

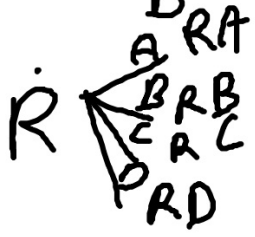
3 jeans

P
Q
R



4 shirts

A
B
C
D



12

How many "clothing" combinations can you have?

$$3 \times 4 = 12$$

Fundamental Counting Principle

- Suppose that two events occur in order. If the 1st can occur in m ways and 2nd in n ways (after 1st has occurred), then the two events can occur in $m \times n$ ways.

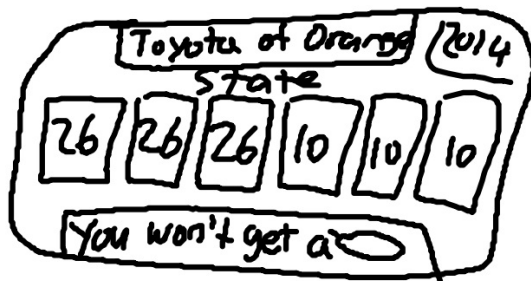
Ex. 1 An ice cream store offers 3 types of cones, and 31 flavours. How many possible single-scoop ice cream cones can be made?

Event 1: 3

Event 2: 31

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

Ex 2. In a certain state, car license plates display 3 letters followed by 3 numbers. How many unique license plate can be made?



a) Repetition allowed. $26 \times 26 \times 26 \times 10 \times 10 \times 10 = 26^3 \times 10^3 = 17,576,000$

b) Repetition allowed for numbers only

$26 \times 25 \times 24 \times 10 \times 10 \times 10 = 15,600,000$

Phone #

10 10 10 - 10 10 10 10

$$10^7 = 10,000,000$$

Factorial (!) (Ex. $4! = 4 \times 3 \times 2 \times 1$)

Ex. In how many different ways can a race with six runners be completed? Assume no tie.

6 5 4 3 2 1

$$6 \times 5 \times 4 \times 3 \times 2 \times 1 = 6! = \boxed{720}$$