Tableau 2, Part 2

Combinatorial Elements: Basic Properties of Binomial Coefficients

Alternative forms for the falling factorial

$n^{\underline{k}}$

Alternative forms for the falling factorial

$$n^{\underline{k}} = n \times (n-1) \times \cdots \times \big(n-(k-1)\big)$$

Alternative forms for the falling factorial

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n^{\underline{k}} &= n \times (n-1) \times \cdots \times \big(n-(k-1)\big) \\
&= n \times (n-1) \times \cdots \times \big(n-(k-1)\big) \cdot \frac{(n-k) \times \cdots \times 2 \times 1}{(n-k) \times \cdots \times 2 \times 1}
\end{aligned}
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Express $n^{\underline{n-k}}$ in terms of factorials:

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Express $n^{\underline{n-k}}$ in terms of factorials:

$$n^{\underline{n-k}} = \frac{n!}{\big(n-(n-k)\big)!} = \frac{n!}{k!}$$