$A, B, C \neq \emptyset$

Ex 2.10

Ex 2.11

1) Arrangement ordinaire

$A_n^k = n(n-1)\cdots(n-k+1)$ ou $\frac{n!}{(n-k)!}$

2) Combinaison sans répétition

$C_n^k = \binom{n}{k} = \frac{n!}{k!(n-k)!}$

3) Arrangement sans répétition

$A_n^k = \frac{n!}{(n-k)!}$ ou n^k

Ex 2.12 Tj ∩ Tj pas

Ex 2.13

Tj pas!

Tj pas!

Ex 2.14

	$A_1 \cap C$	$A_2 \cap C$	$A_3 \cap C$
C	$\{1,2\}$	$\{4\}$	$\{6\}$
C	$\{1\}$	$\{3\}$	$\{5\}$
Effectif	2	2	2

Ex 2.15 ① $A = \{(1,1),(1,2),(1,3),(2,1),(2,2),(2,3),(3,1),(3,2)\}$

$P(A) = \frac{|A|}{|\Omega|} = \frac{8}{9}$

② $A = \{1,2,3\}$

$P(A) = 1$

$P(A) = 1 \Leftrightarrow$ pas 1 ou 2 ou 3

Cas à $P(A) = 1$ ou $P(A) = 0$

ex: $P(A) = 1$

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③ $C = C_1 \cup C_2$, $C_1 \cap C_2 = \emptyset$

$\Rightarrow C_1 = C_2$ ou $C_1 \neq C_2$

$P(C) = P(C_1 \cup C_2) = P(C_1) + P(C_2) \Rightarrow$

$C \cap C$ ou $C_1 \neq C_2$

$P(C) = 1 \Leftrightarrow P(C_1) = 1$

$\Rightarrow P(C_2) = 0$

$\Rightarrow P(C_1 \cap C_2) = 0$

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④ $P(A \text{ ou } B \text{ ou } C) = \frac{|A \cup B \cup C|}{|\Omega|} = \frac{|A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|}{|\Omega|}$

$P(B) = \frac{C_1 \cup C_2}{C_3} = \frac{P(C_1 \cup C_2)}{P(C_3)} = \frac{P(C_1) + P(C_2) - P(C_1 \cap C_2)}{P(C_3)} = \frac{1 + 1 - 0}{1} = 2$

$C \cap C_3$

$C \cap C_3 \neq \emptyset$ ou $C \cap C_3 = \emptyset$

$C \cap C_3 = \emptyset \Rightarrow P(C \cap C_3) = 0$

$P(C_1 \cup C_2 \cup C_3) = \frac{C_1 \cup C_2 \cup C_3}{C_3} = \frac{P(C_1 \cup C_2 \cup C_3)}{P(C_3)} = \frac{P(C_1) + P(C_2) + P(C_3) - P(C_1 \cap C_2) - P(C_1 \cap C_3) - P(C_2 \cap C_3) + P(C_1 \cap C_2 \cap C_3)}{P(C_3)}$

$P(C_1) = P(C_2) = P(C_3) = 1$

$P(C_1 \cap C_2) = P(C_1 \cap C_3) = P(C_2 \cap C_3) = 0$

$P(C_1 \cap C_2 \cap C_3) = 0$

$P(B) = \frac{C_1 \cup C_2 \cup C_3}{C_3} = \frac{P(C_1 \cup C_2 \cup C_3)}{P(C_3)} = \frac{1 + 1 + 1 - 0 - 0 - 0 + 0}{1} = 3$

Ex 2.16 Ex 2.1

	F	C	M
F	14	16	18
C	15	18	20
M	16	19	20

$P(A \cap B) = \frac{|A \cap B|}{|\Omega|} = \frac{|A| + |B| - |A \cup B|}{|\Omega|}$

Ex 2.17 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|} = \frac{3}{9}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

③ $P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|} = \frac{5}{9}$

Ex 2.18 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.19 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.20 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.21 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.22 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.23 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.24 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$

Ex 2.25 ① $P(A \cap B) = \frac{|A \cap B|}{|\Omega|}$

② $P(A \cup B) = \frac{|A \cup B|}{|\Omega|}$

$P(A \cup B) = \frac{|A \cup B|}{|\Omega|} = \frac{|A| + |B| - |A \cap B|}{|\Omega|}$