Ex 1 :

1) $P\big((2,2,1)\big) = ?$

$$\Omega = \{ (1,1,1) ; (1,1,2) ; (1,2,1) ; (2,1,1) ; (1,2,2) ; (2,1,2) ; (2,2,1) ; (2,2,2) \}$$

$$P\big((2,2,1)\big) = \frac{1}{8}$$

2) Par exemple : $X\big((2,2,1)\big) = 2+2+1 = 5$

Liste de valeurs possibles pour X :

$$X\big((1,1,1)\big) = 3$$

$$X\big((1,1,2)\big) = X\big((1,2,1)\big) = X\big((2,1,1)\big) = 4$$

$$X\big((1,2,2)\big) = X\big((2,1,2)\big) = X\big((2,2,1)\big) = 5$$

$$X\big((2,2,2)\big) = 6$$

Les probabilités correspondantes :

$$P(X=3) = P\big((1,1,1)\big) = \frac{1}{8}$$

$$P(X=4) = P\big((1,1,2)\big) + P\big((1,2,1)\big) + P\big((2,1,1)\big) = \frac{3}{8}$$

$$P(X=5) = \frac{3}{8} \qquad P(X=6) = \frac{1}{8}$$

Loi de probabilité de X :

x	3	4	5	6
$P(X=x)$	$1/8$	$3/8$	$3/8$	$1/8$

3) $P(X \leq 4) = \frac{1}{8} + \frac{3}{8} = \frac{4}{8} = \frac{1}{2}$

4) $E(X) = \sum xp =$

$= 3 \times \frac{1}{8} + 4 \times \frac{3}{8} + 5 \times \frac{3}{8} + 6 \times \frac{1}{8} =$

$= \frac{3+12+15+6}{8} = 4{,}5$

$V(X) = \sum x^2 p - [E(X)]^2 =$

$= 3^2 \times \frac{1}{8} + 4^2 \times \frac{3}{8} + 5^2 \times \frac{3}{8} + 6^2 \times \frac{1}{8} - (4{,}5)^2 =$

$= 0{,}75$

$\sigma(X) = \sqrt{V(X)} = 0{,}866$

Ex 2 : $P(A) = 0{,}02 \quad P(B) = 0{,}04$

$P(A \cap B) = P(A) \times P(B)$

1) a) $P(A \cap B) = 0{,}02 \times 0{,}04 = 0{,}0008$

b) $P(\bar{A} \cap \bar{B}) = 0{,}98 \times 0{,}96 = 0{,}9408$

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

$= 0{,}02 + 0{,}04 - 0{,}0008 = 0{,}0592$

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

$= 0{,}0592 - 0{,}0008 = 0{,}0584$

2) a) $X\big((A \cup B) \setminus (A \cap B)\big) = 1$

$X(A \cap B) = 2 \quad X(\bar{A} \cap \bar{B}) = 0$

b)

x	0	1	2
$P(X = x)$	0,9408	0,0584	0,0008

c) $E(X) = 0 \times 0{,}9408 + 1 \times 0{,}0584 + 2 \times 0{,}0008 =$

$= 0{,}06$

d) $V(X) = 1^2 \times 0{,}0584 + 2^2 \times 0{,}0008 - 0{,}06^2 =$

$= 0{,}058$

$\sigma(X) = \sqrt{0{,}058} = 0{,}24$