393, 3355, 8133, 19825, 48554, 119412, 294761
SUMS OF FERMAT COEFFICIENTS. REF MMAG 27 143 54.

453 1, 2, 4, 9, 20, 47, 108, 252, 582, 1345, 3086, 7072, 16121, 36667, 83099, 187885,
423610, 953033, 2139158, 4792126, 10714105, 23911794, 53273599, 118497834
TREES OF HEIGHT AT MOST 5. REF IBMJ 4 475 60. KU1.

454 1, 2, 4, 9, 20, 48, 115, 286, 719, 1842, 4766, 12486, 32973, 87811, 235381,
634847, 1721159, 4688676, 12826228, 35221832, 97055181, 268282855, 743724984
ROOTED UNLABELED TREES. REF R1 138. HA5 232.

455 1, 2, 4, 9, 20, 51, 125, 329, 862, 2311, 6217, 16949, 46350, 127714, 353272,
981753
CONNECTED GRAPHS WITH AT MOST ONE CYCLE. REF FI2 41.399.

456 1, 2, 4, 9, 21, 51, 127, 323, 835, 2188, 5798, 15511, 41835, 113634, 310572,
853467, 2356779, 6536382, 18199284, 50852019, 142547559, 400763223, 1129760415
GENERALIZED BALLOT NUMBERS. REF BAMS 54 359 48. JSIAM 17 254 69.

457 1, 2, 4, 9, 21, 52, 129, 332, 859, 2261
PARAFFINS. REF JACS 56 157 34.

458 1, 2, 4, 9, 21, 56, 148, 428, 1305, 4191, 14140, 50159, 185987, 720298, 2905512,
12180208
GRAPHS BY POINTS AND LINES. REF R1 146. ST1.

459 1, 2, 4, 9, 22, 59, 167, 490, 1486, 4639, 14805, 48107, 158808, 531469, 1799659,
6157068, 21258104, 73996100, 259451116, 951695102, 3251073303
TOURNAMENT SCORES. REF CMB 7 135 64. MO1 68.

460 1, 2, 4, 9, 23, 63, 177, 514, 1527, 4625, 14230, 44357, 139779, 444558, 1425151,
4600339, 14939849, 48778197, 160019885, 527200711
RELATED TO SERIES-PARALLEL NUMBERS. REF JM2 21 92 42.

461 1, 2, 4, 9, 23, 63, 188
MIXED HUSIMI TREES. REF PNAS 42 535 56.

462 1, 2, 4, 9, 26, 101, 950
GEOMETRIES. REF JM2 49 127 70.

463 1, 2, 4, 10, 24, 55, 128, 300, 700, 1632, 3809, 8890, 20744, 48406
RESTRICTED PERMUTATIONS. REF AENS 79 207 62.

464 1, 2, 4, 10, 24, 66, 174, 504, 1406, 4210, 12198, 37378, 111278, 346846, 1053874
FOLDING A STRIP OF STAMPS. REF CJM 2 397 50. JCT 5 151 68.

465 1, 2, 4, 10, 24, 66, 176, 493, 1361
FOLDING A LINE. REF AMM 44 51 37.

466 1, 2, 4, 10, 24, 66, 180, 522, 1532, 4624, 14136, 43930, 137908, 437502, 1399068, 4507352, 14611576, 47633486, 156047204, 513477502, 1696305720, 5623993944
SERIES-PARALLEL NETWORKS. REF JM2 21 87 42. R1 142.

467 1, 2, 4, 10, 25, 64, 166
ALKYLS. REF ZFK 93 437 36.

468 1, 2, 4, 10, 25, 70, 196, 574, 1681
FOLDING A LINE. REF AMM 44 51 37.

469 1, 2, 4, 10, 26, 76, 232, 764, 2620, 9496, 35696, 140152, 568504, 2390480, 10349536, 46206736, 211799312, 997313824, 4809701440, 23758664096
A(N) = A(N − 1) + (N − 1)A(N − 2). REF LU1 1 221. R1 86. MU2 6. DMJ 35 659 68.

470 1, 2, 4, 10, 27, 74, 202, 548, 1490, 4052, 11013, 29937, 81377, 221207, 601302, 1634509, 4443055, 12077476, 32829985, 89241150, 242582598, 659407867
COSH(N). REF AMP 3 33 1843. MNAS 14(5) 14 25. HA4. LF1 93.

471 1, 2, 4, 10, 29, 90, 295, 1030, 3838, 15168, 63117, 275252, 1254801, 5968046, 29551768, 152005634, 810518729, 4472244574, 25497104007, 149993156234
FROM A DIFFERENTIAL EQUATION. REF AMM 67 766 60.

472 1, 2, 4, 10, 32, 122, 544, 2770, 15872, 101042, 707584, 5405530, 44736512, 398721962, 3807514624, 38783024290, 419730685952, 4809759350882
RELATED TO EULER NUMBERS. REF AMM 65 534 58. DKB 262.

473 1, 2, 4, 10, 36, 202
CHANGING MONEY. REF NMT 10 65 62.

474 1, 2, 4, 10, 37, 138
ROOTED PLANAR MAPS. REF CJM 15 542 63.

475 1, 2, 4, 10, 46, 1372, 475499108
BOOLEAN FUNCTIONS. REF JSIAM 12 294 64.

476 1, 2, 4, 11, 15, 18, 23, 37, 44, 57, 78, 88, 95, 106, 134, 156, 205, 221, 232, 249, 310, 323, 414, 429, 452, 550, 576, 639, 667, 715, 785, 816, 837, 946, 1003, 1038, 1122
OF THE FORM (P2 − 49)/120 WHERE P IS PRIME. REF IAS 5 382 37.**

477 1, 2, 4, 11, 19, 56, 96, 296, 554, 1593, 3093
PERMUTATION GROUPS. REF JPC 33 1069 29.

478 1, 2, 4, 11, 33, 116, 435, 1832, 8167, 39700, 201785, 1099449, 6237505
REFINEMENTS OF PARTITIONS. REF GU5.

479 1, 2, 4, 11, 34, 156, 1044, 12346, 274668, 12005168, 1018997864, 165091172592, 50502031367952, 29054155657235488, 31426485969804308768
GRAPHS OR REFLEXIVE SYMMETRIC RELATIONS. REF MI1 17 22 55. MAN 174 68 67. HA5 214.

480 1, 2, 4, 12, 32, 108, 336, 1036, 3120, 9540, 29244
RESTRICTED PERMUTATIONS. REF AENS 79 213 62.

481 1, 2, 4, 12, 34, 111, 360, 1226
ROOTED PLANAR 2-TREES. REF MAT 15 121 68.

482 1, 2, 4, 12, 39, 202, 1219, 9468, 83435, 836017, 9223092, 111255228, 1453132944, 20433309147, 307690667072, 4940118795869, 84241805734539
POLYGONS. REF AMM 67 349 60.

483 1, 2, 4, 12, 48, 200, 1040, 5600, 33600
SORTING NUMBERS. REF PSPM 19 173 71.

484 1, 2, 4, 12, 56, 456, 6880, 191536, 9733056, 903753248, 154108311168
TOURNAMENTS. REF MO1 87.

485 1, 2, 4, 12, 81, 1684, 123565, 33207256, 34448225389
THRESHOLD FUNCTIONS. REF PGEC 19 821 70.

486 1, 2, 4, 12, 81, 2646
SELF-DUAL MONOTONE BOOLEAN FUNCTIONS. REF WE1 181.

487 1, 2, 4, 12, 108, 10476, 108625644, 11798392680793836, 139202068568601568785946949658348
A NONLINEAR RECURRENCE. REF SA2.

488 1, 2, 4, 13, 41, 226, 1072, 9374, 60958, 723916, 5892536, 86402812, 83764188 14512333928, 162925851376, 3252104882056, 41477207604872
TERMS IN A SKEW DETERMINANT. REF PRSE 21 354 1896.

489 1, 2, 4, 13, 42, 308
CONNECTED LINEAR SPACES. REF BSM 19 424 67.

490 1, 2, 4, 14, 34, 98, 270, 768, 2192, 6360, 18576, 54780, 162658, 486154, 14611 4413988, 13393816, 40807290
PARAFFINS. REF JACS 54 1105 32.

491 1, 2, 4, 14, 54, 332, 2246, 18264, 164950, 1664354, 18423144, 222406776, 2905943328, 40865005494, 615376173184, 9880209206458, 168483518571798
POLYGONS. REF AMM 67 349 60.

492 1, 2, 4, 14, 104, 1882, 94572, 15028134, 8378070864, 17561539552946
THRESHOLD FUNCTIONS. REF PGEC 19 821 70.

493 1, 2, 4, 14, 128, 3882, 412736, 151223522, 189581406208, 820064805806914, 12419746847290729472, 6685900833067943215l6802
BINOMIAL COEFFICIENT SUMS. REF PGEC 14 322 65.

494 1, 2, 4, 14, 222, 616126, 200253952527184
BOOLEAN FUNCTIONS. REF HA2 153.

495 1, 2, 4, 16, 56, 256, 1072, 6224, 33616, 218656, 1326656, 9893632, 70186624, 574017536, 4454046976, 40073925376, 347165733632, 3370414011904
PERMUTATIONS OF ORDER 4. REF CJM 7 159 55.

496 1, 2, 4, 16, 80, 520, 3640, 29120
PERMUTATIONS BY NUMBER OF CYCLES. REF R1 85.

497 1, 2, 4, 16, 256, 65536, 4294967296, 18446744073709551616, 340282366920938463463374607431768211456
2(2**N). REF MTAC 23 456 69.**

498 1, 2, 4, 24, 128, 880, 7440
SORTING NUMBERS. REF PSPM 19 173 71.

499 1, 2, 4, 24, 1104, 2435424, 11862575248704, 281441383062305809756861824, 158418504200047111075388369241884118003210485743490304
A SLOWLY CONVERGING SERIES. REF AMM 54 138 47.

500 1, 2, 4, 60, 1276, 41888, 1916064, 116522048, 9069595840, 878460379392
RELATED TO LATIN RECTANGLES. REF BU2 33 125 41.

501 1, 2, 4, 104, 272, 3104, 79808
EXPANSION OF SINH X / SIN X. REF MMAG 31 189 58.

SEQUENCES BEGINNING 1, 2, 5

502 1, 2, 5, 3, 15, 140, 5, 56
QUEENS PROBLEM. REF SL1 49.

503 1, 2, 5, 4, 12, 6, 9, 23, 11, 27, 34, 22, 10, 33, 15, 37, 44, 28, 80, 19, 81, 14, 107, 89, 64, 16, 82, 60, 53, 138, 25, 114, 148, 136, 42, 104, 115, 63, 20, 143, 29, 179, 67, 109
A NUMBER-THEORETIC FUNCTION. REF AMM 56 526 49.

504 1, 2, 5, 5, 16, 7, 50
TRANSITIVE GROUPS. REF BAMS 2 143 1896.

505 1, 2, 5, 6, 7, 10, 12, 14, 15, 20, 21, 22, 23, 25, 26, 30, 31, 34, 36, 37, 38, 39, 41, 42, 45, 46, 47, 49, 50, 52, 53, 54, 55, 57, 58, 60, 62, 66, 69, 70, 71, 72, 73, 74, 76, 78, 79
ELLIPTIC CURVES. REF JRAM 212 24 63.

506 1, 2, 5, 6, 8, 12, 18, 30, 36, 41, 66, 189, 201, 209, 276, 353, 408, 438, 534
3.2N + 1 IS PRIME. REF PAMS 9 674 58.**

507 1, 2, 5, 6, 11, 13, 17, 22, 27, 29, 37, 44, 44, 55
GENERALIZED DIVISOR FUNCTION. REF PLMS 19 112 19.

508 1, 2, 5, 6, 14, 21, 29, 30, 54, 90, 134, 155, 174, 230, 234, 251, 270, 342, 374, 461, 494, 550, 666, 750, 810, 990, 1890, 2070, 2486, 2757, 2966, 3150, 3566, 3630, 4554
LATTICE POINTS IN SPHERES. REF MTAC 20 306 66.

509 1, 2, 5, 7, 10, 13, 15, 18, 20, 23, 26, 28, 31, 34, 36, 39, 41, 44, 47, 49, 52, 54, 57, 60, 62, 65, 68, 70, 73, 75, 78, 81, 83, 86, 89, 91, 94, 96, 99, 102, 104, 107, 109, 112, 115
A BEATTY SEQUENCE. REF CMB 2 191 59. AMM 72 1144 65.

510 1, 2, 5, 7, 11, 14, 20, 24, 30, 35
CONSISTENT ARCS IN A TOURNAMENT. REF CMB 12 263 69. RE1.

511 1, 2, 5, 7, 12, 15, 22, 26, 35, 40, 51, 57, 70, 77, 92, 100, 117, 126, 145, 155, 176, 187, 210, 222, 247, 260, 287, 301, 330, 345, 376, 392, 425, 442, 477, 495, 532, 551, 590
GENERALIZED PENTAGONAL NUMBERS. REF AMM 76 884 69. HO2 119.

512 1, 2, 5, 7, 12, 19, 31, 50, 81, 131, 212, 343, 555, 898, 1453, 2351, 3804, 6155, 9959, 16114, 26073, 42187, 68260, 110447, 178707, 289154, 467861, 757015, 12248
A(N) = A(N − 1) + A(N − 2). REF FQ 3 129 65.

513 1, 2, 5, 7, 19, 26, 71, 97, 265, 362, 989, 1351, 3691, 5042, 13775, 18817, 51409 70226, 191861, 262087, 716035, 978122, 2672279, 3650401, 9973081, 13623482
A(2N) = A(2N − 1) + A(2N − 2), A(2N + 1) = 2A(2N) + A(2N − 1). REF MQET 1 10 16. N 181.

514 1, 2, 5, 7, 26, 265, 1351, 5042, 13775, 18817, 70226, 716035, 3650401
RELATED TO GENOCCHI NUMBERS. REF AMM 36 645 35.

515 1, 2, 5, 8, 11, 14, 18, 22, 27, 31
PARTITIONS INTO NON-INTEGRAL POWERS. REF PCPS 47 214 51.

516 1, 2, 5, 8, 13, 16, 21, 26, 35
RAMSEY NUMBERS. REF CMB 8 579 65.

517 1, 2, 5, 8, 13, 18, 25, 32, 41, 50, 61, 72, 85, 98, 113, 128, 145, 162, 181, 200, 22 242, 265, 288, 313, 338, 365, 392, 421, 450, 481, 512, 545, 578, 613, 648, 685, 722, 7
NEAREST INTEGER TO (N2 + 1)/2.**

518 1, 2, 5, 8, 14, 21, 32, 45, 65, 88, 121, 161, 215, 280, 367, 471, 607, 771, 980, 12 1551, 1933, 2410, 2983, 3690, 4536, 5574, 6811, 8317, 10110, 12276
TREES OF DIAMETER 4. REF IBMJ 4 476 60. KU1.

519 1, 2, 5, 8, 18, 29, 57, 96, 183, 318, 603, 1080, 2047, 3762
POLYTOPES. REF GR2 424.

520 1, 2, 5, 8, 21, 42, 96, 222, 495, 1177, 2717, 6435, 15288, 36374, 87516, 210494 509694, 1237736, 3014882, 7370860, 18059899, 44379535, 109298070, 269766655
PARTITIONS OF POINTS ON A CIRCLE. REF BAMS 54 359 48.

521 1, 2, 5, 9, 9, 2, 1, 0, 4, 9, 8, 9, 4, 8, 7, 3, 1, 6, 4, 7, 6, 7, 2, 1, 0, 6, 0, 7, 2, 7, 8, 2, 8, 3, 5, 0, 5, 7, 0, 2, 5, 1, 4, 6, 4, 7, 0, 1, 5, 0, 7, 9, 8, 0, 0, 8, 1, 9, 7, 5, 1, 1, 2, 1, 5, 5, 2
CUBE ROOT OF 2. REF SMA 18 175 52.

522 1, 2, 5, 9, 14, 20, 27, 35, 44, 54, 65, 77, 90, 104, 119, 135, 152, 170, 189, 209, 2 252, 275, 299, 324, 350, 377, 405, 434, 464, 495, 527, 560, 594, 629, 665, 702, 740, 7
N(N + 3)/2.

523 1, 2, 5, 9, 15, 23, 34, 47, 64, 84, 108, 136, 169, 206, 249, 297, 351, 411, 478, 55
HYDROCARBONS. REF JACS 55 684 33.

524 1, 2, 5, 9, 17, 27, 40, 55, 73, 117, 143
RATIONAL POINTS IN A QUADRILATERAL. REF JRAM 227 47 67.

525 1, 2, 5, 9, 17, 28, 47, 73, 114, 170, 253, 365, 525, 738, 1033, 1422, 1948, 2634, 3545, 4721, 6259, 8227, 10767, 13990, 18105, 23286, 29837, 38028, 48297, 61053
PARTITIONS INTO PARTS OF 2 KINDS. REF RS2 90. RCI 199.

526 1, 2, 5, 9, 18, 35, 57
POLYHEDRA. REF JRM 4 123 71.

527 1, 2, 5, 9, 21, 44, 103, 232, 571, 1368, 3441
TOTAL DIAMETER OF UNLABELED TREES. REF IBMJ 4 476 60.

528 1, 2, 5, 9, 22, 62, 177, 560, 1939
SERIES-REDUCED STAR GRAPHS. REF JMP 7 1585 66.

529 1, 2, 5, 10, 13, 17, 26, 29, 37, 41, 50, 53, 58, 61, 65, 73, 74, 82, 85, 89, 97, 101, 106, 109, 113, 122, 125, 130, 137, 145, 149, 157, 170, 173, 181, 185, 193, 197, 202, 218
SOLUBLE PELLIANS. REF AMP 52 48 1871. KR1 1 46. LE1 56.

530 1, 2, 5, 10, 15, 25, 37, 52, 67, 97, 117
GENERALIZED DIVISOR FUNCTION. REF PLMS 19 112 19.

531 1, 2, 5, 10, 16, 24, 33, 44, 56, 70, 85, 102, 120, 140, 161, 184, 208, 234, 261, 290, 320
SERIES-REDUCED PLANTED TREES. REF RI1.

532 1, 2, 5, 10, 18, 32, 55, 90, 144, 226, 346, 522, 777, 1138, 1648, 2362, 3348, 4704, 6554, 9056, 12425, 16932
COEFFICIENTS OF AN ELLIPTIC FUNCTION. REF CAY 9 128.

533 1, 2, 5, 10, 19, 33, 57, 92, 147, 227, 345, 512, 752, 1083, 1545, 2174, 3031, 4179, 5719, 7752, 10438, 13946, 18519, 24428, 32051, 41805, 54265, 70079, 90102, 115318
PARTITIONS INTO PARTS OF 2 KINDS. REF RS2 90. RCI 199.

534 1, 2, 5, 10, 20, 24, 26, 41, 53, 130, 149, 205, 234, 287, 340, 410, 425, 480, 586, 840, 850, 986, 1680, 1843, 2260, 2591, 3023, 3024, 3400, 3959, 3960, 5182, 5183, 7920
LATTICE POINTS IN CIRCLES. REF MTAC 20 306 66.

535 1, 2, 5, 10, 20, 35, 62, 102, 167, 262, 407, 614, 919, 1345, 1952, 2788, 3950, 5524, 7671, 10540, 14388, 19470, 26190, 34968, 46439, 61275, 80455, 105047, 136541
PARTITIONS INTO PARTS OF 2 KINDS. REF RS2 90. RCI 199.

536 1, 2, 5, 10, 20, 36, 65, 110, 185, 300, 481, 752, 1165, 1770, 2665, 3956, 5822, 8470, 12230, 17490, 24842, 35002, 49010, 68150, 94235, 129512, 177087, 240840
PARTITIONS INTO PARTS OF 2 KINDS. REF RS2 90. RCI 199.

537 1, 2, 5, 10, 20, 38, 71, 130, 235, 420, 744, 1308, 2285, 3970, 6865, 11822, 20284, 34690, 59155, 100610, 170711, 289032, 488400, 823800, 1387225, 2332418, 3916061
CONVOLVED FIBONACCI NUMBERS. REF RCI 101. FQ 3 51 65, 8 163 70.

538 1, 2, 5, 10, 20, 40, 86, 192, 440, 1038, 2492, 6071, 14960, 37198, 93193, 234956, 595561, 1516638, 3877904, 9950907, 25615653, 66127186, 171144671
EXPONENTIAL INTEGRAL OF N. REF RS3 160 384 1870. PHM 33 757 42. FMR 1 267.

539 1, 2, 5, 10, 22, 40, 75, 130, 230, 382, 636, 1016, 1633, 2540, 3942, 5978, 9057
COEFFICIENTS OF MODULAR FUNCTIONS. REF PLMS 9 386 59.

540 1, 2, 5, 10, 24, 63, 165, 467, 1405, 4435, 14775, 51814, 190443, 732472, 2939612
GRAPHS BY POINTS AND LINES. REF R1 146. ST1.

541 1, 2, 5, 10, 25, 56, 139, 338, 852
ALCOHOLS. REF BER 8 1545 1875.

542 1, 2, 5, 11, 21, 39, 73, 129, 226, 388, 659, 1100, 1821
PLANAR PARTITIONS. REF MA2 2 332.

543 1, 2, 5, 11, 23, 47, 94, 185
COMPOSITIONS. REF R1 155.

544 1, 2, 5, 11, 25, 66, 172, 485, 1446, 4541, 15036, 52496, 192218, 737248
GRAPHS BY POINTS AND LINES. REF R1 146. ST1.

545 1, 2, 5, 11, 26, 68, 177, 497, 1476
GRAPHS BY NUMBER OF LINES. REF R1 146. ST1. MAN 174 68 67.

546 1, 2, 5, 11, 28, 74, 199, 551, 1553, 4436, 12832, 37496, 110500, 328092, 98049 2946889, 8901891, 27011286, 82299275
PARAFFINS. REF JACS 54 1105 32.

547 1, 2, 5, 11, 31, 77, 214, 576, 1592, 4375, 12183, 33864, 94741, 265461, 746372
CONNECTED GRAPHS WITH 1 CYCLE. REF FI2 41.399.

548 1, 2, 5, 11, 38, 174, 984, 6600, 51120, 448560, 4394880
BINOMIAL COEFFICIENT SUMS. REF CJM 22 26 70.

549 1, 2, 5, 12, 17, 63, 143, 492, 635, 2397, 3032, 93357, 96389, 478913, 575302, 1629517, 15240955, 93075247, 387541943, 480617190, 868159133, 2216935456
CONVERGENTS TO CUBE ROOT OF 4. REF AMP 46 106 1866. LE1 67. HPR.

550 1, 2, 5, 12, 24, 56, 113, 248, 503, 1043, 2080, 4169, 8145, 15897, 30545, 58402, 110461, 207802, 387561, 718875, 1324038, 2425473, 4416193, 7999516, 14411507
RELATED TO SOLID PARTITIONS. REF MTAC 24 956 70.

551 1, 2, 5, 12, 27, 59, 127
COMPOSITIONS. REF R1 155.

552 1, 2, 5, 12, 29, 70, 169, 408, 985, 2378, 5741, 13860, 33461, 80782, 195025, 470832, 1136689, 2744210, 6625109, 15994428, 38613965, 93222358, 225058681
PELL NUMBERS A(N) = 2A(N − 1) + A(N − 2). REF FQ 4 373 66.

553 1, 2, 5, 12, 30, 74, 188, 478, 1235, 3214, 8450, 22370, 59676, 160140, 432237, 1172436, 3194870, 8741442, 24007045, 66154654, 182864692, 506909562, 14088549
POWERS OF ROOTED TREE ENUMERATOR. REF R1 150.

554 1, 2, 5, 12, 30, 76, 196
GENERALIZED BALLOT NUMBERS. REF JSIAM 17 254 69.

555 1, 2, 5, 12, 31, 80, 210, 555, 1479, 3959
PARAFFINS. REF JACS 56 157 34.

556 1, 2, 5, 12, 32, 94, 289, 910, 2934, 9686, 32540, 110780
BALANCING WEIGHTS. REF JCT 7 132 69.

557 1, 2, 5, 12, 33, 87, 252, 703, 2105, 6099, 18689, 55639, 173423, 526937, 16640 5137233, 16393315, 51255709, 164951529, 521138861, 1688959630, 5382512216
FOLDING A LINE. REF MTAC 22 198 68.

558 1, 2, 5, 12, 33, 90, 261, 766, 2312, 7068, 21965, 68954, 218751, 699534, 22536 7305788, 23816743, 78023602, 256738751
SERIES-REDUCED PLANTED TREES. REF CAY 3 246. RI1.

559 1, 2, 5, 12, 34, 130
TRIANGULATIONS OF SPHERE. REF MTAC 21 252 67.

560 1, 2, 5, 12, 35, 107, 363, 1248, 4460, 16094, 58937, 217117, 805475, 3001211
POLYOMINOES WITHOUT HOLES. REF PA1. JRM 2 182 69. LU2.

561 1, 2, 5, 12, 35, 108, 369, 1285, 4655, 17073, 63600, 238591, 901971, 3426576, 13079255, 50107911, 192622052
POLYOMINOES. REF AT1 363.

562 1, 2, 5, 12, 37, 123, 446, 1689, 6693, 27034, 111630, 467262, 1981353, 8487400, 36695369, 159918120, 701957539, 3101072051, 13779935438, 61557789660
RESTRICTED HEXAGONAL POLYOMINOES. REF EMS 17 11 70. RE3.

563 1, 2, 5, 12, 53, 171, 566, 737, 4251, 4988, 9239, 41944, 428679, 7329487, 7758166, 115943811, 123701977, 239645788, 731522646953, 731762292741
CONVERGENTS TO CUBE ROOT OF 5. REF AMP 46 107 1866. LE1 67. HPR.

564 1, 2, 5, 13, 17, 29, 37, 41, 53, 61, 73, 89, 97, 101, 109, 113, 137, 149, 157, 173, 181, 193, 197, 229, 233, 241, 257, 269, 277, 281, 293, 313, 317, 337, 349, 353, 373, 389
PRIMES WHICH ARE THE SUM OF 2 SQUARES. REF AMM 56 526 49.

565 1, 2, 5, 13, 19, 32, 53, 89, 139, 199, 293, 887, 1129, 1331, 5591, 8467, 9551, 15683, 19609, 31397, 370261, 1357201, 1561919, 2010733, 3826019, 3933599, 4652353
FROM GAPS BETWEEN PRIME-POWERS. REF DVSS 2 255 1884.

566 1, 2, 5, 13, 29, 34, 89, 169, 194, 233, 433
SOLUTIONS OF A DIOPHANTINE EQUATION. REF LEM 6 19 60.

567 1, 2, 5, 13, 33, 80, 184, 402, 840
EXPANSION OF BRACKET FUNCTION. REF FQ 2 256 64.

568 1, 2, 5, 13, 33, 89, 240, 657, 1806, 5026, 13999, 39260, 110381, 311465, 880840, 2497405
CONNECTED GRAPHS WITH ONE CYCLE. REF R1 150. ST1.

569 1, 2, 5, 13, 34, 89, 233, 610, 1597, 4181, 10946, 28657, 75025, 196418, 514229, 1346269, 3524578, 9227465, 24157817, 63245986, 165580141, 433494437
BISECTION OF FIBONACCI SEQUENCE. REF R1 39. FQ 9 283 71.

570 1, 2, 5, 13, 35, 95, 262, 727, 2033, 5714
PARTIALLY LABELED ROOTED TREES. REF R1 134.

571 1, 2, 5, 13, 36, 102, 296, 871, 2599
NONISENTROPIC BINARY TREES. REF GU5.

572 1, 2, 5, 13, 36, 109, 359, 1266, 4731, 18657, 77464, 337681, 1540381, 7330418, 36301105, 186688845, 995293580, 5491595645, 31310124067, 184199228226
FROM A DIFFERENTIAL EQUATION. REF AMM 67 766 60.

573 1, 2, 5, 13, 38, 116, 382, 1310, 4748, 17848, 70076, 284252, 1195240, 5174768, 23103368, 105899656, 498656912, 2404850720, 11879332048, 59976346448
A(N) = A(N − 1) + N.A(N − 2). REF R1 86 (DIVIDED BY 2).

574 1, 2, 5, 13, 44, 191, 1229, 13588, 288597
DISCONNECTED GRAPHS. REF TAMS 78 459 55. ST1.

575 1, 2, 5, 14, 39, 109
PARAFFINS. REF ZFK 93 437 36.

576 1, 2, 5, 14, 39, 120, 358, 1176, 3527, 11622, 36627, 121622, 389560, 1301140, 4215748
FOLDING A STRIP OF STAMPS. REF JCT 5 151 68.

577 1, 2, 5, 14, 42, 132, 429, 1430, 4862, 16796, 58786, 208012, 742900, 2674440, 9694845, 35357670, 129644790, 477638700, 1767263190, 6564120420, 24466267020
CATALAN NUMBERS OR BINOMIAL COEFFICIENTS C(2N, N)/(N + 1). REF AMM 72 973 65. GU1. RCI 101. CO1 1 67. GO4.

578 1, 2, 5, 14, 44, 152
PARTITION FUNCTION FOR SQUARE LATTICE. REF AIP 9 279 60.

579 1, 2, 5, 14, 46, 166, 652, 2780, 12644, 61136, 312676, 1680592, 9467680, 55704104, 341185496, 2170853456, 14314313872, 97620050080, 687418278544
THE PARTITION FUNCTION G(N, 3). REF CMB 1 87 58.

580 1, 2, 5, 14, 50, 233, 1249, 7595
TRIANGULATIONS OF SPHERE. REF MTAC 21 252 67. GR2 424. JCT 7 157 69.

581 1, 2, 5, 14, 51, 267
NUMBER OF GROUPS OF ORDERS 2, 4, 8, 16, 32, 64. REF HS1.

582 1, 2, 5, 15, 32, 99, 210, 650, 1379, 4268, 9055, 28025, 59458, 184021, 390420, 1208340, 2563621, 7934342, 16833545, 52099395
A TERNARY CONTINUED FRACTION. REF TOH 37 441 33.

583 1, 2, 5, 15, 49, 169, 602, 2191
PERMUTATIONS BY INVERSIONS. REF NET 96.

584 1, 2, 5, 15, 51, 196, 827, 3795, 18755, 99146, 556711, 3305017, 20655285, 135399720, 927973061, 6631556521, 49294051497, 380306658250, 3039453750685
THE PARTITION FUNCTION G(N, 4). REF CMB 1 87 58.

585 1, 2, 5, 15, 52, 203, 877, 4140, 21147, 115975, 678570, 4213597, 27644437, 190899322, 1382958545, 10480142147, 82864869804, 682076806159, 58327422050
BELL NUMBERS. REF MTAC 16 418 62. AMM 71 498 64. PSPM 19 172 71. GO4.

586 1, 2, 5, 16, 52, 208
INVERSE SEMIGROUPS. REF PL1. MA4 2 2 67.

587 1, 2, 5, 16, 61, 272, 1385, 7936, 50521, 353792, 2702765, 22368256, 19936098 1903757312, 19391512145, 209865342976, 2404879675441, 29088885112832
EULER NUMBERS. REF JDM 7 171 1881. JO1 238. NET 110. DKB 262. CO1 2 101.

588 1, 2, 5, 16, 63, 318, 2045
UNLABELED PARTIALLY ORDERED SETS. REF BI1 4. NAMS 17 646 70. WH1. WR1.

589 1, 2, 5, 16, 65, 326, 1957, 13700, 109601, 986410, 9864101, 108505112, 1302061345, 16926797486, 236975164805, 3554627472076, 56874039553217
PERMUTATIONS OF N THINGS. REF R1 16. MST 31 79 63.

590 1, 2, 5, 16, 67, 435
CIRCUITS BY NULLITY. REF AIEE 51 311 32.

591 1, 2, 5, 16, 73, 538
CIRCUITS BY RANK. REF AIEE 51 313 32.

592 1, 2, 5, 17, 37, 101, 197, 257, 401, 577, 677, 1297, 1601, 2917, 3137, 4357, 547 7057, 8101, 8837, 12101, 13457, 14401, 15377, 15877, 16901, 17957, 21317, 22501
PRIMES OF FORM N**2 + 1. REF EUL (1) 3 22 17.