8.2 –A- Arrangements, Permutations

A Permutation is an ordered arrangement where ALL or SOME of the items in a set are used.

EX 1. How many ways can 8 athletes receive gold, silver and bronze medals?

Ex 2 How many 4 letter sequences can be made with the vowels a,e,i,o,u & y without repeating?

Ex 3: How many different ways can you arrange 6 books on the shelf?
(order matters and there is no repetition of a book)

There is a notation for writing this in short:
6! We read it 6 factorial.
On the calculator it is n!.
n! = n x (n-1) x (n-2) x .....x 3 x 2 x 1.
Note that 0! = 1

Evaluate these Factorials

$4! =$ _____ $\quad \frac{8!}{3!} =$ _____

$5! =$ _____ $\quad \frac{11!}{7!} =$ _____

$9! =$ _____ $\quad \frac{10!}{2!6!} =$ _____

Ex 4: If out of the 6 books, **4 are French** and **2 are English**.
How many ways can we arrange them if:

a) We want to keep the same languages together?

Ex 4: If out of the 6 books, **4 are French** and **2 are English**.
How many ways can we arrange them if:

b) We want just French together?

Ex 4: If out of the 6 books, **4 are French** and **2 are English**.
How many ways can we arrange them if:

c) We want just English together?

Ex 5: A die is thrown 2 times and the results are recorded.
(order matters and repetition is allowed)

Practice:
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Why is 0! = 1