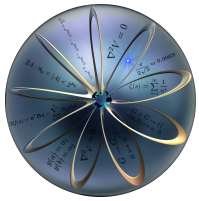

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Losanitsch's triangle

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A triangular arrangement of numbers very similar to Pascal's triangle.

Begin as you would if you were constructing Pascal's triangle, with a 1 in the top row, and that row k numbered 0, and the 1's position n as 0.

$$\begin{array}{ccccccc} & & & 1 & & & \\ & & 1 & & 1 & & \\ & 1 & & x & & 1 & \\ \vdots & & & \vdots & & & \vdots \end{array}$$

Now, for the next value, add up the two values above, but then subtract

$$\binom{\frac{n}{2}-1}{\frac{k-1}{2}}$$

From this forward, do the same for every even-numbered position in an even-numbered row. Instead of calculating the binomial coefficient, it can be looked up in Pascal's triangle.

$$\begin{array}{ccccccccccccc} & & & & & 1 & & & & & & & \\ & & & & 1 & & 1 & & & & & & \\ & & & 1 & & 1 & & 1 & & & & & \\ & & 1 & & 2 & & 2 & & 1 & & & & \\ & 1 & & 2 & & 4 & & 2 & & 1 & & & \\ 1 & & 3 & & 6 & & 6 & & 3 & & 1 & & \\ & 3 & & 9 & & 10 & & 9 & & 3 & & 1 & \\ 1 & & 4 & & 12 & & 19 & & 19 & & 12 & & 4 & & 1 \\ & & \vdots & & & & \vdots & & & & \vdots & & & & \end{array}$$

This triangle was first studied by the Serbian chemist Sima Losanitsch, but has since been found to have applications in graph theory and combinatorics.

References

[1] S. M. Losanitsch, *Die Isomerie-Arten bei den Homologen der Paraffin-Reihe*, Chem. Ber. 30 (1897), 1917-1926.