

MISCELLANEOUS PROBLEM INDEX
Problems by Proposer, Number, Topic & Location,
& by Solution Location

Note: Many problems in this section are exercises or conjectures, sometimes proven in other research papers. Solutions and location of solutions, unless specifically given as solutions in *TFQ*, are not provided. Also not included are problems and projects which authors indicate that they will pursue themselves. Problems from multiple authors are listed initially by the first author listed in the article. Problem numbers (mostly) are those of the proposers.

Proposed by A. Adelberg

To: Conjectures concerning Bernoulli polynomials PVII(7)

Proposed by I. Adler

1. To: Linear Diophantine equations 6.6(1968)364
2. To: Linear Diophantine equations 6.6(1968)364
3. To: Linear Diophantine equations 6.6(1968)369
4. To: Linear Diophantine equations 6.6(1968)369
5. To: Linear Diophantine equations 7.2(1969)183
6. To: Linear Diophantine equations 7.2(1969)183
7. To: Linear Diophantine equations 7.2(1969)184
8. To: Simultaneous Diophantine equations 7.2(1969)186
9. To: Simultaneous Diophantine equations 7.2(1969)186
10. To: Simultaneous Diophantine equations 7.2(1969)187
11. To: Simultaneous Diophantine equations 7.2(1969)187
12. To: Simultaneous Diophantine equations 7.2(1969)188

Proposed by A.K. Agarwal

To: Certain polynomials as generating functions 27.2(1989)174

1. To: Coefficients in a polynomial expansion and partitions of an integer 27.2(1989)174
2. To: Number of partitions of an integer mod (20) 27.2(1989)174
3. To: Coefficients in a polynomial expansion and partitions of an integer 27.2(1989)174
 - i. To: Combinatorial meaning of a class of numbers related to combinatorial multiples of the Lucas numbers 28.3(1990)199
 - ii. To: Associating the class of numbers related to combinatorial multiples of the Lucas numbers to other mathematical objects 28.3(1990)199

Proposed by A.V. Aho & N.J.A. Sloane

To: Nonlinear recurrence relation 11.4(1973)436

Proposed by W. Aiello, G.E. Hardy, & M.V. Subbarao

- 3.21 To: Monotonic functions related to e-multiperfect numbers 25.1(1987)71
- 3.22 To: The existence of e-multiperfect numbers 25.1(1987)71

Proposed by C.O. Alford & D.C. Fielder

To: Hoggatt position sequence in a Hoggatt triangle, PIII(1990)87

To: Suggested research into successor identities and Diophantine generalizations PVII(103)

Proposed by R.C. Alperin

To: Proving alternatin partial sums of chebyshev polynomials analogues for various recurrence relations 58.2(2020)141

Proposed by P.G. Anderson

To: Building binary trees, PIV(1991)7

To: Binary trees and continued fractions, PIV(1991)7

To: Random number generators and the unit square, PIV(1991)7

MISCELLANEOUS PROBLEM INDEX

Proposed by S. Ando & K. Nagasaka

To: Integers m for which the sequence of Fibonacci numbers is weakly uniformly distributed mod m , PII(1988)27

Proposed by P. Andaloro

To: Identifying numbers with equal stopping times 38.1 (2000)78

Proposed by K.T. Atanassov

To: Generalization and properties of certain Fibonacci-type sequences 24.4(1986)365

Proposed by K. Atanassov, J. Hlebarska & S. Mihov

To: Explicit formula for generating generalized Fibonacci sequences 30.1(1992)79

Proposed by Br. U. Alfred (A. Brousseau)

1. To: Sum of even subscripted Fibonacci numbers 1.1(1963)62
2. To: Summing every fourth Fibonacci number 1.1(1963)62
3. To: Summing every third Fibonacci number 1.1(1963)63
1. To: Unified Fibonacci-Lucas products 4.3(1966)263
2. To: Examples of non-unified Fibonacci-Lucas products 4.3(1966)263
3. To: Formulas for Fibonacci sequences 4.3(1966)263
- 1.1 To: Recursion relation of a given sequence 6.4(1968)285
- 1.2 To: Recursion relation of a given sequence 6.4(1968)285
- 1.3 To: Recursion relation of a given sequence 6.4(1968)285
- 1.4 To: n th term of a ratio recursion relation 6.4(1968)285
- 1.5 To: Recursion relation from the n th term 6.4(1968)285
- 1.6 To: Recursion relation from a cubic polynomial 6.4(1968)285
- 1.7 To: Recursion relation from an exponential 6.4(1968)285
- 1.8 To: Non-homogeneous recursion relation 6.4(1968)285
- 1.9 To: Product recursion relation 6.4(1968)285
- 1.10 To: Recursion relation from the n th term 6.4(1968)285
[The answers to all 10 of these problems are in 6.4(1968)260]
- 2.1 To: Recursion relation for a given sequence 6.6(1968)398
- 2.2 To: Second-order recursion relation 6.6(1968)398
- 2.3 To: Second-order recursion relation 6.6(1968)399
- 2.4 To: Third-order recursion relation 6.6(1968)399
- 2.5 To: Third-order recursion relation 6.6(1968)399
[The answers to all 5 of these problems are in 6.6(1968)399]
- 3.1 To: Lucas recursion relation 7.1(1969)104
- 3.2 To: Lucas-Fibonacci recursion relation 7.1(1969)104
- 3.3 To: Recursion relation for F_{3n} 7.1(1969)104
- 3.4 To: Recursion relation for F_{5n} 7.1(1969)104
- 3.5 To: Recursion relation for L_{3n} 7.1(1969)104
- 3.6 To: Recursion relation for L_{5n} 7.1(1969)104
- 3.7 To: Fibonacci recursion relation 7.1(1969)104
- 3.8 To: F_n as powers of 5, 7.1(1969)104
- 3.9 To: L_n as powers of 5, 7.1(1969)104
- 3.10 To: Sums of two Fibonacci squares 7.1(1969)104
[The answers to all 10 of these problems are in 7.1(106)]
- 4.1 To: Divisibility and recursion 7.2(1969)199
- 4.2 To: Divisibility and Lucas numbers 7.2(1969)200
- 4.3 To: Second-order recursion relation 7.2(1969)200
- 4.4 To: Arithmetic progression and recursion 7.2(1969)200
- 4.5 To: Second-order recursion relation 7.2(1969)200

MISCELLANEOUS PROBLEM INDEX

Proposed by Br. U. Alfred (A. Brousseau)

- 4.6 To: Second-order recursion relation 7.2(1969)200
4.7 To: Recursion from a given sequence 7.2(1969)200
4.8 To: Second-order recursion relation 7.2(1969)200
4.9 To: Second-order recursion relation 7.2(1969)200
4.10 To: Recursion from a Binet-type relation 7.2(1969)200
5.1 To: Recursion relation for a given sequence 7.3(1969)300
[The answers to problems 1 - 5 are in 7.2(1969)210 and 6-10 are in 7.2(1969)224]
5.2 To: Third-order recursion relation 7.3(1969)300
5.3 To: Geometric progression, Fibonacci numbers and a recursion relation 7.3(1969)300
5.4 To: Fibonacci in a recursion relation 7.3(1969)300
5.5 To: Third-order recursion relation, 7.3(1969)300
[The answers to all 5 of these problems are in 7.3(1969)302]
6.1 To: Geometric progression, Fibonacci numbers and a recursion relation 7.5(1969)537
6.2 To: Third and fourth-order recursion 7.5(1969)537
6.3 To: Arithmetic and geometric progression in recursion relations 7.5(1969)538
6.4 To: Third-order recursion relation for squares of Fibonacci numbers 7.5(1969)538
6.5 To: Lucas-Fibonacci recursion relation 7.5(1969)538
[The answers to all 5 of these problems are in 7.5(1969)544]
7.1 To: Sequence from a polynomial 8.1(1970)101
7.2 To: Sequence from a polynomial and a Fibonacci-type sequence 8.1(1970)101
7.3 To: Sequence from a polynomial and a geometric progression 8.1(1970)101
7.4 To: Sequence from a polynomial and a geometric progression 8.1(1970)101
7.5 To: Sequence from a polynomial and a Fibonacci-type sequence 8.1(1970)101
[The answers to all 5 of these problems are in 8.1(1970)112]
8.1 To: Largest root of a cubic equation 8.3(1970)316
8.2 To: Ratio of successive terms in a sequence having a given third-order recursion relation 8.3(1970)316
8.3 To: Ratio of successive terms in a sequence having a given fourth-order recursion relation 8.3(1970)316
8.4 To: Fibonacci numbers and ratios of successive terms in a sequence with given recursion relation 8.3 (1970)316
8.5 To: Ratio of terms from two sequences 8.3(1970)316
8.6 To: Third-order recursion relation 8.3(1970)316
[The answers to all 6 of these problems are in 8.3(1970)324]
To: Divisibility of Fibonacci sums by L_{11} 11.3(1973)332

Proposed by G.E. Andrews

To: Proving Schur polynomial identities using operator methods 42.1(2004)18

Proposed by R.B. Backstrom

To: Proving that a sequence satisfying a certain given recurrence relation with initial value a negative integer is itself recursive 18.3(1980)241

To: Finding sums of several series of the form $\sum G(n)$, where $G(n) = (L_{an+b} + c)^{-1}$, 19.1(1981)20

MISCELLANEOUS PROBLEM INDEX

Proposed by C. Ballot

1. Find a combinatorial interpretation of the Lucasnomial Catalan numbers 55.4(306)
2. Do three theorems for regular Lucas sequences extend to all non-degenerate Lucas sequences? 55.4(306)
3. Is the set of all integers such that the middle Fibonomial coefficient is prime to a positive integer infinite? 55.4(306)
4. Do infinitely many integers exist for which the middle Lucasnomial coefficient is coprime to 105? 55.4(306)

Proposed by R. A. Bateman, E.A. Clark, M.L. Hancock & C.A. Reiter

1. To: Equation involving the period of a p, q sequence relating to a continued fraction 29.3(1991)228
2. To: Dependency on initial conditions for the lengths of a periodic sequence 29.3(1991)228
3. To: The period of a p, q sequence relating to a continued fraction as its own upper bound 29.3(1991)228

Proposed by A.T. Benjamin, J. Crouch & J.A. Sellers

To: Suggestions for proving some Lucas identities by tiling methods 57.1(30)

Proposed by A.T. Benjamin, J.J. Quinn & J.A. Rouse

To: Find a combinatorial proof that Fibonomials are always integers, PIX (2004)23

Proposed by A.T. Benjamin & E. Reiland

1. To: Use combinatorial methods to prove several Fibonomial identities 52.5/PXV!(33)

Proposed by K.S. Berenhaut, E.M. Magargee & B.J. Stancil

- 1.2 To: Establishing cycles of solution to pairwise linear recursive equations PXIV(2011)52
- 2.20 To: Convergence of solutions to higher order pairwise linear recursive equations PXIV(2011)57
- 2.21 To: Convergence of solutions to higher order pairwise linear recursive equations PXIV(2011)57
- 2.22 To: Convergence of solutions to higher order pairwise linear recursive equations PXIV(2011)57

Proposed by K.S. Berenhaut, D.C. Morton & Y.W. Fan

To: What is a general form for the maximum possible value for the n th term of a k th ordered linear recurrence? PXI(2009)60

Proposed by G.E. Bergum & M. Bicknell-Johnson

1. To: Divisibility and generalized Fibonacci numbers, PII(1988)204
2. To: Largest perfect square in a generalized Fibonacci sequence, PII(1988)204
3. To: Triangular numbers in a generalized Fibonacci sequence, PII(1988)204
4. To: Complete generalized Fibonacci sequences, PII(1988)204
5. To: Roots of the characteristic equation of a certain generalized Fibonacci recursion relation, PII(1988)204

Proposed by G.E. Bergum & M.N. Deshpande

To: From various arrays find row sequences which satisfy the condition that if three consecutive terms in the row satisfy a given property, so will the fourth term PVI(1996)91

To: Generalize the results on arrays given in the article, PVI(1996)91

To: Prove the converse of two theorems on various arrays as presented in the given article PVI(1996)92

Proposed by V. Berthé, S. Brlek & P. Choquette

To: Prove an identity for the sequence of Fibonacci words PXI(2009)70

MISCELLANEOUS PROBLEM INDEX

Proposed by G. Berzsenyi

1. To: Pythagorean Triples, MRFS(1980)34
2. To: Diophantine Equation, MRFS(1980)34
3. To: Square terms in arithmetic progressions, MRFS(1980)34
4. To: Boxes of maximum volume and integral height, MRFS(1980)34
5. To: Fourth degree polynomials with extrema and inflection points with integral coordinates, MRFS(1980)34
6. To: Integral triangles, MRFS(1980)34

Proposed by S. Beslin

1. To: Ordered sets for which the determinant of the gcd-matrix is positive 29.3(1991)274
2. To: Factor-closed sets for which the determinant of the gcd-matrix is positive 29.3(1991)274
3. To: Ordered sets for which the determinant of the gcd-matrix is zero 29.3(1991)274

Proposed by S. Beslin & S. Ligh

To: GCD-Closed sets and k-sets 30.2(1992)160

Proposed by M. Bicknell (M. Bicknell-Johnson)

1. To: A Fibonacci Crostic, 9.5(1971)538; Corrections 10.2(1972)198
2. To: A Golden Double Crostic 16.1(1978)67
So: 16.1(1978)83
To: Finding nearly isosceles triangles, PIV(1991)50
To: finding the least integer having p Fibonacci representations (p prime) 40.3(2002)265

Proposed by D.P. Bighauser & G.A. Heuer

1. To: Investigate final digit sequences for various powers of integers 43.4(2005)350
2. To: Investigate final digit sequences for various powers of integers in bases 8 and 12 43.4(2005)350

Proposed by M.S. Boase

To: Investigating recursively defined integers and divisibility 39.5 (2001)391

Proposed by M.B. Boisen

1. To: Finding a generating function for extracting balls from an urn 7.2(1969)138
So: 7.2(1969)139
2. To: Non trivial left adjusted Pascal's triangle whose overlay determines a given sequence 7.2(1969)139

Proposed by Robert Booth & Hieu D. Nguyen

To: Redefine and find a formula for hypergeometric Bernoulli polynomials 46/47.1(2008-9)46

Proposed by J. Brillhart & E. Lehmer

To: Cubic congruence and Fibonacci numbers 9.5(1971)525

Proposed by P. Bruckman

To: Transformations and closed forms for functions defined by certain series representations, MRFS(1980)86

To: Suggested generalizations and related research into pseudoprimes 34.4(1996)340

1. To: Solve a given cubic 3-variable Diophantine equation PXII(2010)325
10. To: Questions about an inequality concerning the smallest element in a given set of numbers depending on prime numbers PXII(2010)329-30
10. To: Find the sum of the reciprocals of the entry points of a prime number; do the same for the squares of the entry points PXIII(2010)381

Proposed by O. Brugia & P. Filipponi

To: Finding Fibonacci and Lucas numbers of the form $n^2 - n - 1$, 37.3(1999)264

MISCELLANEOUS PROBLEM INDEX

Proposed by P.F. Byrd

P-1 To: Differential equation for Fibonacci polynomials 1.1(1963)28;
Correction, 2.2(1964)126

P-2 To: Bessel functions and Fibonacci numbers, 1.1(1963)28
So: Expansions of Bessel Functions in Terms of Fibonacci Numbers 2.2(1964)125

P-3 To: Reciprocal relation for Fibonacci polynomials, 1.1(1963)29
So: Inversion of Fibonacci Polynomial, 3.1(1965)46; 6.6(319)

P-4 To: Determinant for Fibonacci polynomials 1.1(1963)29

P-5 To: Rodriguez-type formula for Fibonacci polynomials 1.1(1963)29

Proposed by N.D. Cahill, J.R. D'Errico & J.P. Spence

To: Show the equivalence of Binet's formula and the complex trigonometric form for Fibonacci numbers 41.1 (2003)19

Proposed by N.J. Calkin, J.G. Stevens & D.M. Thomas

To: Analyzing various properties of the Ducci map 43.1(2005)57

Proposed by D. Callan

To: Conjectures and questions concerning divisibility properties of submodules of integer-valued functions 34.5(1996)298,299

Proposed by C.M. Campbell & P.P. Campbell

1. To: Resolve Wall's conjecture PXI(2009)101
2. To: Find a formula for the nth Wall number PXI(2009)101
3. To: Investigate infinite groups with finite Fibonacci length PXI(2009)101
4. To: Determine if families of groups exist that produce Fibonacci lengths that increase quadratically or exponentially PXI(2009)101

Proposed by C.M. Campbell, P.P. Campbell, H. Dootsie & E.F. Robertson

To: It is conjectured that if m is odd the Fibonacci length of the dihedral group $(D^2)_{2m}$ is equal to $8m$. PIX (2004)84

Proposed by P.J. Campbell & C. Moeller

1. To: Characteristic numbers of sequences, MRFS(1980)16
2. To: Characteristic numbers of sequences and L-factors, MRFS(1980)16
3. To: Powers of Brousseau numbers and sequences, MRFS(1980)16

Proposed by W. Carlip & E. Jacobson

To: Stability of two term recurrence sequences 34.4(1996)305

Proposed by L. Carlitz

- A. To: Evaluate the maximum of summands in a Fibonacci representation of n in terms of the canonical representation of n 8.2(1970)134
- B. To: Determine if the number of representations of n as a sum of Fibonacci numbers is 1, 8.2(1970)134
- C. To: Unimodular properties of the function for the number of representations of n as a sum of Fibonacci numbers 8.2(1970)134
- D. To: Logarithmic concavity of the function for the number of representations of n as a sum of Fibonacci numbers 8.2(1970)134
- E. To: Solving the equation setting the function for the number of representations of n as a sum of Fibonacci numbers 8.2(1970)134

Proposed by L. Carlitz & D.E. Knuth

3i To: Lucas product identity 12.1(1974)79;82

3ii To: Fibonacci product identity 12.1(1974)82

Proposed by M.Catral, P.L. Ford, P.E. Harris, S.J.Miller, D. Nelson, Z. Pan & H. Xu

To: Several questions relating to the number of legal decompositions by the Fibonacci quilt 55.3(2017)273

MISCELLANEOUS PROBLEM INDEX

Proposed by Z. Chen & J. Greene

To: Prove that a base 2-pseudoprime which is also Fibonacci pseudoprime exists
41.4(2003)343

To: Let m, n be relative prime; A, B disjoint sets of primes with no member dividing mn . Suppose that for each reduced residue class x of m and y or n , there are nonempty subsets S, T of A and U, V of B so that $f(S) \equiv x \pmod{m}$ and $f(U) \equiv y \pmod{m}$, $F(T) \equiv y \pmod{n}$ and $F(V) \equiv y \pmod{n}$. Then for each residue class z of mn , there is a subset W of $A \cup B$ such that $f(W) \equiv z \pmod{mn}$.
41.4(2003)343

Proposed by J.T.A. Christos, R.L. Ollerton & A.G. Shannon

To: Nine questions suggesting further study in the graph theoretic analysis of trellises
PXII(2010)252-3

Proposed by S.Z. Chun

To: Conjecture concerning power matrices 34.4(1996)296

To: Conjectures on certain sums from integral sets 34.4(1996)296,297

Proposed by E.A. Clark, R.A. Bateman, M.L. Hancock & C.A. Reiter (See R.A. Bateman)

Proposed by C. Cooper

4.1 To: Does every positive k -generalized Fibonacci-type sequence appear as a row in a k -Zeckendorf array? PXIV(2011)89 and as 3. PXIV(2011)280

Proposed by C.N. Cooper & R.E. Kennedy

To: Closed form for the sum of a series of digital sums, 29.2(1991)148

To: Largest space on a lottery ticket 29.4(1991)370

To: Find the closed form for a given summation and generalize 31.4(1993)344

To: Finding cycles in the RATS game, PVIII (1999)92

To: Proving John Conway's RATS conjecture, PVIII(1999) 92

Proposed by C. Cooper, R.E. Kennedy & M. Renberg

To: Finding closed forms for 5 number base digital sums 36.5(1998)414,415

Proposed by C. Cooper & S. Shattuck

To: Conway's conjecture for a RATS game 39.2 (2001)106

To: length of divergent RATS sequence 39.2 (2001)106

Proposed by C. Cooper & M. Wiemann (See under Wiemann)

Proposed by J. N. Cooper

1. To: Calculate the Hausdorff dimension of a certain set of reals 44.4(2006)301

2. To: Draw a connection between the above Hausdorff dimension and the asymptotic density of a set of integers related to bounded partial quotients in certain continued fractions 44.4(2006)301

Proposed by R.B. Corcino, L.C. Hsu & E.L. Tan

1. To: Constructing a generating function of some generalized Stirling numbers
44.2(2006)163

2. To: Establishing a vertical recurrence relation for some generalized Stirling numbers
44.2(2006)163

3. To: Determining linear relations between two kinds of generalized Stirling numbers
44.2(2006)164

Proposed by E. Crawford

1. To: Fibonacci congruence modulo 3^n , 12.1(1974)46

So: 12.1(1974)46;79

2. To: Integers having complete Fibonacci residues, 12.1(1974)79

MISCELLANEOUS PROBLEM INDEX

Proposed by J.W. Creely

1. To: Linear approximation of the log of a sum of numbers of modified greedy algorithm partitions of an integer 27.3(1989)257
2. To: Difference of sums of number of modified greedy algorithm partitions of an integer 27.3(1989)257
3. To: Number of prime factors of an integer having a negative difference of sums of the number of modified greedy algorithm partitions of an integer 27.3(1989)258
4. To: Negative differences of sums of the number of modified greedy algorithm partitions of n 27.3(1989)258
5. To: Modified greedy algorithm congruence and summation identity 27.3(1989)258

Proposed by J. Crouch, J.A.Sellers & A.T. Benjamin, (See under Benjamin)

Proposed by G. Darvasi & M. Nagy

To: Researching general sequences and frequency blocks for various recurrence relations 34.2(1996)180

Proposed by R. Dawson, G. Gabor, R. Nowakowski & D. Wiens

1. To: Limiting distributions of certain random Fibonacci-type sequences 23.2(1985)175
2. To: Infinite sets and certain random Fibonacci-type sequences 23.2(1985)176

Proposed by L. Dazheng

To: Search for Fibonacci matrices of order 4 and higher 37.1(1999)20

Proposed by M.Catral, P.L. Ford, P.E. Harris, S.J.Miller, D. Nelson, Z. Pan & H. Xu

To: Several questions relating to the number of legal decompositions by the Fibonacci quilt 55.3(2017)273

Proposed by T.P. Dence

1. To: Monotone strings of ratios of generalized Fibonacci sequences, 25.2(1987)142
2. To: Strings of specific length for ratios of generalized Fibonacci sequences 25.2(1987)142
3. To: Increasing and decreasing strings for ratios of generalized Fibonacci sequences 25.2(1987)142

Proposed by A.J. DiScala & M. Sombra

To: Determining the density of k-palindromic numbers in various bases 42.1(2004)80

Proposed by U. Dudley & B. Tucker

To: Nine Fibonacci-Lucas identities, 9.1(1971)91

Proposed by A. Dujella

To: Extension of certain properties of Diophantine quadruples to Diophantine quintuples 34.2(174)

To: Existence of a quintuple satisfying the property of Diophantus PVII(1998)67

Proposed by B. Dular

To: Several open questions concerning cycles of sums of integers 58.2 (2020)139

Proposed by E.J. Eckert & P.D. Vestergaard

1. To: Variations on the group structure for the group of integral triangles having one fixed angle as that angle varies 27.5(1989)463
2. To: Description of the isomorphic classes of the group of integral triangles having one fixed angle 27.5(1989)463
3. To: Isomorphic groups of integral triangles having one fixed angle 27.5(1989)463
4. To: Properties of Pythagorean triangles for triangles in the group of integral triangles having one fixed angle 27.5(1989)463

Proposed by the Editor

To: Research Project: Fibonacci Nim 1.1(1963)63

So: Fibonacci Nim 1.4(1963)9

MISCELLANEOUS PROBLEM INDEX

Proposed by M. Elia

- To: Searching for invariant sequences under transformations induced by automorphisms of certain quadratic fields, PVII(1998)92
- To: Integer representation by cubic forms 39.2 (2001)115

Proposed by M. Elia & J.C. Interlando

1. To: In m -dimensional space determine whether the maximum center density is achievable finitely or asymptotically 41.3 (2003)287
2. To: Determine if the theta series of a Fibonacci ideal lattice can be expressed in terms of a finite initial set of theta series 41.3 (2003)288

Proposed by E.I. Emerson

1. To: Solving Pell equations 7.3(1969)239
2. To: Solving Pell equations 7.3(1969)239
3. To: Recurrence relations for solutions to certain Pell equations 7.3(1969)239
4. To: Congruence relation for solutions to certain Pell equations 7.3(1969)240
5. To: Summation formulas for solutions to certain Pell equations 7.3(1969)240
6. To: Recurrence relations for solutions to certain Pell equations 7.3(1969)240

Proposed by H. Erickson & M. Jonsson

- To: Extending some results of the Bulgarian solitaire game to all cases 55.3(2017)250
- To: Some problems on cycle partitions of non-triangular numbers 55.3(2017)250

Proposed by L. Erickson

2. To: Determining if given necessary & sufficient conditions that guarantee that certain numbers relating to 2^{nd} order recurrence sequences are prime are true PXII(2010)325-6
5. To: Seek a k -tuple whose elements are the difference between primes and members of a set of even integers PXIII(2010)378

Proposed by B. Essebbbar

- To: Find a combinatorial solution to a double indexed n th order difference equation 41.4(290)

Proposed by E. Fang, J. Jenkins, Z. Lee, D. Li, E. Lu, S.J. Miller, D. Salgado & J.M.Siktar

- To: Five problems relating to paths in a two-dimensional lattice 58.3(2020)220

Proposed by P. Filipponi

- To: Proof of a Pell-Lucas identity, 33.3(1995)257
- To: Determining summation formulas for some Horadam sequences 35.1(1997)61
- To: Proof of a Lucas identity 36.1(1998)63

Proposed by P. Filipponi & H.T. Freitag

- To: Hyperbolic function matrix identity, PIV(1991)97
- To: Hyperbolic function summation identity, PIV(1991)98
- To: Hyperbolic function identity, PIV(1991)98
- To: Establish divisibility and primality properties for the elements of Fibonacci autocorrelation sequences 32.4(1994)368

Proposed by P. Filipponi & A.F. Horadam

- To: Identities to be discovered from the Cholesky decomposition matrix 29.2(1991)173
- i. To: Simson formulas, PV(1993)329
- ii To: Pell and Pell-Lucas integration sequences, PV(1993)330
- iii To: Double integration sequences, PV(1993)330
- To: Several conjectures and identities related to derivative sequences of Fibonacci and Lucas polynomials are offered for examination. 31.3(1993)203
- To: An extension of a development on derivative sequences of Fibonacci and Lucas polynomials to Pell and Pell-Lucas polynomials is suggested. 31.3(1993)204
- To: Several questions on partial derivative sequences of the second order are considered, PVI(1996)121

MISCELLANEOUS PROBLEM INDEX

Proposed by P. Filipponi & A.F. Horadam

To: Closed form reciprocal sum of Jacobsthal integration function of triangular numbers PVIII(1999)137

Proposed by P. Filipponi & R. Menicocci

To: Consider various probabilistic aspects of the terminal digits of the Lucas sequence 33.4(1995)330

To: Find the probability that a random Fibonacci number and a random Lucas number have the same terminal digit 33.4(1995)330

Proposed by H.T. Freitag & G.M. Phillips

To: Congruence relation for a general $(m+1)^{\text{th}}$ order recurrence relation, PII(1988)43

To: Seeking efficient algorithms for Zeckendorf arithmetic, PVII(1998)132

Proposed by C.P. French

To: Finding the number of 1's in the continued fraction expansion of various Fibonacci ratios of the form $(F_{n+k} / F_n)^{1/k}$ 44.3(2006)215

Proposed by D.D. Frey & J.A. Sellers

To: Closed form for the sum representing the generalization of Bailey's generalized Catalan numbers 39.2 (2001)147

To: Proof of a summation formula for the sum representing the generalization of Bailey's generalized Catalan numbers 39.2 (2001)148

Proposed by R. Frontczak

To: Find a general identity that have sums of two and three factors of combinations of Fibonacci, Lucas, Tribonacci and Tribonacci-Lucas numbers as special cases 56.3(274)

Proposed by C. Georghiou & A.N. Philippou

To: Closed form for the sum of a series involving the harmonic sequence and the Riemann zeta function 21.1(1983)36

Proposed by I.M. Gessel & T. Lengyel

To: order of divisibility properties for Stirling numbers of the second kind 39.5 (2001)453,454

Proposed by A. Gica

To: Conjecture on the existence of a sequences satisfying a congruence modulo a prime 46/47.1(2008-9)72

Proposed by F.S. Gillespie

To: Kummer congruences obtained from various LCM-partitions 30.4(1992)365

Proposed by H. Glaser & G. Schöfl

To: Several questions concerning Ducci sequences are proposed 33.4(1995)323

Proposed by C. Giuli & R. Giuli

To: Form for Stern's diatomic sequence, $s(n, (2r+1)2^m)$ 17.4(1979)320

Proposed by I.J. Good

To: Skew circulant of a particular matrix 24.1(1986)48

i. To: Norms of Cyclotomous integers 24.1(1986)54

ii . To: Norms of Cyclotomous integers 24.1(1986)54

iii. To: Products of skew circulices 24.1(1986)54

iv. To: Norms of Cyclotomous integers 24.1(1986)54

v. To: Norms of Cyclotomous integers and triangular numbers 24.1(1986)54

vi . To: Representation of the square of certain integers 24.1(1986)54

To: Expressibility of integers as skew circulants of order 4, 24.2(1986)177

To: How much of a theory of complex Fibonacci & Lucas numbers considered for Gaussian integers of the form $a+ai$ is valid for Gaussian integers of the form $a+bi$? 31.1(1993)19

To: Under what conditions is a pseudoprime as described in the article a prime? 31.1(1993)19

MISCELLANEOUS PROBLEM INDEX

Proposed by H.W. Gould

To: A Fibonacci crossword puzzle 4.1(1966)59
So: 4.2(1966)150

Proposed by H.W. Gould, J.B. Kim & V.E. Hoggatt, Jr.

To: Generating function for base 10 coding numbers 15.4(1977)312

Proposed by H.W. Gould & J. Quaintance

1. To: Provide combinatorial proofs for Vosmansky identities 48.1(2010)60
2. To: Find q-analogues and determine their combinatorial meaning for Vosmansky identities 48.1(2010)60
3. To: Find 2 or 3 variable generalizations for Vosmansky's identity 48.1(2010)60

Proposed by M.B. Gregory & J.M. Metzger

To: Sequences of sines whose argument is the general term of a recurrence relation 16.2(1978)120

Proposed by M. Griffiths & A. Bramham

1. To: Find a combinatorial proof of an identity for the Lucas-jacobsthal convolution 53.2(2015)1478
2. To: Find a mathematical explanation for the inclusion of all the Jacobsthal-complete moduli into the set of all Lucas-complete moduli 53.2(2015)150

Proposed by G.A.R. Guillot

1. To: Sums of arctangents of reciprocals of Fibonacci numbers 15.3(1977)232
- 2a. To: Lower bounds for sums of Fibonacci reciprocal expressions 15.3(1977)232
- 2b. To: Lower bounds for sums of Fibonacci reciprocal expressions 15.3(1977)232
- 3a. To: Sums of arctangents of Fibonacci rational expressions-numbers 15.3(1977)257
- 3b. To: Sums of arccosines of Fibonacci rational expressions-numbers 15.3(1977)257
- 3c. To: Sums of arcsines of Fibonacci rational expressions-numbers 15.3(1977)257
4. To: Finding expressions whose sums equal the difference between a Fibonacci number and the sum of primes that Fibonacci number 15.3(1977)257

Proposed by R.K. Guy & W.O.J. Moser

To: Researching congruence and divisibility properties of subsequences of integers whose odd (even)members have at least one odd (even) neighbor 34.2(1996)155

Proposed by H.S. Hahn

To: Polynomial mappings from the set of ordered pairs of positive integers to the set of positive integers 10.6(1972)628

Proposed by N. Hamlin & W.A. Webb

To: If a sequence does not satisfy a positive recurrence, can an integer, N be uniquely be represented in a general Zeckendorf expansion? 50.2(2012)105

Proposed by S. Haque & J.Shallit

To: What sequence shave shift-invariant discriminators 57.1(8)

Proposed by H. Harborth

To: Checkerboard games and mosaic graphs, PIII(1990)127

To: Polyominoes and (p,q)-mosaic graphs, PIII(1990)127

To: Smallest number of edges of a (p,q)-mosaic tessellation, PIII(1990)127

To: Smallest number of edges of a Fibonacci tessellation, PIII(1990)127

[Note: $N_b(k)$ and $N_F(k)$ are the maximum number of levels of realizable b-adic and Fibonacci trees, respectively, in edge to edge packings of regular k-gons in the plane and $S(k)$, the smallest number of vertices of certain non extenable trees.]

1. To: $N_3(\infty) \leq 2$, PV(1993)274
2. To: $N_2(\infty) \leq 5$, PV(1993)275
3. To: Minimal k for which $N_2(k) = 4$ and 5; and $N_3(k) = 2$, PV(1993)275

MISCELLANEOUS PROBLEM INDEX

Proposed by H. Harborth

4. To: Maximal k for which $N_2(k) = 4$ and $N_3(k) = 1$, PV(1993)275
5. To: $N_F(\infty) \leq 10$, PV(1993)276
6. To: Minimal k for which $N_F(k) = 8, 9$ and 10 , PV(1993)276
7. To: Maximal k for which $N_F(k) = 5, 6, 7, 8$ and 9 , PV(1993)276
8. To: Minimal k for which $S(k) = 10$, PV(1993)276
9. To: Maximal k for which $S(k) > 10$, PV(1993)276
3. To: Determine the minimum number of 0's in a 0-1 matrix that will guarantee that no 1 has 4 neighboring 1's PXII(2010)326
4. To: Determine the number of 0-1 matrices that contain a 2x2 submatrix with 0's only PXII(2010)326
5. To: Determining if a given sequence can be written into an edge-to-edge sequence of hexagons so that the sum satisfies a given function PXII(2010)326-7
1. To: Find all n such that the base 10 reversal of 2^n is prime PXIII(2010)377
2. To: For arbitrary k , find all $n > 1$ such that the sum of the digits of n^k equals n PXIII(2010)377)
6. To: For $n > 2$, does there exist a fair magic (hexagon) board? PXIII(2010)378-9
7. To: For an n -dimensional cube with colored vertices, what is the minimum number of colors needed so that each path along the edges uses one color an odd number of times? PXIII(2010)379)
4. To: A conjecture of H-D. Gronau and M. Krüppel concerning Pascal's triangle modulo a prime p , PXIV(2011)281
6. To: Find a formula for the maximum number of 0's in an $n \times n$ zero-one matrix such that every 0 has at most 3 neighboring 0's (in row and columns, PXIV(2011)281
7. To: Find the area of the convex hull of an edge to edge pentagonal packing and also the minimal area of the convex hull for n regular pentagons, PXIV(2011)282

Proposed by H. Harborth & S. Jäger

To: Finding mosaic numbers, PIV(1991)132

Proposed by H. Harborth & A. Kemnitz

To: Existence of Fibonacci triangles, PIII(1990)131

To: Smallest dimension for which the Fibonacci representation of a complete graph exists, PIV(1991)138

Proposed by H. Harborth & S. Lohmann

To: General estimates for mosaic numbers of a Fibonacci tree, PIII(1990)136

Proposed by H. Harborth & M. Möller

To: Existence of an infinite number of integral combinatorial boxes, PVII(159)

Proposed by H. Harborth & L. Piepmeyer

To: Diameters of two distance sets and the golden ratio, PV(1993)287

Proposed by P. Haukkanen

To: Multiplicative functions and k -ary convolutions 38.5 (2000)444

Proposed by R.J. Hendel

To: Prove a generalization of a Fibonacci summation identity 45.2(2007)131

To: Given the 2nd order recursion $G_n = ca^n + db^n$ with a, b, c, d real, $cd \neq -1$, $a > 0$ and $\max\{1, |b|\} < a$:

1. To: Are there an infinite number of quadruples $\{a, b, c, d\}$ whose periods have a given length? 49.1(2011)44
2. To: For which quadruples and how frequently are the sums of the periods 0? 49.1(2011)44
3. To: Characterize the quadruples and frequency of those having antisymmetric periods of having single max-min sets. 49.1(2011)44

MISCELLANEOUS PROBLEM INDEX

Proposed by R.J. Hendel

4. To: Find parametrically defined infinite subsets of quadruples having periods exhibiting patterns similar to those of continued fractions of quadratic irrationals. 49.1(2011)44
- 1.. To: Describe the compliment of the range of Kimberling's function 48.3(2011)219
- 2.. To: Describe all n such that Kimberling's function has infinitely many solutions 48.3(2011)219
- 3.. To: Prove that the set of values not in the range of Kimberlin's function has positive density and find that density 48.3(2011)219
- 4.. To: Find and prove theorems relating to Kimberlin's function 48.3(2011)219
To: Two questions about identities generated by the Tagiuri Generation Method PXVII(84,85)

Proposed by M.M. Herreshoff

To: Try to find nice answers to various sums of products of powers and Fibonacci numbers
PXII(2010)184-185

Proposed by C.J. Hillar & T. Windfeldt

1. To: Is there a graph coloring proof of Cassini's identity? 46/47.3(2008-9)224

Proposed by R. Hochberg & G. Hurlbert

1. To: Prove that for every $n \geq 3$ there are infinitely many Pythagorean n -tuples, PIX (118)
2. To: Characterize primitive Pythagorean n -tuples having three parameters, PIX (118)
3. To: Determine if there exists infinitely many n for which there exists a nested Pythagorean n -tuple, PIX (118)
4. To: Determine if there exists any n for which there exists infinitely many nested Pythagorean n -tuples, PIX (119)
5. To: Classify all primitive Pythagorean n -tuples of surd 1, PIX (119)
6. To: Various questions about Pythagorean 4-tuples having common geometric properties
PIX (119)

Proposed by V.E. Hoggatt, Jr.

1. To: Row sums of Pascal's triangle 8.2(1970)168
2. To: Fibonacci convolution triangle and Pell numbers 8.2(1970)168
3. To: Fibonacci convolution triangle and the sequence of powers of three 8.2(1970)168
4. To: Convolution triangle for powers of three and alternate Fibonacci numbers 8.2(1970)168
5. To: Fibonacci convolution triangle for every third Fibonacci number 8.2(1970)179

Proposed by A. Holshouser, H. Reiter & J. Rudzinski

To: If $L(n)$ is the smallest possible winning move in a certain one pile dynamic Nim game, the $L(L(n)) = L(n)$ 41.3 (2003)261

Proposed by J.M. Holte

To: Compute the Fibonomial coefficients modulo certain primes 32.1(1994)63

Proposed by A.F. Horadam

To: Generalization of Delannoy's "arithmetical square" 16.1(1978)36
To: Three Diophantine equations of Master Theodorus taken from Liber quadratorum 29.2(1991)106
To: Jacobsthal numbers and Asveld polynomials, PIII(1990)153
To: Falling factorial, Pell, Pell-Lucas and Jacobsthal polynomials, PIII(1990)153
To: The life and mathematical works of Angelo Genocchi, PIV(1991)165
To: Find a negative subscript Simson analogue of a Simson formula for the sums of generalized Pell numbers 32.5(1994)435
To: Justify the name Eudoxus numbers for Pell & Pell-Lucas numbers 32.5(1994)440
To: Researching various MinMax polynomials and numbers 34.1(16)
To: Researching Jacobsthal numbers and polynomials 34.1(53)
To: Researching extensions of various polynomials 34.1(74)
To: Researching extensions of properties of Jacobsthal polynomials 35.2(148)

MISCELLANEOUS PROBLEM INDEX

Proposed by A.F. Horadam

- To: Researching properties of diagonal functions relating to generalizations of Morgan-Voyce polynomials 35.3(239)
- To: Questions concerning Jacobsthal polynomials and gamma functions 35.4(370)
- To: Divisibility applications of minmax sequences of Pell numbers, PVI(1996)248
- To: Finding relationships for Morgan-Voyce numbers and between them and Brahmagupta polynomials 37.4(1999)324
- To: Finding differential equations for rising diagonal functions of quasi Morgan-Voyce polynomials, PVIII 193
- To: Investigating properties for the general case of Jacobsthal and Jacobsthal-Lucas convolution polynomials 40.3(2002)222
- To: Discovering properties of divisibility and of rising and falling diagonals for Vieta-Fibonacci and Vieta-Lucas polynomials 40.3(2002)231
- To: Discovering properties of convolutions for Vieta-Fibonacci and Vieta-Lucas polynomials 40.3(2002)232
- To: Obtaining sets of Vieta numbers from Vieta-Fibonacci and Vieta-Lucas polynomials 40.3(2002)232
- To: Investigate rising and falling diagonal convolution polynomials for Chebyshev polynomials 43.2(2005)121

Proposed by A.F. Horadam, R.P. Loh & A.G. Shannon

- To: Solutions of a functional equation, PIV(1991)276

Proposed by A.F. Horadam & A.G. Shannon

- To: Investigating modular lambda triangles 40.5 (2002)415

Proposed by F.T. Howard

- To: Highest power of a prime dividing numbers generated by a rational power of a generating function 39.4 (2001)364

Proposed by D.F. Howells & J.C. Pond

1. To: Unsafe moves in Fibonacci Nim 3.1(1965)62
 2. To: Formulas for unsafe Fibonacci Nim moves 3.1(1965)62
 3. To: Difference of Fibonacci Nim unsafe moves 3.1(1965)62
 4. To: Density of Fibonacci Nim unsafe moves 3.1(1965)62
 5. To: Probability of winning in Fibonacci Nim 3.1(1965)62
1. To: Closed form for unsafe moves in Fibonacci Nim 3.1(1965)62
 2. To: Limiting density in the positive integers of the number of unsafe moves in Fibonacci Nim 3.1(1965)63

Proposed by L.C. Hsu

1. To: Horizontal recurrence relations for generalized Stirling number pairs 25.4(1987)349
2. To: Asymptotic expansions for GSN pairs 25.4(1987)349
3. To: Asymptotic normality and GSN pairs 25.4(1987)349
4. To: Extension of GSN pairs to multiparameters 25.4(1987)349

Proposed by M. Jaidee & P. Pongsriiam

- To: Various questions concerning arithmetic functions of Fibonacci and Lucas numbers 57.3(2019)252

Proposed by J.A. Jeske

- P-1 To: Solving the Lucas recurrence relation 1.2(1963)74
- P-2 To: Exponential generating function for the solution of a recurrence relation 1.2(1963)74

MISCELLANEOUS PROBLEM INDEX

Proposed by J.P. Jones

- To: Singlefold Diophantine set of Fibonacci numbers, PIII(1990)201
- To: Non-Fibonacci numbers and Diophantine sets in two unknowns, PV(1993)392
 - To: Non-Fibonacci numbers and Diophantine sets in three unknowns, PV(1993)392
 - To: Non-Fibonacci numbers and single fold Diophantine sets, PV(1993)392
- A. To: Cyclic underlying algebras of Fibonacci varieties, PV(1993)394
- B. To: Cyclic branch covers over knots, PV(1993)395
- C. To: Dual Fibonacci manifolds, PV(1993)396
- D. To: Dual Fibonacci manifolds and branched covers over knots, PV(1993)396
- To: Solutions to an equation involving Euler's totient 28.2(1990)165
 - To: Solutions to an equation involving Euler's totient 28.2(1990)165
- To: Nonsimple numbers and reduced ϕ -partitions 29.4(1991)350

Proposed by M.A. Kahn & H. Kwong

To: Classify all perfect squares of the form $2n^2 + a$ according to the value of a 43.2(2005)102

Proposed by S. Kahan

To: Generating mutual counting sequences 18.1(1980)50

Proposed by C. Kimberling

- To: Maximum number of terms common to two sequences of a specific type PIV(1991)188
- To: Complete Stolarsky arrays, PV(1993)412
 - To: Lexicographically ordered justified arrays, PV(1993)413
 - To: Justified arrays, PV(1993)414
 - To: Stolarsky arrays, PV(1993)416
 - To: Stolarsky arrays, PV(1993)416
 - To: Stolarsky arrays and Stolarsky interspersion, PV(1993)416
 - To: Non-Fibonacci numbers and Stolarsky interspersion, PV(1993)416
 - To: Stolarsky interspersion, PV(1993)416
 - To: Stolarsky interspersion, PV(1993)416
 - To: Dual Stolarsky array, PV(1993)416
 - To: Complete Stolarsky arrays and Stolarsky interspersion, PV(1993)416
- To: Investigation of palindromic sequences 36.2(1998)173
- To: Upper symbiotic number of two linearly-ordered sets 39.4 (2001)372
- To: array patterns for number of paths function 39.5 (2001)432
- To: Prove that a pair of Fibonacci numbers satisfy a give quadratic equation PXII(327)
 - To: Prove that the lower Wythoff sequence solves a given complementary equation PXIII(381)
5. To: Prove or disprove that every positive integer can be written as $([nr] + n - 1)/F_{2k}$ for some positive integers n and k . PXIV(2011)281

Proposed by W.F. Klostermeyer, M.E. Mays, L. Soltes & G. Trapp

To: Conjectures about the properties of Pascal's rhombus 35.4(327,328)

Proposed by A. Knopfmacher & J. Knopfmacher

To: Metrical properties of alternating product expansion of real numbers, PIII(1990)215

To: Continued fraction expansion of maximum length for Legendre, Hermite and Chebyshev (second kind) polynomials, PIII(1990)221

Proposed by S.W. Knox

To: Nonsimple k -nacci sequenceable groups 30.2(1992)120

Proposed by T. Koshy & Z. Gao

To: Combinatorially interpret non-linear 1st order recurrence relations 55.1(2017)20

Proposed by V. Krčadinac

To: Finding formulas fo lower Fibonacci numbers 44.4(2006)339

MISCELLANEOUS PROBLEM INDEX

Proposed by S.T. Kuhn & A. Vogt

1. To: Strings of digits 30.1(1992)52
2. To: Necessary and sufficient conditions that the digit one does not appear in a rightmost string of digits of an integer 30.1(1992)52
3. To: Upper bounds for length of rightmost string of digits, not having a one digit, for an integer 30.1(1992)52
4. To: Appearance of ones in a digit string 30.1(1992)53

Proposed by P. Lafer

1. To: Relationship between square-triangular numbers and members of a sequence satisfying a given recurrence relation 9.1(1971)104
2. To: Necessary and sufficient conditions that a square-triangular number be odd 9.1(1971)104
3. To: Binet-type formulas for square-triangular numbers 9.1(1971)104
4. To: Nonlinear recurrence relation related to square-triangular numbers 9.1(1971)104
5. To: Square-triangular numbers and recurrences 9.1(1971)104
6. To: Recurrence relations related to square-triangular numbers 9.1(1971)104
7. To: Binet-representations for general terms of sequences related to square-triangular numbers 9.1(1971)104
8. To: Square-triangular numbers as solutions to Pell equations 9.1(1971)104

Proposed by J. Lahr

- To: Determining initial conditions for peaks of equal magnitude in a Fourier transform, PIII(1990)237
8. To: Prove that the area of a sequence of given triangles converges to one half the golden ratio PXII(328-9)

Proposed by P.J. Larcombe & E.J. Fennessey

To: Solving observations made from a 3rd order Horadam recurrence relation 55.2(2017)175

Proposed by S. Legendre

1. To: Construct labeled trees for triangle numbers, sequences of powers of 2, Perrin numbers, Perrin-like numbers, Tribonacci numbers and k-bonacci numbers 53.2(2015)167

Proposed by R.Li & S.J. Miller

To: Three questions concerning the central limit theorem for gaps of generalized Zedkendorf decompositions 57.3(2019)229

Proposed by C.T. Long

To: Biquadratic binomial identities, PIII(1990)254

1. To: Finding gcd's in numbered convex hexagons entries in Pascal's triangle, PXIV(2011)279

Proposed by F. Luca

7. To: Questions concerning the smallest integer which guarantees only a finite number of solution to a recursion involving the sum of divisors functions PXII(328)

Proposal by F. Luca & S. Laszlo

To: Show that $\log f(x)/\log x$ tends to $3/2$ as x approached infinity, where $f(x) = \#\{(a,b,c) \in \mathbf{Z}^3: a>b>c \geq 1, \max\{\|ab\|_F, \|ab\|_F, \|ab\|_F\} \leq x; \text{ and } \|x\| \text{ is the distance from } x \text{ to the closest Fibonacci number. } 51.3(2013)231$

MISCELLANEOUS PROBLEM INDEX

Proposed by F. Luca & S. Porubský

1. To: Bounds for the cardinality of subgroups generated by Lehmer numbers
41.2 (2003)130
2. To: Prove that the torsion group of the factor group generated by Lehmer numbers is finite 41.2(2003)131
3. To: Prove that if the intersection of two Lehmer sequences is infinitely generated, then the intersection of the two corresponding range sequence is infinite
41.2 (2003)131

Proposed by F. Luca & P. Stănică

To: Prove that a diophantine representation for a Lucas sequence with complex conjugate roots has only finitely many integral solutions PXI(183)

Proposed by C. Lucheta, E. Miller & C. Reiter

To: Researching control on certain digraphs 34.3(239)

Proposed by A.L. Ludington

To: Form of tuples for games of maximum length 26.3(1988)203

Proposed by J.S. Madachy

1. To: Expressing Fibonacci numbers using the ten digits only once and only the common mathematical operations and symbols 6.1(1968)60
So: 6.2(1968)162
2. To: Finding multiples of 6 using all nine non zero digits only once 6.1(1968)61
3. To: Finding multiples of 6 using all ten digits only once, 6.1(1968)61
4. To: Finding $P^n = N$ where the sum of the digits in N is equal to n 6.1(1968)64
5. To: Exploring the sequence where each term is the sum of the next two terms 6.1(1968)67
So: 6.4(1968)299
6. To: What Fibonacci numbers are integral multiples of the sums of their digits? 6.1(1968)67
7. To: Finding $F_n = N$ where $N = nk$, 6.1(1968)67
8. To: Finding irregular patterns of the twelve pentominoes which form tessellation patterns 6.2(1968)164
9. To: Finding normal or reasonably normal Fibonacci numbers 6.2(1968)165
10. To: Proving that magic squares using consecutive Fibonacci numbers cannot be constructed 6.2(1968)166
So: 6.4(1968)301
11. To: Fibonacci continued fraction 6.6(1968)385

Proposed by K-H Mak

To: Find all vanishing Ducci sequence d - tuples for general d 50.4(2012)332

Proposed by D. Marques

To: Four conjectures concerning inequalities for the order of appearance (apparition) of Lucas numbers 50.1(2012)43

Proposed by D. Marques & P. Trojovoský

To: Three conjectures on identities involving positive and negative summands of sums of Fibonomials and products of fibonacci and Lucas numbers 50.2(2012)161

Proposed by O.W. McClung

1. To: Generator of unitary amicable numbers 23.2(1985)164
2. To: Non generator of unitary amicable numbers 23.2(1985)165

MISCELLANEOUS PROBLEM INDEX

Proposed by W.L. McDaniel

1. To: k^{-1} -Smith numbers 25.1(1987)79
2. To: 2^{-1} -Smith numbers 25.1(1987)79
3. To: k^{-1} -Smith numbers 25.1(1987)79
1. To: Powerful Smith numbers 25.3(1987)227
2. To: k -Smith numbers as n^{th} powers of integers, 25.3(1987)227
3. To: Consecutive k -Smith numbers 25.3(1987)227
4. To: Representing integers as differences of k -Smith numbers 25.3(1987)227
5. To: Frequency of powerful Smith numbers 25.3(1987)227
6. To: Representing integers as differences of powerful k -Smith numbers 25.3(1987)227
To: Factorization technique for the Fibonacci numbers 39.3 (2001)210

Proposed by D.G. Mead

To: Finding a closed form formula for the sum of the first n terms of a given sequence 3.3(1965)213

Proposed by R.S. Melham

1. To: Find a general pattern of polynomials occurring in sums of Fibonacci and Lucas powers 46/47.4(2008/2009)314
2. To: Determine if the above polynomials are irreducible over the rational numbers 46/47.4(2008/2009)314
3. To: Exploring properties of sums of powers of Fibonacci and Lucas numbers 46/47.4(2008/2009)315
To: Verify two identities of powers of Fibonacci numbers 48.3(2010)259
To: Construct any number of identities involving powers of Fibonacci numbers based on given conjectures about such identities 48.3(2010)259

Proposed by S.J. Miller & A. Newlon

To: Several questions concerning the Fibonacci quilt game. 58.2(2020)167

Proposed by S. Mohanty

To: Finding numbers not in a multi-set without constructing the multi-set 29.2(1991)113

Proposed by S. Mohanty & S.P. Mohanty

1. To: Maximum length of an arithmetic progression of Pythagorean numbers 28.1(1990)39
2. To: Sufficient condition that an integer be independent of a Pythagorean number 28.1(1990)41
3. To: Integers which are twice a Pythagorean number 28.1(1990)41
4. To: Integers which are thrice a Pythagorean number 28.1(1990)41
5. To: Pythagorean triangles having the same area 28.1(1990)41

Proposed by G.A. Moore

To: Find the limit of a sequence of maximal roots of various Fibonacci polynomial sequences 32.3(1994)217

Proposed by T.E. Moore

To: Position of a value within the division count cycle related to the number of divisions needed in the Euclidean algorithm 27.4(1989)295

To: Rule for governing consecutively repeated division count values within a cycle 27.4(1989)295

Proposed by W. More

To: Some open problems on the Lucas Discriminant probable prime test, PVII(288)

MISCELLANEOUS PROBLEM INDEX

Proposed by P. Moses

3. To: For $m > 2$ find a closed form for any column of the m -order Zeckendorf array PXIII(377)
8. To: Questions concerning n -gons constructed on the sides of a given triangle PXIII(379-80)

Proposed by W.B. Müller & A. Oswald

1. To: Test for strong Dickson pseudoprimes, PV(1993)462
2. To: Strong c -Dickson pseudoprimes, PV(1993)462
3. To: Prime factors of strong c -Dickson pseudoprimes, PV(1993)462
4. To: Number of strong c -Dickson pseudoprimes, PV(1993)463
5. To: Tests for non-superstrong Dickson pseudoprimes, PV(1993)463
6. To: Numbers of tests for non-superstrong Dickson pseudoprimes, PV(1993)463

Proposed by A.O. Munagi

- To: Generalizing k -combinations to sets of positive integers with x separations 45.2(114)
2. To: Find the number of self-disjoint partitions of an integer n , PXIV(2011)279

Proposed by D.K. Neal

- To: Characterizing parameters initiating patterns for approximating golden number 45.1(2007)38

Proposed by S. Northshield

- To: Prove that the row sums in the Gould sequence array are $2(3^{n-1})$ PXII(38)
- To: Derive the recurrence relation for a sequence of hyperbinary representations PXII(46)
- To: Five questions concerning topographs PXIX(189)

Proposed by M.A. Nyblom

- To: Set inclusion of sets of polygonal numbers 39.3 (2001)263
- To: For any sequence U_n of solutions of higher order recurrences generated with respect to relatively prime coefficients, $(U_m, U_n) = U_{(m,n)}$ 41.2 p155

Proposed by R.L. Ollerton & A.G. Shannon

- To: Investigating properties and applications of generalized binomial coefficients PIX (187)

Proposed by Padmavathamma

8. To: Combinatorial proof of an equation involving functions related to F -partitions 27.2(1989)130

Proposed by G.K. Panda & A.K. Panda

1. Verifying six identities involving the solutions of certain Pell equations 52.5/PXV!(194-5)

Proposed by G.K. Panda & S.S. Pradham

- To: Two conjectures on cobalancing numbers 57.4(2019)362

Proposed by A. Patra & G.K. Panda

- To: Investigating conditions under which a certain diophantine equation can be solved 58.1(2020)16

Proposed by C.N. Phadte & S.P. Pethe

- To: Find 7 identities for sums of generalized circular functions PXV(2013)210

Proposed by A. Philipou

11. To: Evaluate the sum of reciprocals of Fibonacci numbers of order k PXIII(381-2)
12. To: Find values for which the Poisson distribution of order k attains a maximum PXIII(382-3)

Proposed by C. Pomerance

- To: \$620 prize problem concerning the Lucas sequence PXIII(306)

MISCELLANEOUS PROBLEM INDEX

Proposed by H. Prodinger & R.F. Tichy

- 4.1 To: Fibonacci number of a lattice graph 20.1(1982)20
- 4.2 To: Fibonacci number of a cube 20.1(1982)20
- 4.3 To: Fibonacci number of a Peterson graph 20.1(1982)20
- 4.4 To: Lower bound for the Fibonacci number of a planar graph 20.1(1982)20
- 4.5 To: Existence of a sequence of graphs with specified Fibonacci numbers 20.1(1982)20

Proposed by S. Rabinowitz

1. To: Summing reciprocals of products of Lucas numbers 37.2(1999)126
2. To: Find the sum of reciprocals of $(f_n)^2$ 37.2(1999)126
3. To: Finding algebraic relations for reciprocal sums of Fibonacci and Lucas products 37.2(1999)127

Proposed by Br.L. Raphael

4. To: Constructing parallelograms 10.4(1972)423
10. To: Polygons and a recurrence relation with Fibonacci coefficients 10.4(1972)424
12. To: Fibonacci-golden number inequality 10.4(1972)424
16. To: Asymptotes of Patton polygons 10.4(1972)425
18. To: Asymptotes and T-shaped polygons 10.4(1972)426
20. To: Asymptotes and "hyperbola" shaped polygons 10.4(1972)427
21. To: Asymptotes and Patton polygons with odd-numbered subscripts 10.4(1972)427
24. To: Polygons, unit squares and asymptotes 10.4(1972)427

Proposed by D.A. Rawsthorne

1. To: Formula for the number of good sequences derived from a given sequence 25.2(1987)162
2. To: Limit problem related to the number of good sequences derived from a given sequence 25.2(1987)162

Proposed by T.M. Richardson

To: x-Fibonomial coefficients and inverse Hankel matrices 39.3 (2001)275

Proposed by D.G. Rogers

1. To: Triangular arrays, partitions and sequences, MRFS(1980)172

Proposed by A. Rotkiewicz

1. To: Twin Fibonacci pseudoprimes, PI(1986)253
2. To: Arithmetic progressions of Fibonacci pseudoprimes, PI(1986)253
3. To: Triangular Fibonacci pseudoprimes, PI(1986)253
4. To: Pentagonal Fibonacci pseudoprimes, PI(1986)254
5. To: Fibonacci congruences with odd modulus, PI(1986)254
6. To: Geometric progressions with three Fibonacci pseudoprimes, PI(1986)254
9. To: Does a certain Lucas pseudoprime depending on prime numbers exist? PXII(329)

Proposed by Frank Ruskey

1. Are there quasi-periodic solutions to the Hofstadter recurrence other than 3? 48.3(2011)229
2. Are there quasi-periodic solutions to the Hofstadter recurrence other than 3 that yield Fibonacci numbers? 48.3(2011)229
3. Are there quasi-periodic solutions to other meta-Fibonacci recurrences? 48.3(2011)229
4. Does every rational sequence occur as the quasi-periodic solution to some meta-Fibonacci recurrence? 48.3(2011)229

Proposed by G.R. Sanchis & L.A. Sanchis

To: Frequency of occurrence in golden number expansions of integers 39.2 (2001)137

MISCELLANEOUS PROBLEM INDEX

Proposed by A.G. Schaake & J.C. Turner

1. To: Point-point relationships and sets of integers, PV(1993)583
2. To: Enteger polygons, PV(1993)583
3. To: Enteger trigonometry, PV(1993)583

Proposed by E. Schmeichel & K. Zikan

To: Digraphs and a recurrence relation 23.1(1985)6

Proposed by A.J. Schwenk

To: Strategies, sequences and generalizations of functions related to two person take-away games 8.3(1970)234

Proposed by J.A.Sellers, A.T. Benjamin & J. Crouch (See under Benjamin)

Proposed by J. Shallit

To: Is it possible to characterize the modified Engle expansion of every rational number? 31.1(1993)39

Proposed by J. Shallit & S. Haque (See under Haque)

Proposed by A.G. Shannon

To: Comutators, Horadam's sequence and Lie algebras 17.4(1979)349

To: Generalizing the Pellian equation 16.2(1978)102

Proposed by A.G. Shannon & R.L. Ollerton

To: Two element lattice permutations and paths through the lattice 40.5 (2002)422

Proposed by A.G. Shannon & C.K. Wong

To: Can all Pythagorean triples be expressed in terms of polynomials associated with 3rd order Pell numbers PXIII(345)

Proposed by L.W. Shapiro

[Note: $A(T)$ is an automorphism relating plane trees with n edges and binary plane trees with $n+1$ end points.]

1. To: Trees T , and composite automorphisms, $A^k(T)=T?$ 17.3(1979)257
2. To: Compositions of integers and the trees representing them 17.3(1979)257
3. To: Heights of trees, permutations and Fibonacci numbers 17.3(1979)258
4. To: Heights of trees, compositions, permutations, Lucas, Tribonacci & Pell numbers 17.3(1979)258

Proposed by L.R. Shenton

1. To: Formulating modified Fibonacci sequences of specified field lengths 6.2(1968)115
2. To: Finding periods for fields of length up to 10 for modified Fibonacci sequences 6.2(1968)116
3. To: Asymptotic value for the cycle length for modified Fibonacci sequences 6.2(1968)116
4. To: Density of occurrence of modified Fibonacci sequence members with a specified leading digit, 6.2(1968)116

Proposed by T. Shonhiwa

To: Finding inverse function pairs using binomial identities 37.3(1999)239

Proposed by K. Singh

1. To: Perfect Fibonacci numbers, MRFS(1980)168

MISCELLANEOUS PROBLEM INDEX

Proposed by W.D. Skees

[Note: $D(n)$ = the number of digits in n , and $q = q(n) = n/(n10^{D(n)}-1)$.]

1. To: (Theorem 6) The period of $q(n)$ 3.4(1965)289
2. To: (Theorem 7) Each digit of the period of q appears in succession as the terminal digit of a remainder when decimal division is carried out 3.4(1965)289
3. To: (Theorem 8) Cyclic permutations and the digits of the period of q 3.4(1965)289
4. To: (Theorem 9) Gauntlets and inequalities 3.4(1965)289
5. To: (Theorem 10) $D(g)$ divides the period of $q(g)$ 3.4(1965)289
6. To: Do there exist integers other than 1 and 34 for which $D(g) = g$? 3.4(1965)290

Proposed by Neil O. Smith

To: Find an alternate generalization for a Fibonacci summation identity 46/47.1(78)

Proposed by S.K. Stein

To: Generalization of a theorem on the density of integers having polynomial representation 11.5(1973)500

Proposed by I. Strazdins

To: Constructing Partial Pell, Lucas and Fibonacci sequences 37.3(1999)240

Proposed by M.N.S. Swamy

To: Finding the differential equation for rising diagonal generalized F/L polynomials 37.3(1999)222

To: Finding the differential equation for falling diagonal generalized Lucas polynomials 37.3(1999)222

Proposed by D.C. Terr

To: Researching generalizations of F-adic numbers 34.2(163)

To: Calculation of certain sums of digits of Fibonacci numbers 34.4(355)

Proposed by D. Thoro

- 1.1 To: Discovering Fibonacci number patterns 1.1(1963)51
- 1.2 To: Generalization of Fibonacci patterns 1.1(1963)51
- 1.3 To: Greatest common divisor 1.1(1963)51
- 1.4 To: Divisibility test for nine 1.1(1963)52
- 1.5 To: Test for primality of F_{19} 1.1(1963)51
- 1.6 To: Conditions for which numbers will or will not be located in a special rectangular array. 1.1(1963)52

[The answers to all these problems are in 1.1(1963)64]

- 1.1 To: Prime factor of n greater than the cube root of n 1.2(1963)59; Hint 1.2(1963)80
- 1.2 To: Two consecutive Fibonacci numbers are relatively prime 1.2(1963)59; Hint 1.2(1963)80
- 1.3 To: Twin primes 1.2(1963)59; Hint 1.2(1963)80
- 1.4 To: Divisors of Mersenne composites 1.2(1963)59; Hint 1.2(1963)80
- 1.5 To: There exist infinitely many primes 1.2(1963)60; Hint 1.2(1963)80
- E1. To: Golden section 1.3(1963)58
- E2. To: n th power reciprocal of golden section 1.3(1963)58
- E3. To: Negative subscripted Fibonacci numbers 1.3(1963)58
- E4. To: Geometric series 1.3(1963)58
- E5. To: Golden ratio approximations 1.3(1963)58
- E6. To: Error in golden ratio approximations 1.3(1963)58
- E7. To: Golden ratio approximations 1.3(1963)58
- E8. To: Two by two Q-like matrix 1.3(1963)58
- E9. To: Q-matrix variations 1.3(1963)59
- E10. To: Matrix recursion relation 1.3(1963)59

MISCELLANEOUS PROBLEM INDEX

Proposed by D. Thoro

- E.1 To: Euclidean algorithm 2.1(1964)55
- E.2 To: Euclidean algorithm 2.1(1964)56
- E.3 To: FORTRAN program for the length of the Euclidean algorithm 2.1(1964)56
- E.4 To: Length of the Euclidean algorithm 2.1(1964)56
- E.5 To: Probability and the length of the Euclidean algorithm 2.1(1964)56
- E.6 To: Length of the Euclidean algorithm 2.1(1964)56
- E.7 To: Bounds on the length of some Euclidean algorithms 2.1(1964)56
- E.8 To: GCD of consecutive Fibonacci numbers 2.1(1964)56
- E.9 To: Fibonacci numbers and lengths of the Euclidean algorithm 2.1(1964)56
- E.10 To: Fibonacci numbers and lengths of the Euclidean algorithm 2.1(1964)56
- 1. To: Continued fraction convergents for nonsquare integers 19.3(1981)275
- 2. To: Continued fraction convergents for nonsquare integers 19.3(1981)275
- 1. To: General term of a specific sequence, PII(1988)207
- 2. To: Congruence sequence, PII(1988)207
- 3. To: Base five sequence, PII(1988)207
- 4. To: Minimum number of multiplications needed to compute x^n , PII(1988)207
- 5. To: Largest power of 2 dividing $(2n)!$ PII(1988)207
- 6. To: Multiples of three and terminal digits, PII(1988)207
- 7. To: Three numbers representing sides of a triangle, PII(1988)208
- 8. To: Coefficients of factors of $x^n - 1$, PII(1988)208
- 9. To: Sequences from bichromatic graphs, PII(1988)208
- 10. To: Integral sequences from a square root, PII(1988)208
- 11. To: Integral sequences from a square root, PII(1988)208
- 12. To: General term of a specific sequence, PII(1988)208
- 13. To: Special partitions of n , PII(1988)208
- 14. To: Tiling a checkerboard, PII(1988)208
- 15. To: Odd Catalan numbers, PII(1988)209
- 16. To: Initial digits of powers of 2, PII(1988)209
- 17. To: Prime divisors of a quadratic polynomial, PII(1988)209
- 18. To: Nonprime divisors of the quadratic polynomial given in 17 (not 19 as printed)
PII(1988)209
- 19. To: Integer which is relatively prime to n consecutive positive integers, PII(1988)209
[Note that a remark about each of these problems appears on pages 209 and 210 in
PII(1988).]

Proposed by A. Tripathi

- 1. To: If $\sigma(n) = 2(n+k)$ for $k \geq 0$, the n must be even. 48.2(148)
- 2. To: Form for n if $\sigma(n) = 2(n+k)$ for $k \geq 0$. 48.2(148)

Proposed by S.J. Turner

- 1. To: Sequences of limits of Cauchy sequences of ratios of consecutive terms of second order Fibonacci-T numbers, 17.1(1979)28
- 2. To: Formula for the general term of the n^{th} order Fibonacci-T sequence where $n \geq 3$
17.1(1979)28
- 3. To: Generalized n^{th} order Fibonacci-T sequences 17.1(1979)28

Proposed by H.L. Umansky

To: Algorithm for the sum of the digits of the square of an integer in base q 11.3(1973)332

Proposed by S.G. Wagner

To: Determining the existence of the limit of a sequence related to the Fibonacci number of Peterson graphs 44.4(2006)367

MISCELLANEOUS PROBLEM INDEX

Proposed by W. Webb

- 4. To: Find a non-trivial identity involving recurrences or binomial coefficients where summation is over a set other than an arithmetic progression PXIII(377-8)

Proposed by C. Wenchang

To: derivation of some binomial convolution identities 40.1 (2002)31

Proposed by M. Wiemann & C. Cooper

- 1. To: Finding an explicit formula for the polynomial solutions of a certain non-homogeneous difference equation, PIX (287)
- 2. To: Divisibility property of a generalized Melham sum, PIX (287)
- 3. To: Analyze a certain Melham sum, PIX (287)

Proposed by C.F. Winans

To: Using the Fibonacci sequence to derive decimal equivalents of rational fractions MRFS(1980)81

Proposed by Y.(P.) Yang & J. Leida

- 1. To: Analyzing row generating functions for convolution matrices 42.3(2004)215
- 2. To: Finding column generating functions for a recursion relation matrix 42.3(2004)215

Proposed by P.T. Young

- 1.. To: Verify two identities involving weighte Stirlin numbers of the 1st kind by combinatorial means 52.5/PXVI(2014)208
- 2.. To: Verify an identity for poly-Bernoulli polynomials by counting techniques 52.5(2014)/PXV!(210)
