

MTHSC 3190 SECTION 2.8

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EXAMPLE

The number of length n lists with elements chosen from $1, 2, \dots, n$ is

$$(n)_n = n \cdot (n-1) \cdot (n-1) \cdots 2 \cdot 1.$$

DEFINITION

If $n \geq 1$, then we define $n! = n \cdot (n-1) \cdot (n-1) \cdots 2 \cdot 1$.
We also define $0! = 1$.

EXAMPLE

Compute $3!$, $4!$ and $5!$.

DEFINITION

$$\prod_{i=1}^n a_i = a_1 \cdot a_2 \cdot \cdots \cdot a_n.$$

EXAMPLE

Compute

① $\prod_{k=1}^3 k =$

② $\prod_{k=1}^3 3 =$

③ $\prod_{k=1}^3 (2k + 1) =$

④ $\prod_{k=1}^n k =$

EXAMPLE

Compute $\frac{103!}{100!} =$