

LDDR - Niveau 1 - TE 1: Comb - Prob.

EXERCICE 1

$$1) \binom{10}{4} = 210 \quad 2) \binom{6}{2} \cdot \binom{4}{2} = 90$$

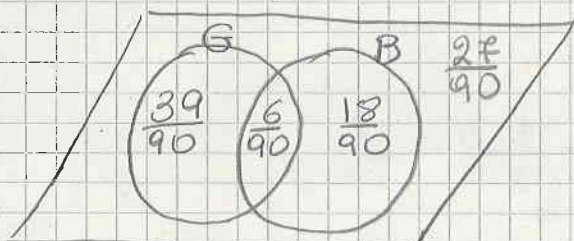
$$3) A_{4}^{10} = 5040$$

EXERCICE 2

1) On choisit les 6 places pour le "pile", $\binom{12}{6} = 924$
les restes sont "face".

2) $\left. \begin{array}{l} F P F \dots F P \\ P F P \dots P F \end{array} \right\} 2 \text{ cas}$

EXERCICE 3



$$P(G) = \frac{45}{90} \Rightarrow P(\bar{G}) = \frac{45}{90}$$

$$P(G \cap \bar{B}) = \frac{39}{90}$$

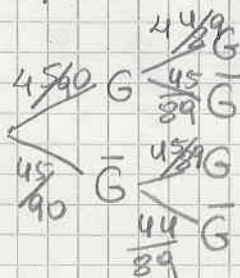
$$P(B) = \frac{24}{90} \Rightarrow P(\bar{B}) = \frac{66}{90}$$

$$P(B \cap \bar{G}) = \frac{18}{90}$$

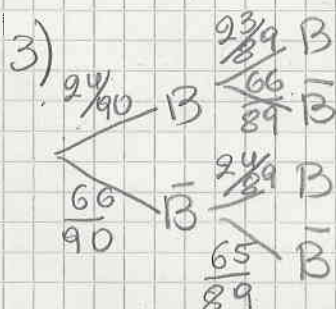
a) 1) $P(B \cap \bar{G}) = \frac{18}{90}$

2) $P(\overline{B \cap G}) = 1 - P(B \cap G) = 1 - (P(G) + P(B) - P(G \cap B)) =$
 $= 1 - \frac{45}{90} - \frac{24}{90} + \frac{6}{90} = \frac{27}{90}$

b) 1) $P(GG) = \frac{45}{90} \cdot \frac{44}{89} \approx 0.2472$



2) $P(G\bar{G}) + P(\bar{G}G) = \frac{45}{90} \cdot \frac{45}{89} \cdot 2 \approx 0.506$



3) $P(BB) + P(B\bar{B}) + P(\bar{B}B) =$
 $= 1 - P(\bar{B}\bar{B}) = 1 - \frac{66}{90} \cdot \frac{65}{89} \approx 0.4644$

$$4) P(2B|1G) = \frac{P(2B \cap 1G)}{P(1G)} = \frac{\frac{45}{90} \cdot \frac{24}{89}}{\frac{45}{90}} \approx 0.27$$

EXERCISE 4

$$P(A) = \frac{5}{9} \Rightarrow P(\bar{A}) = \frac{4}{9} \quad P(B) = \frac{2}{3} \Rightarrow P(\bar{B}) = \frac{1}{3}$$

$$P(A \cup B) = \frac{5}{6}$$

$$1) P(\bar{A} \cap \bar{B}) = P(\overline{A \cup B}) = 1 - P(A \cup B) = 1 - \frac{5}{6} = \frac{1}{6}$$

$$2) P(A \cup \bar{B}) = P(A) + P(\bar{B}) - P(A \cap \bar{B}) =$$

$$P(A) + P(\bar{B}) - (P(A) - P(A \cap B)) =$$

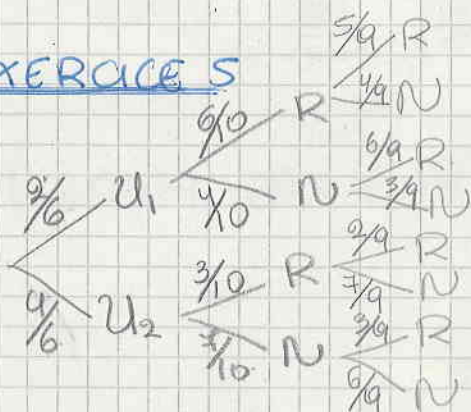
$$= P(A) + P(\bar{B}) - P(A) + P(A \cap B) = *$$

$$\cdot P(A \cap B) = P(A) + P(B) - P(A \cup B) = \frac{5}{9} + \frac{2}{3} - \frac{5}{6} = \frac{7}{18}$$

$$* = \frac{1}{3} + \frac{7}{18} = \frac{13}{18}$$

$$3) P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{7}{18}}{\frac{2}{3}} = \frac{7 \cdot 3}{18 \cdot 2} = \frac{7}{12}$$

EXERCISE 5



$$2) P(R) = \frac{2}{6} \cdot \frac{6}{10} + \frac{4}{6} \cdot \frac{3}{10} =$$

$$= \frac{2}{5} + \frac{1}{5} = \frac{3}{5}$$

$$3) P(U_1|R) = \frac{P(U_1 \cap R)}{P(R)} = \frac{\frac{2}{6} \cdot \frac{6}{10}}{\frac{3}{5}} = \frac{\frac{2}{5}}{\frac{3}{5}} = \frac{2}{3}$$

$$4) P(RR) = P(U_1 RR) + P(U_2 RR) = \frac{2}{6} \cdot \frac{6}{10} \cdot \frac{2}{9} + \frac{4}{6} \cdot \frac{3}{10} \cdot \frac{2}{9} =$$

$$= \frac{1}{9} + \frac{2}{45} = \frac{7}{45}$$

$$5) P(N \geq 1) = 1 - P(RR) = 1 - \frac{7}{45} = \frac{38}{45}$$