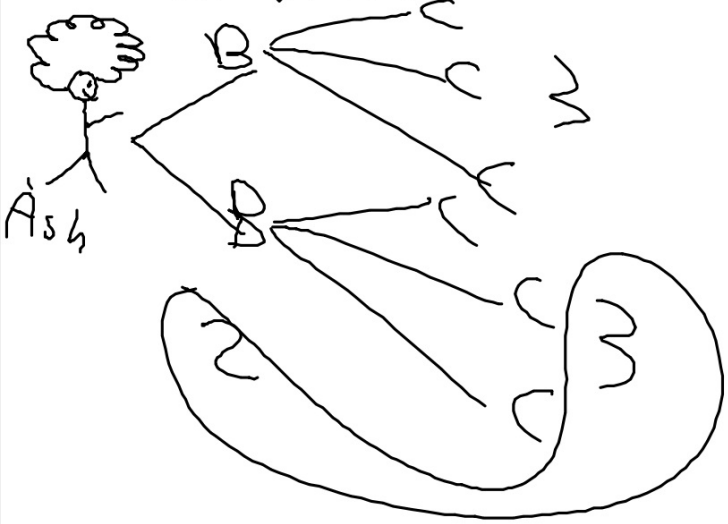
The Counting Principle

Ex. Suppose that 3 towns, Ashbury, Brampton, and Carmichael, are located in such a way that 2 roads connect Ashbury to Brampton and 3 roads connect Brampton to Carmichael. How many different routes can one take to travel from Ashbury to Carmichael via Brampton?



Fundamental Counting Principle – Suppose that 2 events occur in order. If the first can occur "m" ways and the second in "n" ways (after the 1st has occured), then two events can occur in order $m \times n$ ways. types

ex. An ice-cream store offers 3 diff/ of cones, and 31 flavors. How many different types of order can you make

$$\underline{3} \times \underline{31} = 93$$

ex 2. In a certain State, automobile license plates display 3 letters followed by 3 numbers. How many such plates are possible if . . .

a) repetition is allowed?

10 - MAMA

$26 \cdot 26 \cdot 26 \cdot 10 \cdot 10 \cdot 10$ 2016

$= 26^3 \, 10^3 = 17,576,000$

b) repetition is not allowed

$26 \cdot 25 \cdot 24 \cdot 10 \cdot 9 \cdot 8$

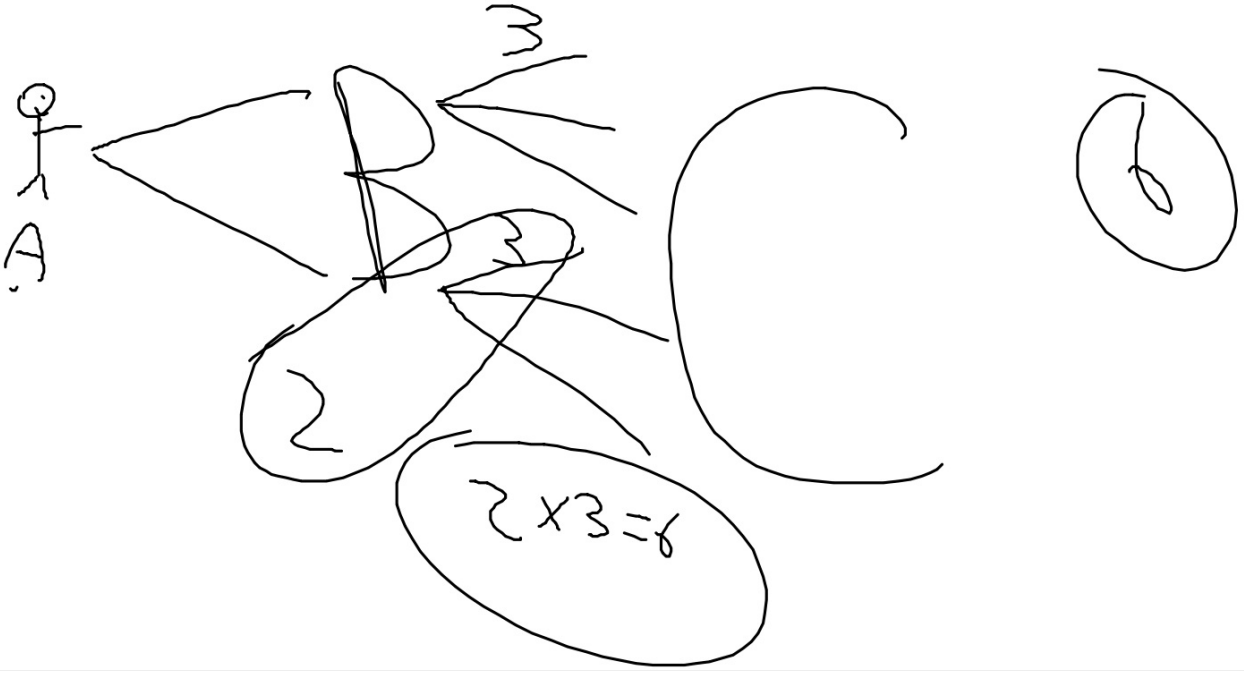
$= 11,232,000$

1, 2, 5, 7, 9, 11, 12, 14, 16, 18, 21, 30, 41.

A lot easier than you think.

Counting Principle

ex. Suppose that three towns A, B, and C, are located in such a way that there are two different routes from A to B, and three different routes from B to C. How many different routes can one take to go from A to C, via B?



Fundamental Counting Principle – Suppose that two events occur in order. If the first can occur in "m" ways and the second in "n" ways (after the first has occured), then the two events can occur in order $m \times n$ ways.

ex. 1 An ice-cream store offers 3 diff. types of cones, and 31 flavors. How many diff. orders can be made?

$3 \times 31 = 93$

In a certain State, automobile license plates display 3 letters followed by 3 numbers. How many such plates are possible if repetition is...

a) allowed ?

MAY Certain 2016

$26\ 26\ 26\ 10\ 10\ 10$

$= 26^3 10^3 = 17,576,000$

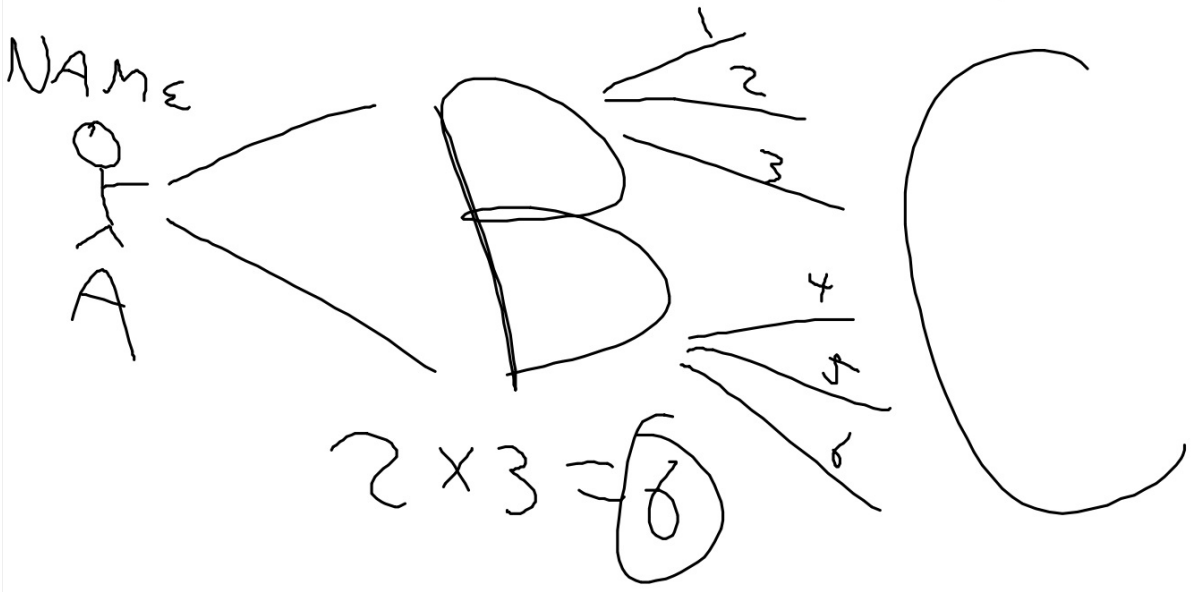
b) not allowed ?

$26\ 25\ 24\ 10\ 9\ 8$

$= 11,232,000$

Counting Principle

Ex. Suppose that 3 towns, A, B, and C, are located such that there are two routes from A to B, and 3 routes from B to C. How many different routes are possible to travel from A to C, via B?



Fundamental Counting Principle — Suppose that 2 events occur in order. If the first can occur in "m" ways and second can occur in "n" ways (after the 1st has occured), then the two events can occur in m×n ways.

ex. An ice-cream store offers 3 diff. types of cones, and 31 flavors. How many diff single-scoop orders can be made?

$3 \times 31 = 93$

ex. 2 In a certain state, automobile license plates display 3 letters followed by 3 numbers. How many diff. such plates are possible if repetition is . . .

a) allowed?

May Certain 2016

$26\ 26\ 26\ 10\ 10\ 10$

$= 26^3 10^3 = 17{,}576{,}000$

b) Not allowed?

$26\ 25\ 24\ 10\ 9\ 8$

$= 11{,}232{,}000$

$10\ 10 = 100$