4.99 Exercices complémentaires – corrigé.

1/ $P(A) = 4 \cdot P(B)$

$P(B) = P(B)$

$P(C) = 3 \cdot P(A) = 3 \cdot 4\, P(B) = 12\, P(B)$

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

$1 = 4\, P(B) + P(B) + 12\, P(B)$

$1 = 17\, P(B)$

$\hookrightarrow P(B) = \frac{1}{17}$

Réponse : $\rightarrow P(A) = \frac{4}{17}$

$P(B) = \frac{1}{17}$

$P(C) = \frac{12}{17}$

2)

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

$P(B) = P(A) = 2P(C)$

$P(C) = P(C)$

$P(D) = 3 \cdot P(C)$

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

$1 = 2P(C) + 2P(C) + P(C) + 3P(C)$

$1 = 8P(C)$

$\hookrightarrow P(C) = \frac{1}{8}$

$\rightarrow P(A) = \frac{2}{8} = \frac{1}{4}$

$P(B) = \frac{2}{8} = \frac{1}{4}$

$P(C) = \frac{1}{8}$

$P(D) = \frac{3}{8}$

Réponse : $\rightarrow P(A^c) = 1 - P(A)$

$= 1 - \frac{1}{4}$

$= \frac{3}{4}$

3) $P(A) = 2 \cdot P(C)$

$P(B) = \frac{1}{5} \cdot P(A) = \frac{1}{5} \cdot 2\,P(C) = \frac{2}{5}\,P(C)$

$P(C) = P(C)$

$P(D) = \frac{1}{6} P(A) = \frac{1}{6} \cdot 2\,P(C) = \frac{1}{3}\,P(C)$

$P(E) = 3\,P(F) = 3 \cdot 5\,P(C) = 15\,P(C)$

$P(F) = 5 \cdot P(C)$

$P(G) = \frac{3}{5} \cdot P(B) = \frac{3}{5} \cdot \frac{2}{5}\,P(C) = \frac{6}{25}\,P(C)$

$P(\Omega) = 1 = P(A) + P(B) + P(C) + P(D) + P(E) + P(F) + P(G)$

$= 2\,P(C) + \frac{2}{5}\,P(C) + P(C) + \frac{1}{3}\,P(C) + 15\,P(C) + 5\,P(C) + \frac{6}{25}\,P(C)$

$= \left(23 + \frac{1}{3} + \frac{2}{5} + \frac{6}{25}\right) P(C)$

$= \left(\frac{23 \cdot 75}{75} + \frac{1 \cdot 25}{3 \cdot 25} + \frac{2 \cdot 15}{5 \cdot 15} + \frac{6 \cdot 3}{25 \cdot 3}\right) P(C)$

$= \left(\frac{1725}{75} + \frac{25}{75} + \frac{30}{75} + \frac{18}{75}\right) P(C)$

$= \frac{1798}{75}\,P(C)$

$\hookrightarrow P(C) = \frac{75}{1798}$

Réponse : les filles portant les lettres D; E; F et G.

$\rightarrow P(D) = \frac{1}{3} \cdot \frac{25}{1798} = \frac{25}{1798}$

$P(E) = 15 \cdot \frac{75}{1798} = \frac{1125}{1798}$

$P(F) = 5 \cdot \frac{75}{1798} = \frac{375}{1798}$

$P(G) = \frac{3}{25} \cdot \frac{3}{899} = \frac{9}{899}$