

① Choosing r items from n , when order matters: ^{w/o replacement} permutation

$$n=30$$

$$r=4$$

$$30 \cdot 29 \cdot 28 \cdot 27 = \frac{30!}{26!}$$

$${}_n P_r = \frac{n!}{(n-r)!}$$

② Choosing r items from n , when
order doesn't matter: combinations

$$\binom{n}{r} = {}_n C_r = \frac{n!}{(n-r)! r!} \quad \text{"n choose r"}$$

- ① Experiment
- ② Outcomes (of experiment)
- ③ Events — sets of outcomes
- ★④ Probabilities of events

$S = \{0, 1, 2, \dots\}$ discrete (finite or countable)

$S = (0, \infty)$ continuous

Experiment, sample space S ,
events A & B .

union $A \cup B$

intersection $A \cap B$



