Combinations

A combination is an arrangement of objects in which order does not matter

MATH→PRB→ 2 permutation   MATH→PRB→ 3 combination

- nPr or $P(n,r)$ - nCr or $C(n,r)$

- $\dfrac{n!}{(n-r)!}$ - $\dfrac{n!}{(n-r)!r!}$

- order matters   - order doesn't matter

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Single -Set

From a list of 10 books, how many different groups of 5 can be selected?

n = total # of objects   10
r = # of objects chosen   5

$C(10,5)$ OR $_{10}C_5$

$= 252$

$\dfrac{10!}{(10-5)!5!}$

Hungry Howie's is having a special...
    4 toppings for the price of 2

If they have 12 toppings to choose from, how many different pizzas can be made?

from, how many different pizzas
can be made?

$$_{12}C_4$$

$$C(12,4) = 495$$

$$\left(\frac{12!}{(12-4!)4!}\right)$$

Multiple Sets

· multiply the combinations using the
basic counting principle

$$_nC_r \cdot {_nC_r} \cdot {_nC_r} \ldots$$

From a group of 4 men and 5 women,
how many committees of 2 women and
3 men can be formed?

$$_4C_3 \cdot {_5C_2} = 40$$

A bag contains 3 red, 5 white, 8 blue
marbles. In how many ways can
you choose 2 red, 3 blue, and 1 white?

$$_3C_2 \cdot {_5C_1} \cdot {_8C_3} = 840$$