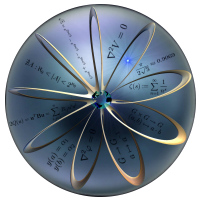

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Pascal matrix

Canonical name	PascalMatrix
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Definition The *Pascal matrix* P of order n is the real square $n \times n$ matrix whose entries are [**?**]

$$P_{ij} = \binom{i+j-2}{j-1}.$$

For $n = 5$,

$$P = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 1 & 2 & 3 & 4 & 5 \\ 1 & 3 & 6 & 10 & 15 \\ 1 & 4 & 10 & 20 & 35 \\ 1 & 5 & 15 & 35 & 70 \end{pmatrix},$$

so we see that the Pascal matrix contains the Pascal triangle on its antidiagonals.

Pascal matrices are ill-conditioned. However, the inverse of the $n \times n$ Pascal matrix is known explicitly and given in [**?**]. The characteristic polynomial of a Pascal triangle is a reciprocal polynomial [**?**].

References

[1] N.J. Higham, *Accuracy and Stability of Numerical Algorithms*, 2nd ed., SIAM, 2002.