Ex 4.2.1

$\mathcal{U} = \{1; 2; 3; 4; 5; 6\}$ $\qquad \# \mathcal{U} = 6$

a) $P = \frac{1}{6}$ car $E = \{2\}$ $\quad \# E = 1$

b) $P = \frac{3}{6} = \frac{1}{2}$ car $E = \{2; 4; 6\}$ $\quad \# E = 3$

c) $P = \frac{2}{6} = \frac{1}{3}$ car $E = \{5; 6\}$ $\quad \# E = 2$

Ex 4.2.2

\# issues possibles : $36 = C_1^{36}$

a) $P = \frac{4}{36} = \frac{1}{9}$ car $E = \{A\heartsuit, A\diamondsuit, A\spadesuit, A\clubsuit\}$ $\quad \# E = 4$ ou C_1^4

b) $P = \frac{9}{36} = \frac{1}{4}$ car $E = \{A\diamondsuit, R\diamondsuit, \ldots, 6\diamondsuit\}$ $\quad \# E = 9$ ou C_1^9

c) $P = \frac{1}{36}$ car $E = \{V\heartsuit\}$ $\quad \# E = 1$ ou C_1^1

Ex 4.2.3

simultanément	successivement
\# issues possibles = $C_3^{36} = 7140$	\# issues possibles = $A_3^{36} = 36 \cdot 35 \cdot 34$
a) $\frac{C_3^4}{C_3^{36}} = \frac{4}{7140} = \frac{1}{1785} \cong 0,056\%$	$\frac{A_3^4}{A_3^{36}} = \frac{4}{36} \cdot \frac{3}{35} \cdot \frac{2}{34} = \ldots$
b) $\frac{C_2^4 \cdot C_1^4}{C_3^{36}} = \frac{6 \cdot 4}{7140} = \frac{2}{595} \cong 0,336\%$	$\frac{A_2^4 \cdot A_1^4 \cdot \overset{\text{place dame}}{3}}{A_3^{36}} = \frac{4}{36} \cdot \frac{3}{35} \cdot \frac{4}{34} \cdot 3 = \ldots$

c) au moins 1 valet $\Leftrightarrow$ tout - aucun valet

$$1-\frac{C_3^{32}}{C_3^{36}} = 1-\frac{4960}{7140} = 1-\frac{248}{357} = \frac{109}{357} \cong 30{,}53\%$$

$$1-\frac{A_3^{32}}{A_3^{36}} = 1-\frac{32}{36}\cdot\frac{31}{35}\cdot\frac{30}{34} = \ldots$$

Ex 4.2.4

$$\#\text{ issues possibles} = 2^4 = \underbrace{2}\cdot\underbrace{2}\cdot\underbrace{2}\cdot\underbrace{2} = \overline{A}_4^2 = 16$$

a) $P = \frac{1}{16}$ car # issue favorable $= 1 = \underset{P}{1}\cdot\underset{P}{1}\cdot\underset{F}{1}\cdot\underset{F}{1}$

b) $P = \frac{\overline{P}_4(2,2)}{2^4} = \frac{6}{16} = \frac{3}{8} = \frac{C_2^4}{2^4}$

$$\begin{pmatrix} PPFF & PFFP \\ PFPF & FPPF \\ FPPF & FFPP \end{pmatrix}$$

c) au plus 1 fois pile $\Leftrightarrow$ 0 fois pile ou 1 fois pile

$$1 + C_1^4 = 1+4 = 5$$

ou $1 + \overline{P}_4(3)$

$\Rightarrow P = \frac{5}{16}$

Ex 4.2.5

$$\#\text{ issues possibles} = 6^2 = 36$$

a) $P = \frac{6}{36} = \frac{1}{6}$ car $E = \{(1,1),(2,2),\ldots,(6,6)\}$ $\#E = 6$

b) $P = \frac{2}{36} = \frac{1}{18}$ car $E = \{(2R,5B),(5R,2B)\}$ $\#E = 2$

c) $P = \frac{1}{36}$ car $E = \{(2R, 5B)\}$ $\# E = 1$

d) $E = \{(1,6), (6,1), (2,5), (5,2), (3,4), (4,3)\}$ $\# E = 6$

$\Rightarrow P = \frac{6}{36} = \frac{1}{6}$

e) $E = \{(1,1), (1,2), (2,1)\}$ $\# E = 3$ $\Rightarrow P = \frac{3}{36} = \frac{1}{12}$

f) somme au plus égale à 11 $\Leftrightarrow$ somme = 2 ou 3 ou 4 ou ... ou 11

$\Leftrightarrow$ tout − somme = 12

$\Leftrightarrow$ 36 − 1 = 35

$\Rightarrow P = \frac{35}{36}$

Ex 4.2.6

simultanément

$$\frac{C_3^4 \cdot C_{10}^{48}}{C_{13}^{52}} \cong 4{,}12\%$$

successivement

nbre de place pour les rois.

$$\frac{A_3^4 \cdot A_{10}^{48} \cdot C_3^{13}}{A_{13}^{52}} \cong 4{,}12\%$$

Ex 4.2.8

$\#$ issues possibles $= C_3^{36} = 7140$

1 couleur, 3 cartes par couleur

a) $\frac{C_1^4 \cdot C_3^9}{C_3^{36}} = \frac{336}{7140} = \frac{4}{85} \cong 4{,}71\%$

b) $\frac{C_3^4}{C_3^{36}} = \frac{4}{7140} = \frac{1}{1785} \cong 0{,}06\%$

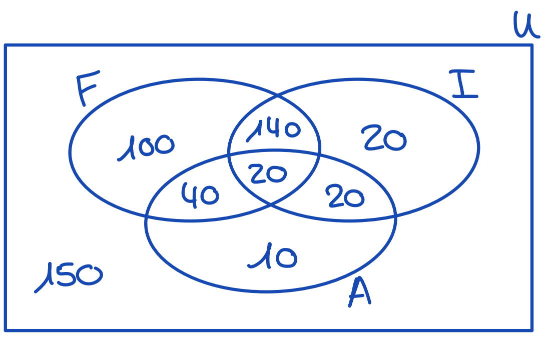
c) $\frac{C_1^4 \cdot C_2^4}{C_3^{36}} = \frac{4 \cdot 6}{7140} = \frac{2}{595} \cong 0{,}34\%$

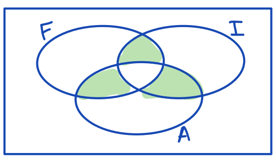
d) $\dfrac{\overset{\text{1 couleur}}{C_1^4} \cdot \overset{\text{2 cartes}}{C_2^9} \cdot \overset{\text{1 carte autre couleur}}{C_1^{27}}}{C_3^{36}} = \dfrac{4 \cdot 36 \cdot 27}{7140} = \dfrac{324}{595} \cong 54,45\,\%$

e) $\dfrac{C_2^{18} \cdot C_1^{18}}{C_3^{36}} = \dfrac{2754}{7140} = \dfrac{27}{70} \cong 38,57\,\%$

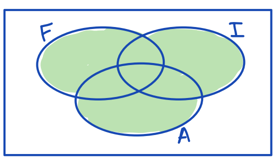
f) $\dfrac{C_1^4 \cdot C_1^4 \cdot C_1^4}{C_3^{36}} = \dfrac{4 \cdot 4 \cdot 4}{7140} = \dfrac{16}{1785} \cong 0,896\,\%$

Ex 4.2.9



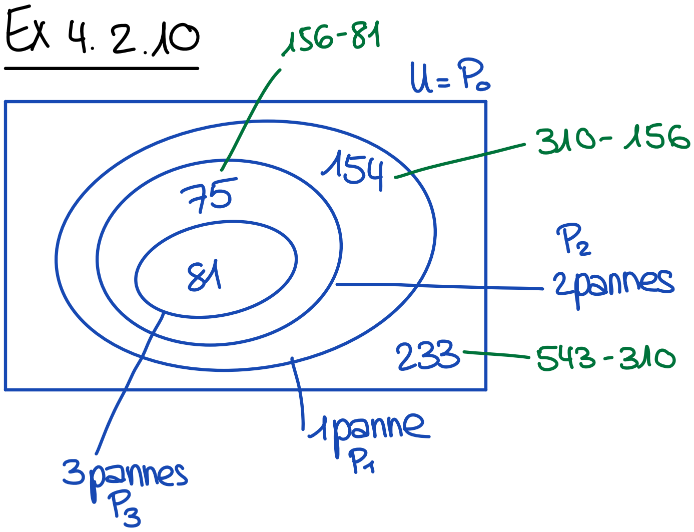
a) 

$P = \dfrac{140+40+20}{500} = \dfrac{200}{500} = \dfrac{2}{5} = 40\,\%$

b) 

$P = \dfrac{300+20+20+10}{500} = \dfrac{350}{500} = \dfrac{7}{10} = 70\,\%$

Ex 4.2.10



a) $P = \dfrac{154}{543} \cong 28,36\,\%$

b) $P = \dfrac{154+233}{543} = \dfrac{387}{543} \cong 71,27\,\%$

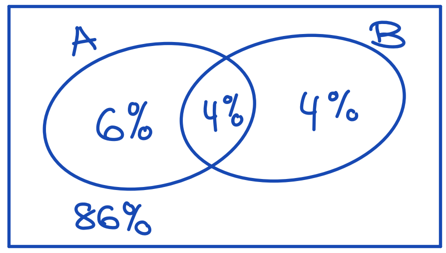
Ex 4.2.14

a) $P(A \cup B) = 6\% + 4\% + 4\% = \underline{14\%}$

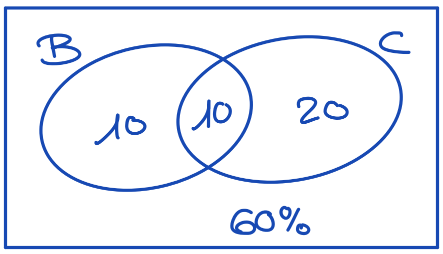
b) $P = \underline{6\%}$

c) $P = 6 + 4 = \underline{10\%}$

d) $P = 100\% - 6\% - 4\% - 4\% = \underline{86\%}$



Ex 4.2.15



$P(\overline{B \cup C}) = 60\% \Rightarrow P(B \cup C) = 100\% - 60\% = \underline{40\%}$

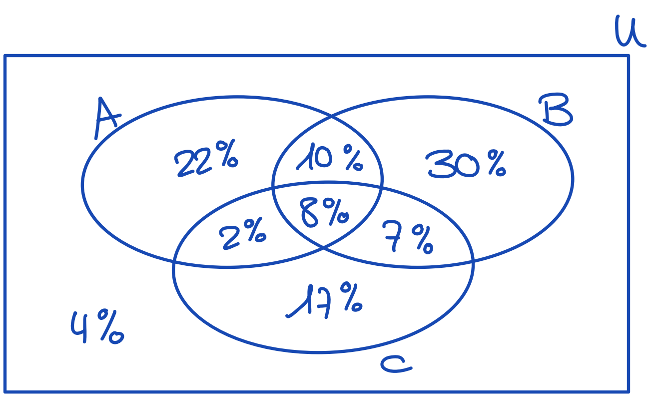
$P(B) = 20\%$ et $P(C) = 30\%$

Comme $P(B \cup C) = P(B) + P(C) - P(B \cap C) \Leftrightarrow 40 = 20 + 30 - P(B \cap C)$

$\Leftrightarrow 40 = 50 - P(B \cap C)$

$\Rightarrow P(B \cap C) = \underline{10\%}$

Ex 4.2.16



a) $P(A \cup B \cup C) = 42\% + 30\% + 7\% + 17\% = \underline{96\%}$

b) $P(\overline{A \cup B \cup C}) = 100\% - 96\% = \underline{4\%}$

c) $P = 10\% + 2\% + 7\% = \underline{19\%}$

d) $P = \underline{22\%}$