

STAT 3021 Lab 3

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February 1, 2020

Chapter covered:

- Chapter 2.1, 2.2 Sample space and event
- Chapter 2.3 Counting sample point
- Chapter 2.4 Probability

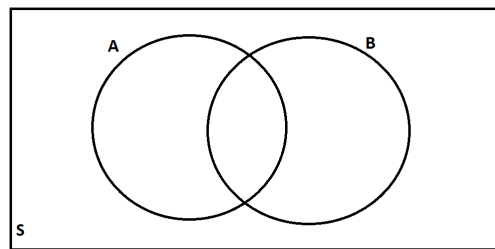
Key points:

- Whether allow repetition/replace
- Whether order matters
- Addition principle
- Multiplication principle

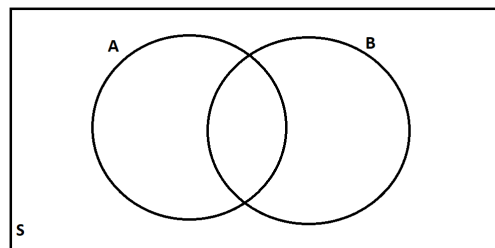
	Replace	
Ordered \	Yes	No
Yes	n^k	P_n^k
No	C_{n+k-1}^{k-1}	C_n^k

Table 1: Summary table for combinations

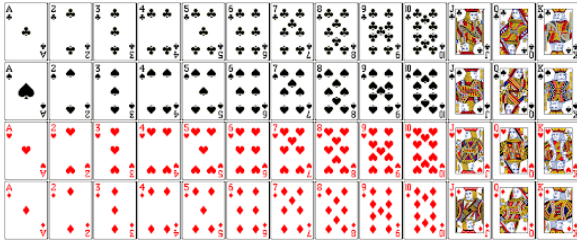
1. Suppose you role two dice and observe the result. Let A be the event where the sum of two numbers is 7. Let B be the event where the product (result of multiplication) of two numbers is 6. Write A and B and $A \cap B$.
2. Using the Venn diagram below to shade the area representing $A \cup B'$



3. Using the Venn diagram below to shade the area representing $A' \cap B$



4. An artist has 9 paintings. How many ways can he hang 4 paintings side-by-side on a gallery wall?
5. An art gallery displays 10 distinct paintings in a row. Of these paintings, 2 are by Van Gogh, 5 are by Picasso, 3 by Monet. Find the number of different ways the paintings can be displayed if the paintings by each of the artists are kept together.
6. A combination lock has a total of 40 numbers on its face and will unlock given the proper three-number sequence. How many unique combinations are possible?
7. A combination lock has a total of 40 numbers on its face and will unlock given the proper three-number sequence. How many unique combinations are possible **if no numbers are repeated**?
8. Five cards are randomly selected from a standard 52-card deck. Find the total number of possible hands.
9. Five cards are randomly selected from a standard 52-card deck. Find the total number of possible hands that all 5 cards are the same suit.



10. Suppose you have 8 children, A, B, C, D, E, F, G, H. You plan to get a lot of groceries and you need 3 children to come with you. Your youngest child H wants to do whatever A does (i.e. If A goes, H goes. If A stays home, H stays home). In how many different ways can you select 3 children to come with you?