Michael Debellevue and Ekaterina Kryuchkova
Fractal Behavior of the Fibonomial Triangle Modulo Prime p, Where the Rank of Apparition of p is $p+1$,
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Abstract

Pascal's triangle is known to exhibit fractal behavior modulo prime numbers. We tackle the analogous notion in the Fibonomial triangle modulo prime p with the rank of apparition $p^* = p+1$, proving that these objects form a structure similar to the Sierpinski Gasket. Within a large triangle of p^*p^{m+1} many rows, in the i^{th} triangle from the top and the j^{th} triangle from the left, $\binom{n+ip^*p^m}{k+jp^*p^m}_F$ is divisible by p if and only if $\binom{n}{k}_F$ is divisible by p. This proves the existence of the recurring triangles of zeroes that are the principal component of the Sierpinski Gasket. The exact congruence classes follow the relationship $\binom{n+ip^*p^m}{k+jp^*p^m}_F \equiv_p (-1)^{ik-nj}\binom{i}{j}\binom{n}{k}_F$, where $0 \le n, k < p^*p^m$.