

# C12 - 11.0 - Combinatorics Review

A man has 4 pairs of shoes, 3 dresses and 5 hats. How many different outfits can she wear?

How many 6 digit even numbers are there?

Simplify  $\frac{1001!}{999!} = \frac{10! - 9!}{8!} = \frac{10!}{8!} - \frac{9!}{8!}$        $\frac{n!}{(n-2)!} =$       Factor  $n! + (n+1)!$

If you flip a coin seven times what is the total number of outcomes? Draw a tree diagram to confirm.

If a test has 20 true and false questions how many answer keys are there possible?

**Arrange All the Letters of ABC**  
**No restrictions (repeats allowed)**  
**No repeats - Order Matters**  
**No repeats - Order Doesn't Matter**

**Arrange All the Letters of ABC**  
**(Two at a time)**  
**No restrictions (repeats allowed)**  
**No repeats - Order Matters**  
**No repeats - Order Doesn't Matter**

FCP  
 Factorials  
 Combinations  
 Permutations  
 Repeats  
 Cases  
 Algebra  
 Pathways  
 Binomial Theorem

How many 4 digit **EVEN** numbers can we make from the numbers 0,1,2,3 with no repeats?

**A class is voting on a president, secretary and treasurer out of the 10 people running. How many different choices are there?**

**A class is voting on a committee of 3 people out of the 10 people running. How many different choices are there?**

**We have three boys and four girls. How many different ways can we make a group of three:**  
**With no restrictions?**  
**With exactly two boys and one girl?**  
**With at least one boy?**

**We have 10 boys and 11 girls. How many different ways can we make a group of 10 with at least one boy?**

A family of 5 takes a family photo. How many ways can the parents not sit together? Answer. The total number of ways the family can sit with no restrictions, Minus the number of ways they can sit Together. Think about it! Very Useful!

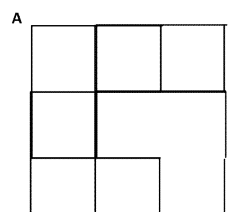
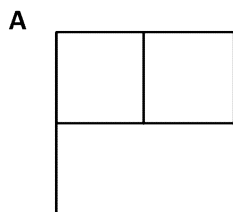
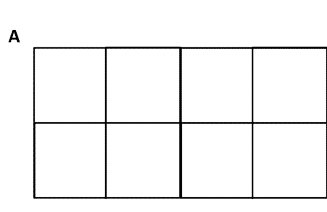
**How many different words can we make from the letters POOL? POLO? PEEP**

**A ten question multiple choice exam has solutions as follows: 5 A's, 3 B's, 1 C, 1 D. In how many different combinations could these answers be ordered?**

Solve  
 ${}^nC_2 = 10$   
 ${}^nP_2 = 42$   
 ${}^nC_3 = 4$   
 ${}^3C_r = 3$

**Find the term and term #.**  
 $\ln(x^2 + 2)^3$  with  $x^4$ ?  
 $\ln(x^2 + 2)^3$  is a constant?  
 $\ln(x^2 - \frac{1}{x})^{10}$  has  $x^{11}$ ?

How many ways can you get from A to B if you may only travel east and south?



How many ways can you get from one corner of a standard Rubik's cube to an opposite diagonal corner?