

4.3.6

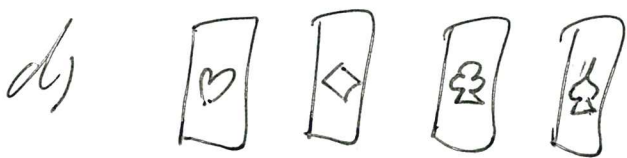
$$\#U = A_4^8 = 8 \cdot 7 \cdot 6 \cdot 5 = 1680$$

$$a) \frac{A_4^4}{A_4^8} = \frac{24}{1680} = \frac{1}{70} \approx 1,43\%$$

Il y a 24 façons de permuer 4 as.

$$b) \frac{1680 - A_4^4}{1680} = \frac{69}{70} \approx 98,57\% \quad \leftarrow \text{Des rois uniquement.}$$

$$c) \frac{A_4^4}{A_4^8}, \text{ ou qu'il y a 4 cartes rouges...}$$



$$\underbrace{2 \cdot 2 \cdot 2 \cdot 2}_{\text{AS/ROI}} \cdot 4! = 16 \cdot 24 = 384$$

↑  
Ordre

$$\Rightarrow \frac{384}{1680} = \frac{8}{35} \approx 22,86\%$$

# 4.3.6

$$e) \#U = 4 \cdot A_3^7 = 840$$

$$\#F = 24 \quad \Rightarrow \frac{24}{840} = \frac{1}{35} \approx 2.86\%$$

$$f) \#U = 2 \cdot A_3^7 = 420$$

$$\Rightarrow \frac{12}{420} = \frac{1}{35}$$

$$\#F = 2 \cdot 3 \cdot 2 \cdot 1 = 12$$

$$g) \#U = A_3^7 = 210$$

$$\Rightarrow \frac{6}{210} = \frac{1}{35}$$

$$\#F = 1 \cdot 3 \cdot 2 \cdot 1 = 6$$

4.3.7

$$a) \frac{C_2^4}{C_2^8} = \frac{A_2^4}{A_2^8} = \frac{6}{28} = \frac{12}{56} = \frac{3}{14}$$

$$\approx 0,2143$$

$$b) \frac{1}{C_2^8} = \frac{A_2^2}{A_2^8} = \frac{1}{28} = \frac{2}{56}$$

$$\approx 0,0357$$

$$c) \frac{C_2^8 - C_2^4}{C_2^8} = \frac{A_2^8 - A_2^4}{A_2^8} = \frac{22}{28} = \frac{44}{56}$$

$$= \frac{11}{14} \approx 0,7857$$

4.3.7

AVEC DES COMBINAISSONS

d) i) Nouvel univers:  $C_2^8 - C_2^4 = 22$

Deux as «et au moins 1 as»:  $C_2^4 = 6$

$$\Rightarrow p = \frac{6}{22} = \frac{3}{11}$$

ii) Nouvel univers:

$$\left. \begin{array}{l} 1 \text{ AS R exact: } C_1^2 \cdot C_1^6 \\ 2 \text{ AS R exact: } C_2^2 \end{array} \right\} 12 + 1 = 13$$

Deux as et «au moins un as rouge»:

$$\left. \begin{array}{l} 1 \text{ AS R exact: } C_1^2 \cdot C_1^2 \\ 2 \text{ AS R exact: } C_2^2 \end{array} \right\} 4 + 1 = 5$$

$$\Rightarrow p = \frac{5}{13}$$

4.3.7<sub>3</sub>

AVEZ DES COMBINAISSONS

iii) Nouvel umbers:

$\begin{array}{|c|} \hline AS \\ \hline \heartsuit \\ \hline \end{array}$   $\square$

$$1 \cdot C_1^7 = 7$$

Deux as et « l'as de coeur »:

$$1 \cdot C_1^3 = 3$$

$$P = \frac{3}{7}$$

4.3.7

AVEC DES ARRANGEMENTS

4

$$d) \quad i) \quad A_2^8 - A_2^4 = 44 = \#U$$

$$A_2^4 = \#F \quad \Rightarrow \quad p = \frac{12}{44} = \frac{3}{11}$$

$$ii) \quad 1 \text{ ASR exact: } A_1^2 \cdot A_1^6 \cdot 2! = 24$$

$$2 \text{ ASR exact: } A_2^2 = 2$$

$$\Rightarrow \#U = 26$$

$$\#F = A_1^2 \cdot A_1^2 \cdot 2! + A_2^2 = 8 + 2 = 10$$

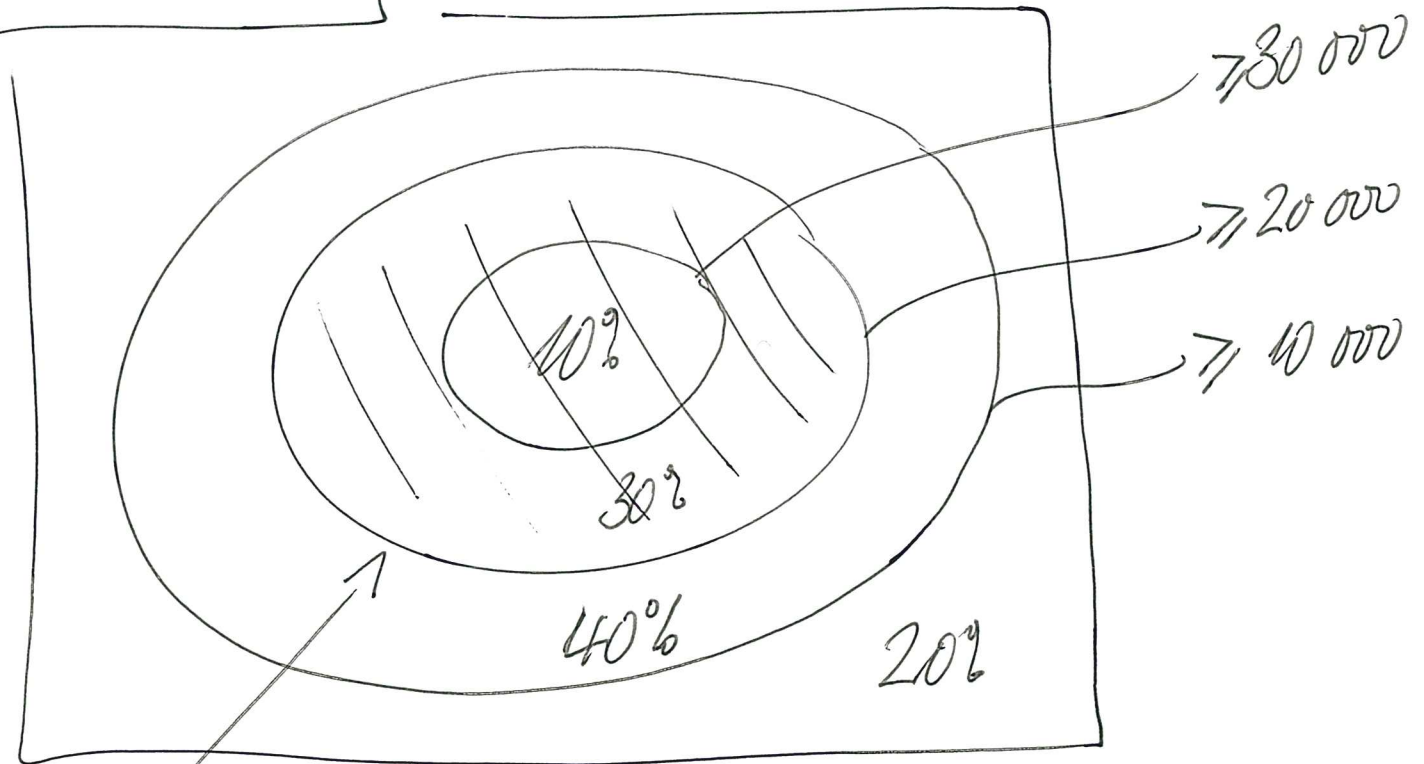
$$\Rightarrow p = \frac{10}{26} = \frac{5}{13}$$

$$iii) \quad \#U = 1 \cdot A_1^7 = 7$$

$$\#F = 1 \cdot A_1^3 = 3$$

$$\Rightarrow p = \frac{3}{7}$$

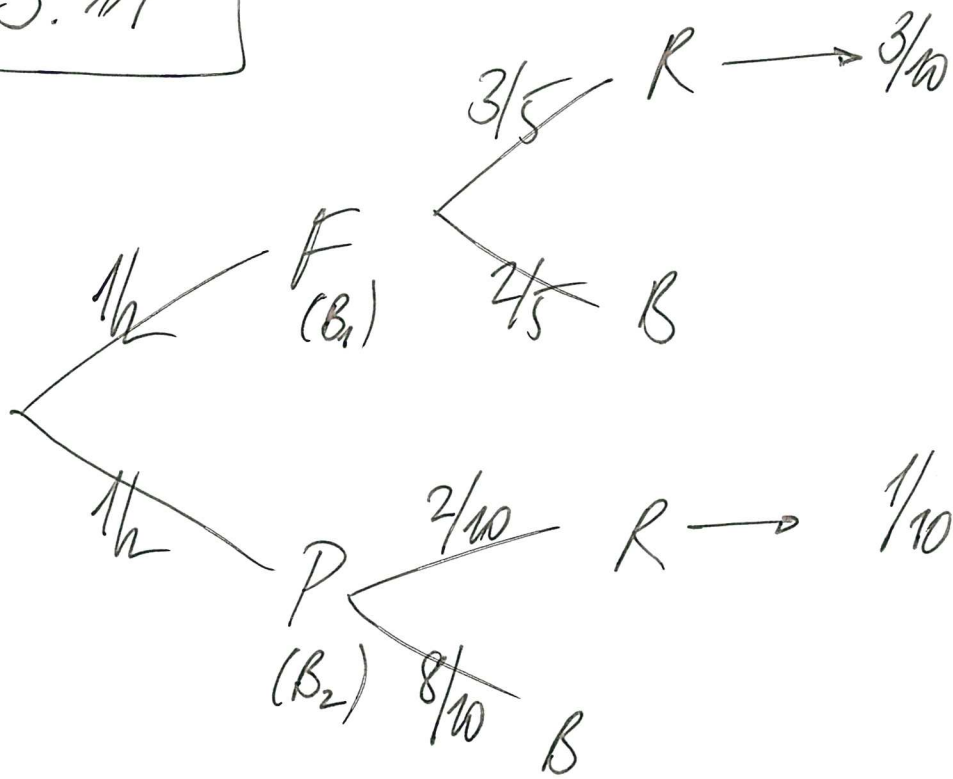
4.3.10



$$P(\geq 20000 \mid \geq 10000) = \frac{40\%}{80\%}$$
$$= 50\% = \frac{1}{2}$$

$$= \frac{P(\geq 20000 \wedge \geq 10000)}{P(\geq 10000)}$$

4.3.11



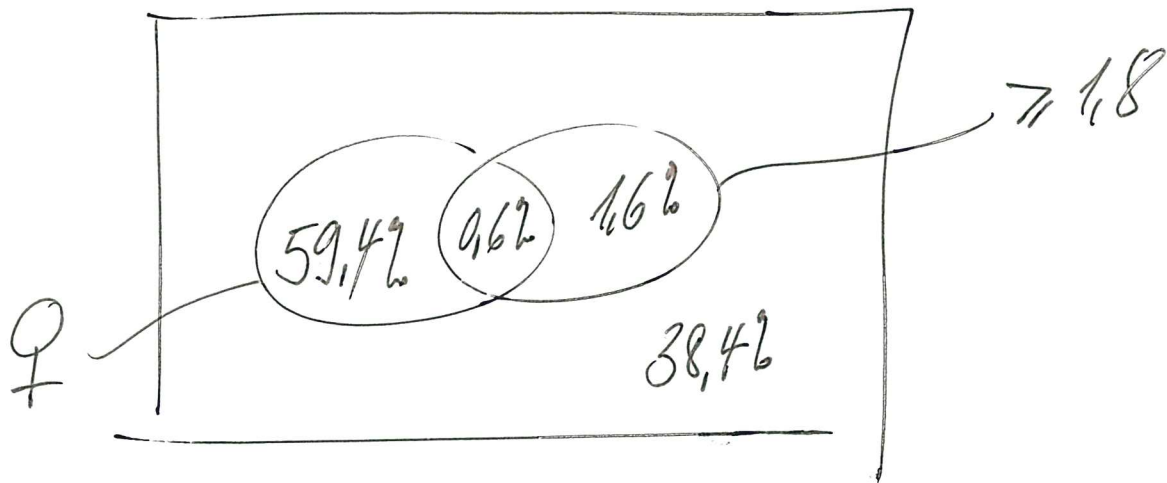
$$P(R) = \frac{4}{10} = \frac{2}{5}$$

$$P(B_1/R) = \frac{P(B_1 \text{ et } R)}{P(R)} = \frac{3/10}{2/5}$$

$$= \frac{15}{20} = \frac{3}{4} = 75\%$$



4.3.12



$$\text{♀} : 60\% \Rightarrow \text{♂} : 40\%$$

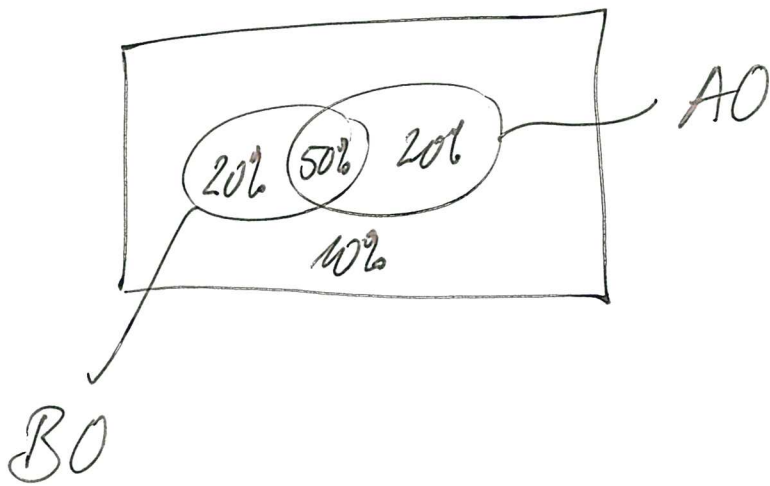
$$1\% \text{ de } 60\% \rightarrow 0,6\%$$

$$4\% \text{ de } 40\% \rightarrow 1,6\%$$

$$p(\text{♀} / \geq 1,8) = \frac{p(\text{♀ et } \geq 1,8)}{p(\geq 1,8)}$$

$$= \frac{0,6}{2,2} = \frac{6}{22} = \frac{3}{11}$$

4.3.13



a) 30%

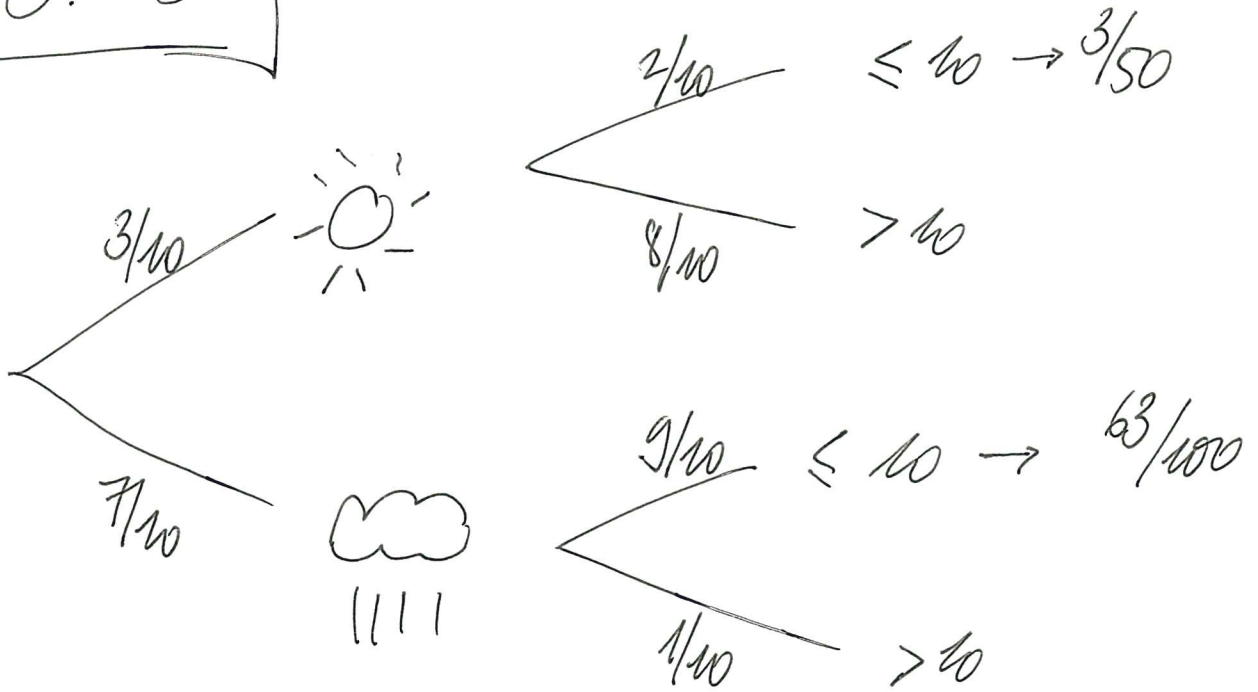
b) 10%

c) 50%

d) 40%

e) 
$$p(BL/AO) = \frac{p(BL \text{ et } AO)}{p(AO)}$$
$$= \frac{20}{70} = \frac{2}{7}$$

4.3.18

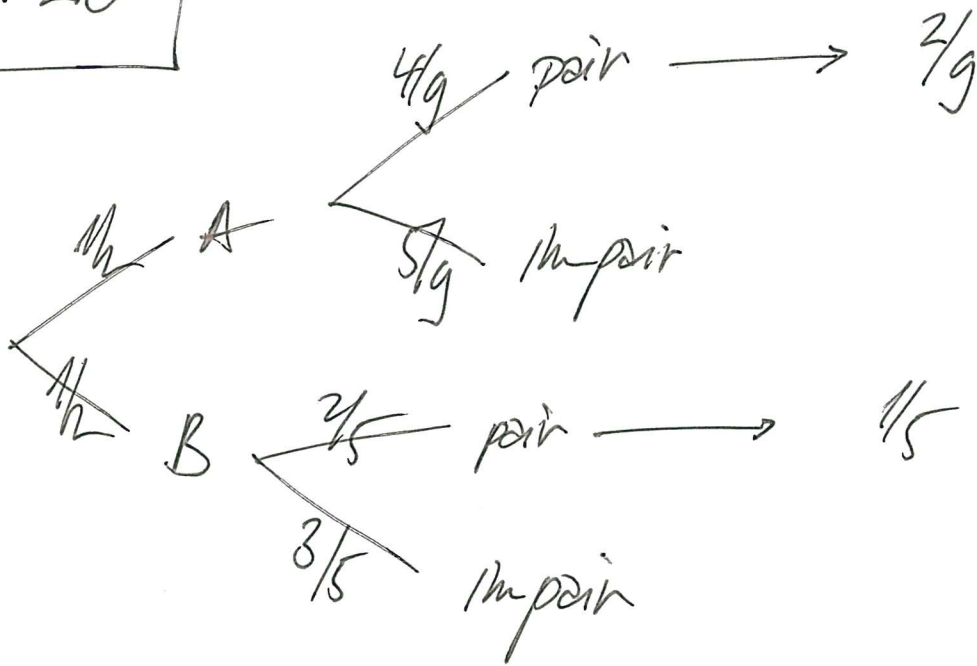


$$P(\text{cloud} \mid \leq 10) = \frac{P(\text{cloud and } \leq 10)}{P(\leq 10)}$$

$$= \frac{63/100}{69/100} = \frac{63}{69} = \frac{21}{23}$$

$$\approx 91.3\%$$

4.3.20



$$p = \frac{\frac{2}{9}}{\frac{2}{9} + \frac{1}{5}} = \frac{2}{9} \cdot \frac{5}{19} = \frac{10}{19}$$

$$\approx 0,5263$$