

Def: 1) $n(A)=1$: 基本事件.

2) S : 必然事件

3) ϕ : 不可能事件

4) A' : 余事件.

5) $A \cup B$: 和事件

6) $A \cap B$: 積事件

* 7) $A \cap B = \phi \Rightarrow A, B$ 互斥「互斥事件」.

Ex 6.

sol: $A = \{(1,1) \cdots (6,6)\}$

$B = \{(4,6) (5,5) (6,4)\}$.

$A \cap B = \{(5,5)\}$.

$$n(A \cup B) = n(A) + n(B) - n(A \cap B)$$

$$= 6 + 3 - 1 = 8.$$

12.2 求机率問題

Def Suppose $S \neq \emptyset$. If every element events of S , they probability are equal, then the probability of A is denoted by.

$$P(A) = \frac{n(A)}{n(S)}.$$

(古典机率)

Thm: Suppose S is sample space, and A, B are events.

1) $P(\emptyset) = 0$

2) $P(S) = 1$

3) $0 \leq P(A) \leq 1$.

4) $P(A^c) = 1 - P(A)$

5) $A \subseteq B \implies P(A) \leq P(B)$

6) $P(A \cup B) = P(A) + P(B) - P(A \cap B)$.

7) $P(A - B) = P(B) - P(A \cap B)$.

Ex1. $P(A) = \frac{1}{4}$. $P(B) = \frac{1}{3}$. $P(A \cap B) = \frac{1}{12}$.

sol: $P(A') = 1 - P(A) = 1 - \frac{1}{4} = \frac{3}{4}$.

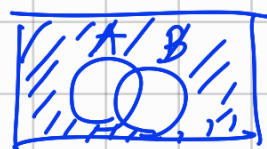
$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

$$= \frac{1}{4} + \frac{1}{3} - \frac{1}{12} = \frac{1}{2}$$



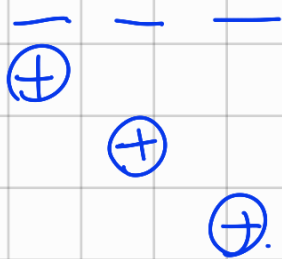
$$P(A' \cap B) = P(B) - P(A \cap B)$$

$$= \frac{1}{3} - \frac{1}{12} = \frac{1}{4}$$



$$P(A' \cap B') = 1 - P(A \cup B) = 1 - \frac{1}{2} = \frac{1}{2} //$$

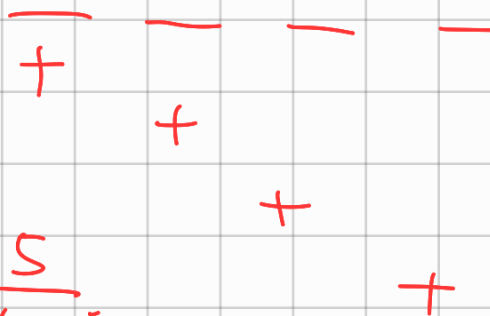
Ex2.



$$\left(\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}\right) \times 3 = \frac{3}{8} //$$

S₂. 3 $\overline{A} | \overline{B}$ + 4 \overline{A}

$$4 \left(\frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}\right) + \frac{1}{16} = \frac{5}{16}$$



Ex3. $\text{sum} > 9$ Remark: 6×6 矩阵法.

sol: $\text{Sum} = \textcircled{10} + \textcircled{11} + \textcircled{12}$
 $= \frac{3}{36} + \frac{2}{36} + \frac{1}{36} = \frac{1}{6}$

Ex4. A, B, C 不相容

sol:
D E F G
1 1 1 1 1

$$P(A) = \frac{n(A)}{n(S)} = \frac{4! C_3^5 \cdot 3!}{7!} = \frac{2}{7}$$

Ex5.

sol: $P(A) = \frac{C_1^8}{C_3^{10}} = \frac{8}{120} = \frac{1}{15}$