



Distinguish permutations from combinations

1 Order matters

Order matters

A	B
Permutation	Combination

2 ${}_5\text{P}_2$

${}_5\text{P}_2$

A	B
Permutation	Combination

3 ${}_nC_r = \frac{n!}{r!(n-r)!}$

A	B
Combination	Permutation

4 ${}_nC_r = \frac{n!}{r!(n-r)!}$

A	Order does not matter
B	Order matters

5 Combination

Combination

A	B
${}_nC_r = \frac{n!}{r!(n-r)!}$	${}_nC_r = \frac{r!(n-r)!}{n!}$
C	D
${}_nC_r = \frac{n!}{r!}$	${}_nC_r = \frac{n!}{r!(n-r)!}$

6 ${}_5\text{C}_2$

${}_5\text{C}_2$

A	B
${}_nC_r = \frac{n!}{r!(n-r)!}$	${}_nC_r = \frac{n!}{r!(n+r)!}$
C	D
${}_nC_r = \frac{r!(n-r)!}{n!}$	${}_nC_r = \frac{n!}{r!(n-r)!}$

7 Order does not matter

Order does not matter

A	B
${}_nC_r = \frac{n!}{r!(n-r)!}$	${}_nC_r = \frac{n!}{r!}$
C	D
${}_nC_r = \frac{n!}{(n-r)!}$	${}_nC_r = \frac{r!(n-r)!}{n!}$

8 ${}_nP_r = \frac{n!}{(n-r)!}$

A	B
${}_3\text{P}_2$	${}_1\text{P}_2$
C	D
${}_2\text{P}_1$	${}_3\text{P}_1$



Distinguish permutations from combinations

9

From 4 songs, 3 are placed into a numbered playlist order. How many playlists are possible?

From 4 songs, 3 are placed into a numbered playlist order. How many playlists are possible?

A ${}_3C_3$

B ${}_4P_3$

C ${}_4C_1$

D ${}_3C_4$

10

From 6 volunteers, a committee of 2 members is formed. How many committees are possible?

From 6 volunteers, a committee of 2 members is formed. How many committees are possible?

A ${}_nC_r = \frac{n!}{(n-r)!}$

B ${}_nC_r = \frac{n!}{r! (n-r)!}$

C ${}_nC_r = \frac{n!}{r! (n+r)!}$

D ${}_nC_r = \frac{n!}{r! + (n-r)!}$

11

From a group of 6 options how many ways are there to choose 4 options in a specific order?

From a group of 6 options how many ways are there to choose 4 options in a specific order?

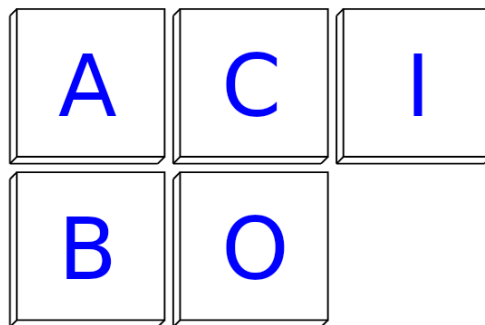
A $\frac{6!}{4! \cdot 2!}$

B $\frac{4!}{2!}$

C $\frac{6!}{2!}$

12

How many total ways can 2 letter tiles be drawn from this set? Show as a factorial.



A $\frac{7!}{3! \cdot 4!}$

B $\frac{5!}{3!}$

C $\frac{4!}{2! \cdot 2!}$

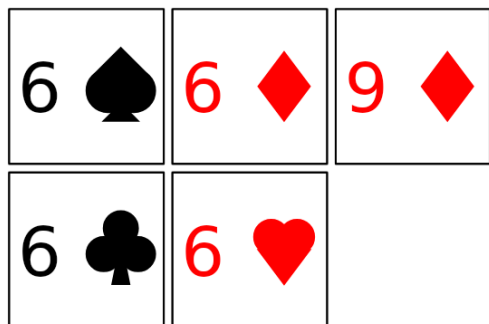
D $\frac{5!}{2! \cdot 3!}$

E $\frac{2!}{5! \cdot 3!}$

F $\frac{6!}{2! \cdot 4!}$

13

How many total ways can 3 cards be drawn from this set? Show as a factorial.



A $\frac{5!}{3! \cdot 2!}$

B $\frac{3!}{5! \cdot 2!}$

C $\frac{5!}{2!}$

D $\frac{3!}{3! \cdot 0!}$

14

${}_5P_3 = 60$ and $3! = 6$
 ${}_5P_3 = 60$ and $3! = 6$

A ${}_5C_3 = 10$

B ${}_5C_3 = 60$

C ${}_5C_3 = 54$

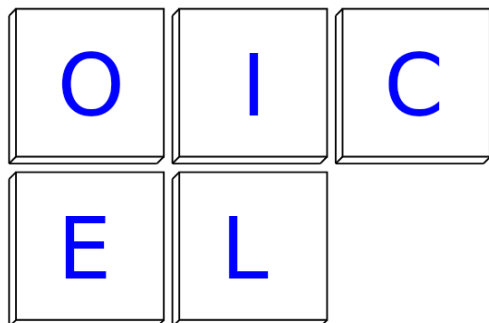
D ${}_5C_3 = 66$



Distinguish permutations from combinations

15

How many ways can 2 vowels be drawn from this set? Show as a factorial.



A	$\frac{4!}{3! \cdot 1!}$	B	$\frac{3!}{2! \cdot 1!}$
C	$\frac{2!}{3! \cdot 1!}$	D	$3!$
E	$\frac{5!}{3! \cdot 2!}$		

18

From 4 different coloured flags, 2 are arranged in a row along a flagpole. How many arrangements are possible?

From 4 different coloured flags, 2 are arranged in a row along a flagpole. How many arrangements are possible?

A	12	B	13
C	6	D	2

16

${}_5C_4 = 5$ and $4! = 24$

$${}_5C_4 = 5 \quad \text{and} \quad 4! = 24$$

A	${}_5P_4 = 24$
B	${}_5P_4 = 29$
C	${}_5P_4 = 120$
D	${}_5P_4 = 5$

17

From 3 contestants, distinct first, second, and third prizes are awarded to 2 winners. How many ways are there?

From 3 contestants, distinct first, second, and third prizes are awarded to 2 winners. How many ways are there?

A	$3!$	B	$\frac{3!}{2! \cdot 1!}$
C	$4!$	D	$2!$