

Discrete Structures
Combinatorics

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Contents

1	Factorials	2
2	The fundamental counting principal (Basic counting principal)	3

1 Factorials

Definition 1:

The **Factorial** for a positive integer n , is the product of all the positive integers that are less than or equal to n

$$n! = n \cdot (n - 1) \cdots 3 \cdot 2 \cdot 1.$$

2 The fundamental counting principal (Basic counting principal)

• Definition 2: •

The **fundamental counting principal** says that if there are a ways of doing event 1, b ways of doing event 2, and c ways of doing event 3, then the total number of outcomes are (when no do events are dependent on each other)...

$$a \cdot b \cdot c.$$

Note: If there is dependency between the events, we must use addition