Pascals Triangle

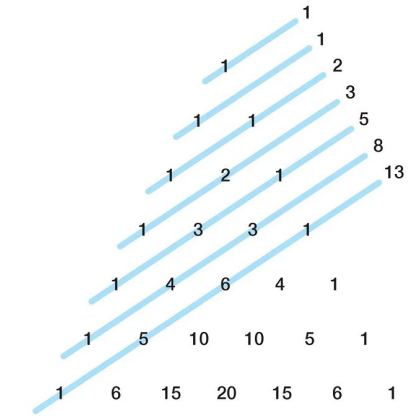
Hidden secrets that lurk beneath the surface…

Pascals triangle

The triangle has many hidden secrets relating to other mathematical discoveries such as teh fibonacci sequence, or sierpinski’s triangle

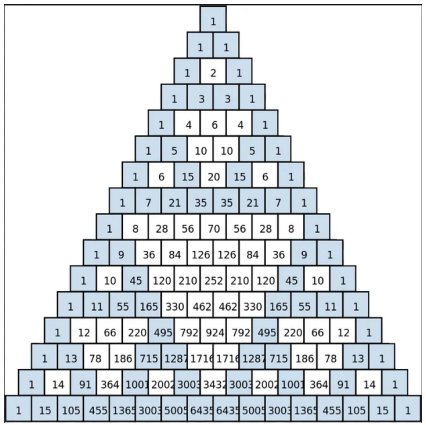
Pascal's Triangle + Fibonacci sequence?

Pascals triangle actually directly corresponds with the fibonacci sequence, infact they even used the fibonacci sequence to find more numbers in pascals triangle before they figured out how to add the numbers to differ from the fibonacci sequence, its actually really cool



Pascals Triangle + sierpinski’s Triangle

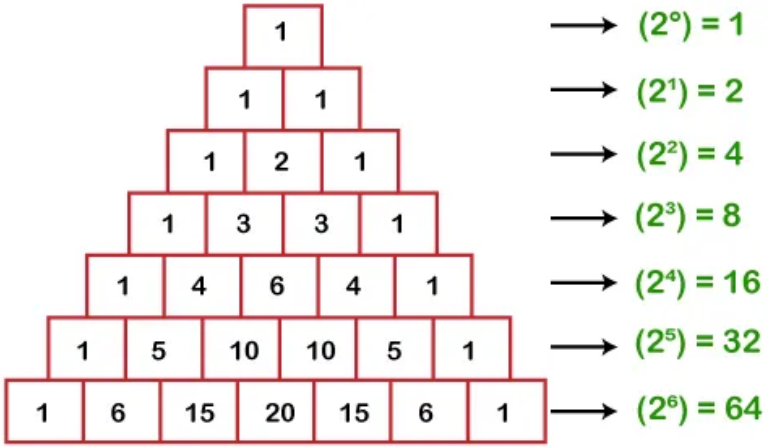
Pascals triangle also correlates to sierpinski's triangle, if you shade every single odd number and leave all the even ones blank, then you will see you get a close representation with sierpinski’s triangle in making all the unshaded squares francals shown exactly like sierpinski's triangle



Rows and powers?

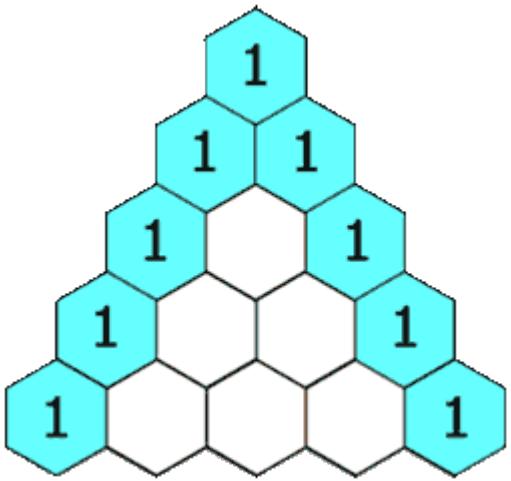
Did you know that if you add up each row starting with the frist one (row 0) that its all powers of 2.

As shown in the image if you add say, 1+6+15+20+15+6+1 your answer will be 64 which is 2^6 or the 6th row



How does one make up a pascals triangle

Pascals triangle can be made by getting the number, starting with 1 and adding the two numbers above ot, 1+1 = 1 so the first 2 rows are 1 then followed by 1, 1 but but then following the sequence on the second row (they start at row 0) then you get 1,2,1 then 1,3,3,1 and it follows down infinitely, have some fun reviewing these, see how far into pascals triangle you can get in 10 minutes, (no calculator or google allowed)



The beginning…

The pattern of numbers that forms pascals triangle was known well before pascals time. The persian mathematician Ai-Karaji (born 953, died 1029) who wrote a now lost book which contained the first formulation of the binomial coefficients and the first description of pascals triangle. It was later repeated by Omar Khayyam (life span 1048 - 1131), another persian mathematician, thus the triangle is also referred to as khayyams triangle. Several theorems related to the triangle were known, including the binomial theorem. Khayyam used a method of finding nth roots based on the binomial expansion, and therefore on the binomial coefficients.

Pascals triangle was known in china during the early 11th century through the work of the chinese mathematician jia xian (lived 1010-1070). During the 13th century, yang hui (lived 1238-1298) defined the triangle, and it is known as yang hui's triangle in china.

In europe, pascals triangle appeared for the first time in the arithmetic of jordanus de nemore (13th century) the binomial coefficients were calculated by gersonides during the early 14th century, using he multiplicative formula for them. Petrus apianus (lived 1495-1552) published the full triangle on the frontispiece of his boon on business calculations in 1527. Michael stifel published a portion of the triangle (from the second to the middle column in each row) in 1544, describing it as a table of figurate numbers. In italy, pascals triangle is referred to as tartaglias triangle, names for the italian algebraist niccolo fontana targalia (lived 1500-1577). Who published six rows of the triangle in 1556. Gerolamo cardano also published the triangle as well as the addictive and multiplacative rules for constructing it in 1570.

Bilblioografy (spelled wrong intentionally)

https://en.wikipedia.org/wiki/Pascal%27s_triangle

https://www.cantorsparadise.com/8-secrets-of-pascals-triangle-349cb5e46b09