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Born in 1982.

Graduated from Tula State University (Faculty of Technology) and Tula State Pedagogical University (Faculty of Psychology).

I work in the field of metal processing industry.

I am interested in elementary and analytic number theory. In addition to mathematics I am fond of poetry. My books

OEIS sequences which I submitted

OEIS sequences which I submitted and/or edited

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Generalization of generating functions

The ordinary generating function for the alternating sum of k-gonal numbers

$$\frac{-x(1-(k-3)x)}{(1-x)(1+x)^3}$$

A266088

The ordinary generating function for the alternating sum of centered k-gonal numbers

$$\frac{1-(k-2)x+x^2}{(1-x)(1+x)^3}$$

A270693

The ordinary generating function for the alternating sum of k-gonal pyramidal numbers

$$\frac{-x(1-(k-3)x)}{(1-x)(1+x)^4}$$

A266677

The ordinary generating function for the alternating sum of centered k-gonal pyramidal numbers

$$\frac{-x(1-(k-2)x+x^2)}{(1-x)(1+x)^4}$$

A270694

The ordinary generating function for the first bisection of k-gonal numbers

$$\frac{kx+(3k-8)x^2}{(1-x)^3}$$

A270704

The ordinary generating function for the first trisection of k-gonal numbers

$$\frac{3x(k-1+(2k-5)x)}{(1-x)^3}$$

A268351

The ordinary generating function for the squares of k-gonal numbers

$$\frac{x(1+(k^2-5)x+(4k^2-18k+19)x^2+(k-3)^2x^3)}{(1-x)^5}$$

A100255

The ordinary generating function for the convolution of nonzero k-gonal numbers and nonzero h-gonal numbers

$$\frac{(1+(k-3)x)(1+(h-3)x)}{(1-x)^6}$$

A271663

The ordinary generating function for the convolution of nonzero k-gonal numbers with themselves

$$\frac{(1+(k-3)x)^2}{(1-x)^6}$$

A271662

The ordinary generating function for the convolution of nonzero k-gonal numbers and nonzero triangular numbers

$$\frac{1+(k-3)x}{(1-x)^6}$$

A271567

The ordinary generating function for the generalized k-gonal numbers

$$\frac{x(1+(k-4)x+x^2)}{(1-x)^3(1+x)^2}$$

A277082

The ordinary generating function for the Sum_{k = 0..n} m^k

$$\frac{1}{(1-mx)(1-x)}$$

A269025

The ordinary generating function for the Sum_{k = 0..n} (-1)^k*m^k

$$\frac{1}{1+(m-1)x-mx^2}$$

A268413

The ordinary generating function for the Sum_{k=0..n} floor(k/m)

$$\frac{x^m}{(1-x^m)(1-x)^2}$$

A269445

The ordinary generating function for the sums of m consecutive squares of nonnegative integers

$$\frac{m(1-2x+13x^2+2m^2(1-2x+x^2)-3m(1-4x+3x^2))}{6(1-x)^3}$$

A276026

The ordinary generating function for the number of ways of writing n as a sum of k squares

$$\vartheta_3(0,q)^k = 1+2kq+2(k-1)q^2+\frac{4}{3}(k-2)(k-1)kq^3+...$$

A276285

The ordinary generating function for the values of quadratic polynomial p*n^2 + q*n + k

$$\frac{k+(p+q-2k)x+(p-q+k)x^2}{(1-x)^3}$$

A270710

The ordinary generating function for the values of cubic polynomial p*n^3 + q*n^2 + k*n + m

$$\frac{m+(p+q+k-3m)x+(4p-2k+3m)x^2+(p-q+k-m)x^3}{(1-x)^4}$$

A268644

The ordinary generating function for the values of quartic polynomial p*n^4 + q*n^3 + k*n^2 + m*n + r

$$\frac{(r+(p+q+k+m-4r)x+(11p+3q-k-3m+6r)x^2+(11p-3q-k+3m-4r)x^3+(p-q+k-m+r)x}{(1-x)^5}$$

A269792

The ordinary generating function for the values of quintic polynomial b*n^5 + p*n^4 + q*n^3 + k*n^2 + m*n + r

$$\frac{r+(b+p+q+k+m-5r)x+(13b+5p+q-k-2m+5r)2x^2+(33b-3q+3m-5r)2x^3+(26b-10p+2q}{(1-x)^6}$$

A125083

The ordinary generating function for the characteristic function of the multiples of k

$$\frac{1}{1-x^k}$$

A267142

The ordinary generating function for the continued fraction expansion of phi^(2*k + 1), where phi = (1 + sqrt(5))/2), k = 1, 2, 3,...

$$\frac{\lfloor \varphi^{2k+1} \rfloor}{1-x}$$

A267319

The ordinary generating function for the continued fraction expansion of phi^(2*k), where phi = (1 + sqrt(5))/2), k = 1, 2, 3,...

$$\frac{\lfloor \varphi^{2k} \rfloor + x - x^2}{1-x^2}$$

A267319

The ordinary generating function for the continued fraction expansion of exp(1/k), with k = 1, 2, 3....

$$\frac{1+(k-1)x+x^2-(k+1)x^3+7x^4-x^5}{(1-x^3)^2}$$

A267318

The ordinary generating function for the Fibonacci(k*n)

$$\frac{\left(\varphi^k-\left(-\frac{1}{\varphi}\right)^k\right)x}{\sqrt{5}\left(1-\left(\varphi^k+\left(-\frac{1}{\varphi}\right)^k\right)x+(-1)^k x^2\right)}$$

A269500

The ordinary generating function for the Sum_{k = 0..n} (k mod m)

$$\frac{\sum_{k=1}^{m-1} kx^k}{(1-x^m)(1-x)}$$

A268291

The ordinary generating function for the recurrence relation b(n) = k^n - b(n-1), with n>0 and b(0)=0

$$\frac{kx}{(1+x)(1-kx)}$$

A271427

The ordinary generating function for the recurrence relation b(n) = k*b(n - 1) - m*n, with n>0 and b(0)=1

$$\frac{1-(m+2)x+x^2}{(1-x)^2(1-kx)}$$

A268414

The ordinary generating function for the recurrence relation b(n) = r*b(n - 1) + s*b(n - 2), with n>1 and b(0)=k, b(1)=m

$$\frac{k-(kr-m)x}{1-rx-sx^2}$$

A268409

The ordinary generating function for the recurrence relation b(n) = k*b(n - 1) - m*b(n - 2), with n>1 and b(0)=0, b(1)=1

$$\frac{x}{1-kx+mx^2}$$

A268344

The ordinary generating function for the recurrence relation b(n) = k*b(n - 1) - b(n - 2), with n>1 and b(0)=1, b(1)=1

$$\frac{1-(k-1)x}{1-kx+x^2}$$

A269028

The ordinary generating function for the recurrence relation b(n) = 2*b(n - 2) - b(n - 1), with n>1 and b(0)=k, b(1)=m

$$\frac{k+(k+m)x}{1+x-2x^2}$$

A268741

The ordinary generating function for the recurrence relation b(n) = b(n - 1) + 2*b(n - 2) + 3*b(n - 3) + 4*b(n - 4) + ... + k*b(n - k), with n > k - 1 and initial values b(i-1) = i for i = 1..k

$$\frac{\sum_{m=0}^{k-1} \frac{(-m^3-3m^2+4m+6)x^m}{6}}{1-\sum_{m=1}^{k} mx^m}$$

A268349

The ordinary generating function for the recurrence relation b(n) = b(n - 1) + b(n - 2) + b(n - 3), with n>2 and b(0)=k, b(1)=m, b(2)=q

$$\frac{k+(m-k)x+(q-m-k)x^2}{1-x-x^2-x^3}$$

A268410

The ordinary generating function for the recurrence relation b(n) = floor(phi^(2*k)*b(n - 1)), with n>0, b(0)=1 and k = 0,1,2,3, ...

$$\frac{1-x}{1-\left(\varphi^{2k}+(-\varphi)^{-2k}\right)x+x^2}$$

A278475

The ordinary generating function for the recurrence relation b(n) = floor(phi^(2*k+1)*b(n - 1)), with n>0, b(0)=1 and k = 0,1,2,3, ...

$$\frac{1-x-x^2}{(1-x)(1-\left(\varphi^{2k+1}+(-\varphi)^{-2k-1}\right)x-x^2)}$$

A278475

The ordinary generating function for the recurrence relation b(n) = floor((1 + sqrt(2))^(2*k)*b(n - 1)), with n>0, b(0)=1 and k = 1,2,3,4, ...

$$\frac{1-x}{1-\left[(1+\sqrt{2})^{2k}\right]x+x^2}$$

A278476

The ordinary generating function for the recurrence relation b(n) = floor((1 + sqrt(2))^(2*k+1)*b(n - 1)), with n>0, b(0)=1 and k = 0,1,2,3, ...

$$\frac{1-x-x^2}{(1-x)(1-\left\lceil(1+\sqrt{2})^{2k+1}\right\rceil x-x^2)}$$

A278476

The ordinary generating function for the integers repeated k times

$$\frac{x^k}{(1-x)(1-x^k)}$$

A004526

The ordinary generating function for the partial sums of numbers that are repdigits in base k (for k > 1)

$$\frac{\sum_{m=1}^{k-1} m x^m}{(1-x)(1-x^{k-1})(1-kx^{k-1})}$$

A277209

The ordinary generating function for the binomial coefficients C(n,k)

$$\frac{x^k}{(1-x)^{(k+1)}}$$

A017764

The ordinary generation function for the Gaussian binomial coefficients [n,k]_q

$$\frac{x^k}{\prod_{m=0}^{k}(1-q^m x)}$$

A275944

The ordinary generating function for the transformation of the Wonderful Demlo numbers

$$\frac{kx(1+10x)}{1-111x+1110x^2-1000x^3}$$

A271528

The ordinary generating function for the sequences of the form k^n + m

$$\frac{1+m-(1+km)x}{(1-x)(1-kx)}$$

A271527

The ordinary generating function for the sequences of the form k*(n + 1)*(n - 1 + k)/2

$$\frac{\frac{k(k-1)}{2}+\left(\frac{k(3-k)}{2}\right)x}{(1-x)^3}$$

A269457

The ordinary generating function for the number of partitions of n into parts congruent to 1 mod m (for m>0)

$$\prod_{k=0}^{\infty}\frac{1}{1-x^{mk+1}}$$

A277090

The ordinary generating function for the number of partitions of n into parts larger than 1 and congruent to 1 mod m (for m>0)

$$\prod_{k=1}^{\infty}\frac{1}{1-x^{mk+1}}$$

A277210

The ordinary generating function for the surface area of the n-dimensional sphere of radius r

$$2x\left(1+\pi\exp(\pi r^2x^2)rx+2\sqrt{\pi}\exp(\pi r^2x^2)rx\int_0^{\sqrt{\pi}rx}\exp(-t^2)dt\right)$$

A072478

The sum of reciprocals of Catalan numbers (with even indices, with odd indices)

$$\sum_{k=0}^{\infty}\frac{2k+1}{\binom{4k}{2k}}=\frac{2\pi}{9\sqrt{3}}-\frac{4(3\sqrt{5}\ln\varphi-40)}{125}$$

A276483

$$\sum_{k=0}^{\infty}\frac{2k+2}{\binom{4k+2}{2k+1}}=\frac{2\pi}{9\sqrt{3}}+\frac{6(2\sqrt{5}\ln\varphi+15)}{125}$$

A276484

Double hyperfactorial

$$H_2(n) = \begin{cases} n^n \cdot (n-2)^{n-2} \cdot \ldots \cdot 5^5 \cdot 3^3 \cdot 1^1, n > 0, n \Rightarrow odd \\ n^n \cdot (n-2)^{n-2} \cdot \ldots \cdot 6^6 \cdot 4^4 \cdot 2^2, n > 0, n \Rightarrow even \\ 0, n = 0 \end{cases}$$

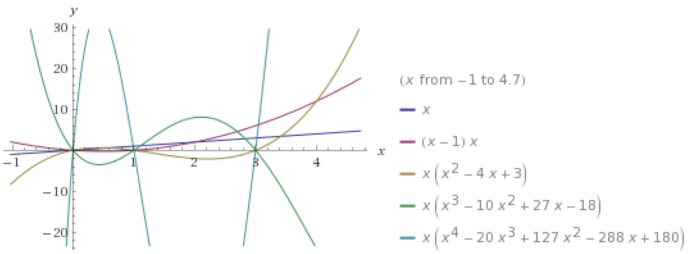
$$H_2(n) = \prod_{k=0}^{\lfloor \frac{(n-1)}{2} \rfloor} (n-2k)^{n-2k}$$

$$H_2(n) = \frac{1}{H_2(n-1)} \sqrt{\frac{H_2(2n)}{2^{n(n+1)})}}$$

A271385

Polynomials

Polynomials T_n(x) = -((-1)^n*2^(-n-1)*cos(Pi*sqrt(8*x+1)/2)*Gamma(n-sqrt(8*x+1)/2+3/2)*Gamma(n+sqrt(8*x+1)/2+3/2))/Pi

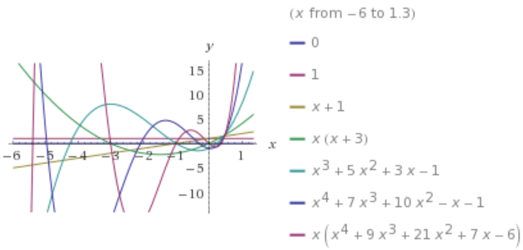


$$T_n(x) = \prod_{k=0}^{n} \left(x - \sum_{m=0}^{k} m \right)$$

$$T_n(x) = 0 \Rightarrow x = 0 + 1 + 2 + 3 + \ldots = \frac{k(k+1)}{2}, k \leqslant n$$

A271386

Polynomials Q_n(x) = 2^(-n)*((x+sqrt(x*(x+6)-3)+1)^n-(x-sqrt(x*(x+6)-3)+1)^n)/sqrt(x*(x+6)-3)

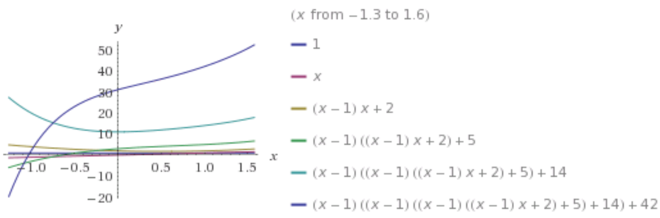


$$G(x,t) = \frac{t}{1-(x+1)t-(x-1)t^2} = t + (x+1)t^2 + x(x+3)t^3 + ..$$

$$Q_n(x) = (x+1)Q_{n-1}(x) + (x-1)Q_{n-2}(x) \Rightarrow Q_0(x) = 0, Q_1(x) = 1$$

A271451

Polynomials C_n(x) = Sum_(k=0..n} (2*k)!*(x - 1)^(n-k)/((k + 1)!*k!)



$$G(x,t) = \frac{1-\sqrt{1-4t}}{2t(1+t-xt)} = 1 + xt + (x^2 - x + 2)t^2 + (x^3 - 2x^2 + 3x + 3)t^3 + \ldots$$

$$C_n(x) = (x-1)C_{n-1} + C_n(1) \Rightarrow C_0(x) = 1$$

$$C_n(1) = \frac{(2n)!}{(n+1)!n!}$$

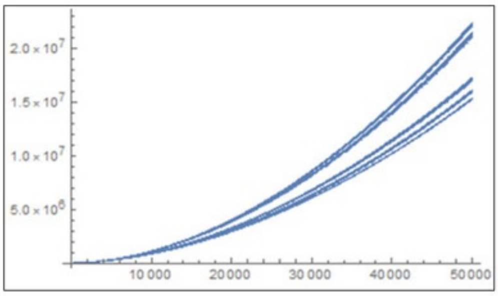
$$C_n(2) = \sum_{m=0}^{n} C_m(1)$$

A271453

Conjectures

Every number > 15 can be represented as a sum of 3 semiprimes.

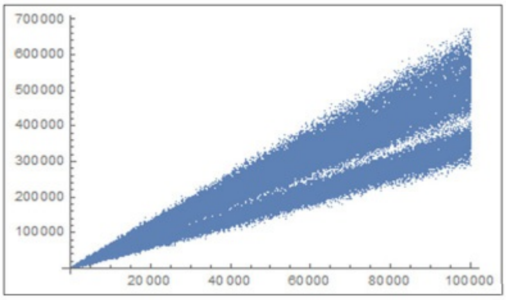
A282135



Every number is the sum of at most 6 square pyramidal numbers.

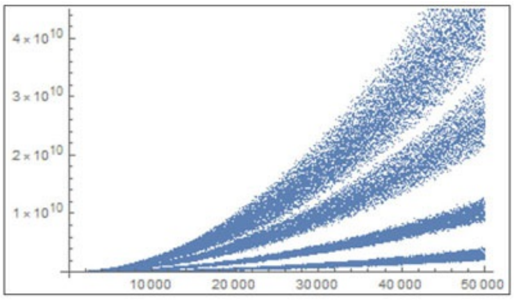
Every number is the sum of at most k+2 k-gonal pyramidal numbers (except k = 5).

A282173



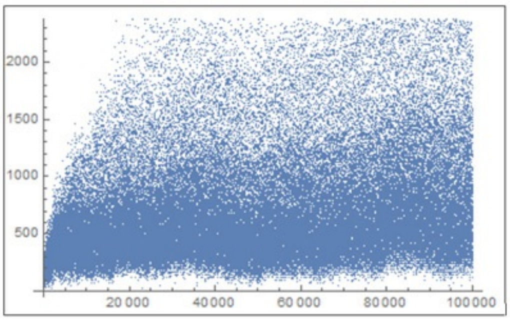
Every number is the sum of at most 12 squares of triangular numbers (or partial sums of cubes).

A284641



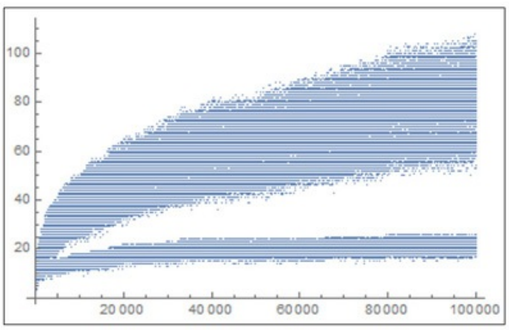
Every number > 27 can be represented as a sum of 4 proper prime powers.

A282289



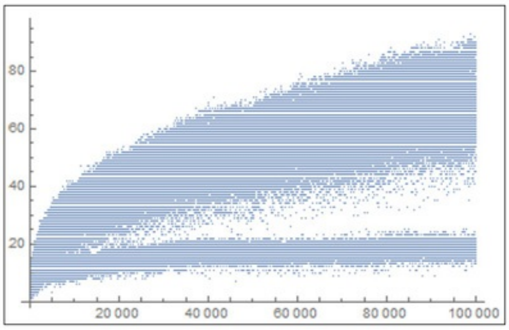
Every number > 8 can be represented as a sum of a proper prime power and a squarefree number > 1.

A282290



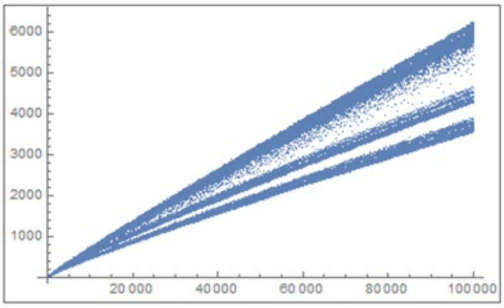
Every number > 108 can be represented as a sum of a proper prime power and a nonprime squarefree number.

A287299



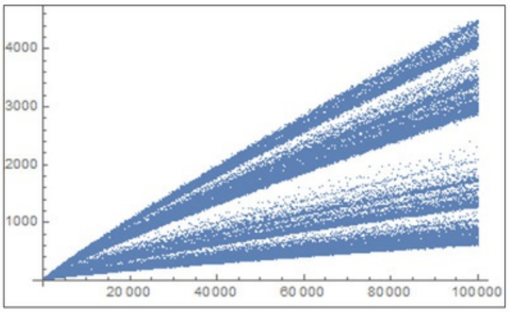
Every number > 10 can be represented as a sum of a prime and a nonprime squarefree number.

A282318



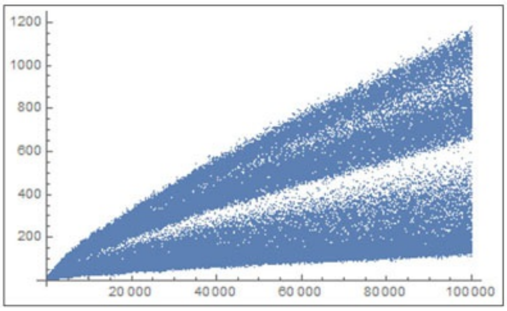
Every number > 30 can be represented as a sum of a prime and a squarefree semiprime.

A282192



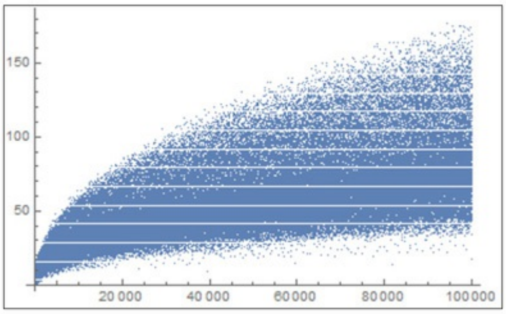
Every number > 30 can be represented as a sum of a twin prime and a squarefree semiprime.

A283929



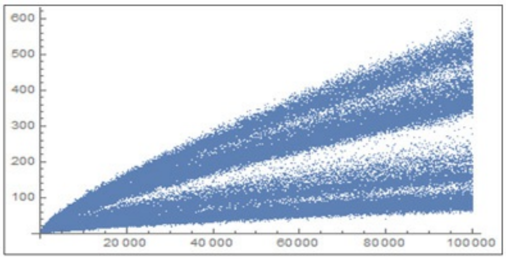
Every number > 108 can be represented as a sum of a perfect power and a squarefree semiprime.

A282947



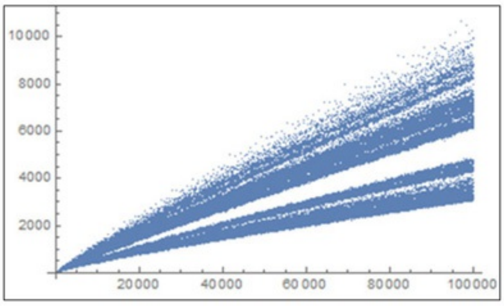
Every number > 527 can be represented as a sum of a prime with prime subscript and a semiprime (only 18 positive integers cannot be represented as a sum of a prime with prime subscript and a semiprime).

A282355



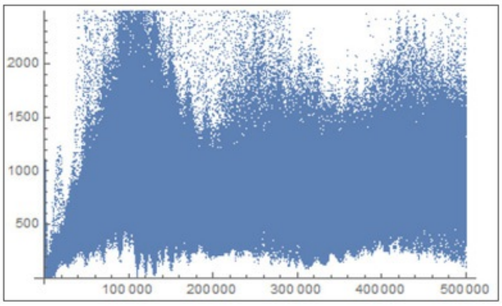
Every number > 51 can be represented as a sum of 2 multiplicatively perfect numbers.

A282570

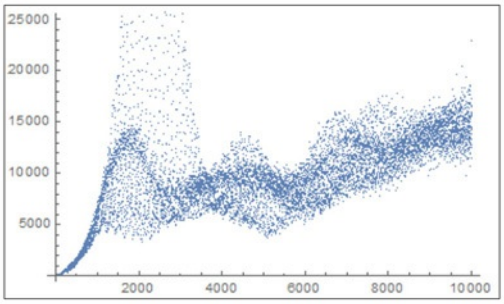


Any sufficiently large number can be represented as a sum of 3 squarefree palindromes.

A282585



Every number > 3 can be represented as a sum of 4 squarefree palindromes.



Every number > 82 can be represented as a sum of 2 numbers that are the product of an even number of distinct primes (including 1).

A285796

Every number > 57 can be represented as a sum of 2 numbers that are the product of an odd number of distinct primes.

A285797

Every number > 10 can be represented as a sum of 2 numbers, one of which is the product of an even number of distinct primes (including 1) and another is the product of an odd number of distinct primes.

A286971

Every number > 1 is the sum of at most 5 centered triangular numbers.

A282502

Every number > 1 is the sum of at most 6 centered square numbers.

Every number > 1 is the sum of at most k+2 centered k-gonal numbers.

A282504

Every number is the sum of at most 15 icosahedral numbers.

A282350

Every number > 23 is the sum of at most 8 squares of primes.

Every number > 131 can be represented as a sum of 13 squares of primes.

A275001

Every number > 16 is the sum of at most 4 primes of form x^2 + y^2.

A282971

Every number > 7 is the sum of at most 4 twin primes.

A283875

Every number > 3 is the sum of at most 5 partial sums of primes.

A282906

Let a_p(n) be the length of the period of the sequence k^p mod n where p is a prime, then a_p(n) = n/p if n == 0 (mod p^2) else a_p(n) = n.

A282779

Let a(n) be the sum of largest prime power factors of numbers <= n, then a(n) = O(n^2/log(n)).

A284521

Let a(n) = Sum_{k=1..n} sigma(k)/k, where sigma(k) is the sum of the divisors of k, it is assumed that the value of a(n)/n approaches Pi^2/6.

A284648

Let a(n) = n - a(floor(a(n-1)/2)) with a(0) = 0, then a(n) ~ c*n, where c = sqrt(3) - 1.

A286389

$$G.f. \ = \frac{\sum_{k=0}^{\infty} \lfloor \varphi^2(k+1) \rfloor x^k}{\sum_{k=0}^{\infty} \lfloor \varphi(k+1) \rfloor x^k} = 1 + \cfrac{1}{1 + \cfrac{x}{1+\cfrac{x}{1+\cfrac{x^2}{1+\dots \cfrac{x^{\left\lfloor \frac{\varphi^k}{\sqrt{5}} \right\rceil}}{1+\dots}}}}}$$

$$\varphi = \frac{1+\sqrt{5}}{2}$$

A279586

Recurrences (Pisot and related sequences)

a(n) = floor(a(n-1)^2/a(n-2)), a(0) = 3, a(1) = 16.

$$a(n) = [x^n] \, \frac{3 - 2x + x^2 - x^3}{1 - 6x + 4x^2 - 2x^3 + 2x^4}$$

A278681

a(n) = floor(a(n-1)^2/a(n-2)), a(0) = 4, a(1) = 14.

$$a(n) = [x^n] \, \frac{4 - 2x + x^2 - x^3}{1 - 4x + 2x^2 - x^3 + x^4}$$

A278692

a(n) = floor(a(n-1)^2/a(n-2)), a(0) = 5, a(1) = 13.

$$a(n) = [x^n] \, \frac{5 - 2x + 4x^2 - 5x^3 + x^4 - 2x^5}{(1-x)(1 - 2x - 3x^3 - x^5)}$$

A278764

a(n) = ceiling(a(n-1)^2/a(n-2)), a(0) = 4, a(1) = 14.

$$a(n) = [x^n] \, \frac{4 + 2x - x^2 - 3x^3 - 2x^4 - 2x^5 + 2x^6 - x^7}{(1-x)(1 - 2x - 4x^2 - 4x^3 - 2x^4 - x^5 + x^6 - x^7)}$$

A277084

a(n) = ceiling(a(n-1)^2/a(n-2)), a(0) = 5, a(1) = 12.

$$a(n) = [x^n] \, \frac{5 - 3x + 3x^2 - 2x^3 + x^5 - 3x^6 - x^7 - 2x^8}{(1-x)(1 - 2x - 2x^3 - x^4 - x^5 - 2x^6 - x^7 - x^8)}$$

A277088

a(n) = ceiling(a(n-1)^2/a(n-2)), a(0) = 6, a(1) = 15.

$$a(n) = [x^n] \, \frac{6 - 3x - x^2 - 2x^3 + x^4 + 3x^5 - 5x^6}{(1-x)(1 - 2x - x^2 - x^3 - 2x^6)}$$

A277089

- Exponential generating functions of some integer sequences
- Sums of reciprocals