

$$1) \quad P(A) = 2 \cdot P(B) \quad \rightarrow P(A) = 4 \cdot P(C)$$

$$P(B) = 2 \cdot P(C)$$

$$P(\Omega) = P(A) + P(B) + P(C)$$

$$1 = P(A) + P(B) + P(C)$$

$$1 = 4P(C) + 2P(C) + P(C)$$

$$1 = 7P(C)$$

$$\rightarrow P(C) = \frac{1}{7}$$

$$\hookrightarrow P(A) = \frac{4}{7}$$

$$P(B) = \frac{2}{7}$$

1) Peut-on utiliser une autre variable? oui

$$\begin{aligned} \bullet \quad P(A) &= 2 P(B) & \rightarrow P(B) &= \frac{1}{2} P(A) \\ P(B) &= 2 P(C) & \rightarrow P(C) &= \frac{1}{2} P(B) = \frac{1}{4} P(A) \end{aligned}$$

$$P(\Omega) = 1 = P(A) + P(B) + P(C)$$

$$1 = P(A) + \frac{1}{2} P(A) + \frac{1}{4} P(A)$$

$$1 = \frac{4}{4} P(A) + \frac{2}{4} P(A) + \frac{1}{4} P(A)$$

$$1 = \frac{7}{4} P(A)$$

$$\hookrightarrow P(A) = \frac{4}{7}$$

$$\rightarrow P(B) = \frac{1}{2} \cdot \frac{4}{7} = \frac{2}{7}$$

$$\rightarrow P(C) = \frac{1}{4} \cdot \frac{4}{7} = \frac{1}{7}$$

$$\bullet \quad P(A) = 2 P(B)$$

$$P(B) = 2 P(C) \rightarrow P(C) = \frac{1}{2} P(B)$$

$$P(\Omega) = 1 = P(A) + P(B) + P(C)$$

$$1 = 2 P(B) + P(B) + \frac{1}{2} P(B)$$

$$1 = \frac{7}{2} P(B)$$

$$\hookrightarrow P(B) = \frac{2}{7}$$

$$\rightarrow P(A) = 2 \cdot \frac{2}{7} = \frac{4}{7}$$

$$P(C) = \frac{1}{2} \cdot \frac{2}{7} = \frac{1}{7}$$

2)

$$P(A) = 4 P(C)$$

$$P(B) = 3 P(C)$$

$$P(D) = P(B) = 3 P(C)$$

$$P(\Omega) = P(A) + P(B) + P(C) + P(D)$$

$$1 = 4 P(C) + 3 P(C) + P(C) + 3 P(C)$$

$$1 = 11 P(C)$$

$$\hookrightarrow P(C) = \frac{1}{11}$$

$$\hookrightarrow P(A) = \frac{4}{11}$$

$$P(B) = \frac{3}{11}$$

$$P(D) = \frac{3}{11}$$

$$\hookrightarrow P(D^c) = \frac{8}{11}$$

3)

$$P(A) = 3 P(C)$$

$$P(F) = 4 P(C)$$

$$P(E) = 4 P(F) = 16 P(C)$$

$$P(D) = \frac{2}{3} P(A) = \frac{2}{3} \cdot 3 P(C)$$

$$P(G) = \frac{1}{2} P(B) = \frac{1}{2} \cdot \frac{6}{5} P(C)$$

$$P(B) = \frac{2}{5} P(A) = \frac{2}{5} \cdot 3 P(C)$$

En résumé :

$$P(A) = 3 P(C)$$

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

$$P(C) = P(C)$$

$$P(D) = 2 P(C)$$

$$P(E) = 16 P(C)$$

$$P(F) = 4 P(C)$$

$$P(G) = \frac{3}{5} P(C)$$

$$P(\Omega) = P(A) + P(B) + P(C) + P(D) + P(E) + P(F) + P(G)$$

$$1 = 3 P(C) + \frac{6}{5} P(C) + P(C) + 2 P(C) + 16 P(C) + 4 P(C) + \frac{3}{5} P(C)$$

$$1 = \left(26 + \frac{9}{5}\right) P(C)$$

$$1 = \frac{139}{5} P(C)$$

$$\hookrightarrow P(C) = \frac{5}{139}$$

$$\rightarrow P(A) = 3 \cdot \frac{5}{139} = \frac{15}{139}$$

$$P(B) = \frac{6}{5} \cdot \frac{5}{139} = \frac{6}{139}$$