Corrigé de l'exercice 1

On utilise les relations :

$P(A \cap B) = P(A)\,P(B \mid A), \qquad P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A})$

et

$P(B) = P(A \cap B) + P(\overline{A} \cap B), \qquad P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}.$

Redaction attendue.

- On calcule $P(A \cap B) = P(A)P(B \mid A)$ et $P(\overline{A} \cap B) = P(\overline{A})P(B \mid \overline{A})$.
- On en deduit $P(B) = P(A \cap B) + P(\overline{A} \cap B)$.
- Comme $P(B) \neq 0$, on calcule $P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}$.
- On donne une valeur approchee au millieme.

$$
\begin{aligned}
P(\overline{A}) = 1 - P(A) = 1 - \frac{1}{10} &= \frac{9}{10} \\
P(A \cap B) = P(A)\,P(B \mid A) = \frac{1}{10} \times \frac{9}{10} &= \frac{9}{100} \\
P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A}) = \frac{9}{10} \times \frac{3}{100} &= \frac{27}{1000} \\
P(B) = P(A \cap B) + P(\overline{A} \cap B) = \frac{9}{100} + \frac{27}{1000} &= \frac{117}{1000} \\
P(B) &\approx 0.117 \\
P(A \mid B) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{9}{100}}{\frac{117}{1000}} &= \frac{10}{13} \\
P(A \mid B) &\approx 0.769
\end{aligned}
$$

Interpretation : Ceci represente la probabilite que l'eleve connaisse la reponse sachant qu'il a repondu juste.

Corrigé de l'exercice 2

On utilise les relations :

$P(A \cap B) = P(A)\,P(B \mid A), \qquad P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A})$

et

$P(B) = P(A \cap B) + P(\overline{A} \cap B), \qquad P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}.$

Redaction attendue.

- On calcule $P(A \cap B) = P(A)P(B \mid A)$ et $P(\overline{A} \cap B) = P(\overline{A})P(B \mid \overline{A})$.
- On en deduit $P(B) = P(A \cap B) + P(\overline{A} \cap B)$.
- Comme $P(B) \neq 0$, on calcule $P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}$.
- On donne une valeur approchee au millieme.

$$P(\overline{A}) = 1 - P(A) = 1 - \frac{1}{4} = \frac{3}{4}$$
$$P(A \cap B) = P(A)\,P(B \mid A) = \frac{1}{4} \times \frac{4}{5} = \frac{1}{5}$$
$$P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A}) = \frac{3}{4} \times \frac{1}{20} = \frac{3}{80}$$
$$P(B) = P(A \cap B) + P(\overline{A} \cap B) = \frac{1}{5} + \frac{3}{80} = \frac{19}{80}$$
$$P(B) \approx 0.237$$
$$P(A \mid B) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{1}{5}}{\frac{19}{80}} = \frac{16}{19}$$
$$P(A \mid B) \approx 0.842$$

Interpretation : Ceci represente la probabilite que l'eleve connaisse la reponse sachant qu'il a repondu juste.

Corrigé de l'exercice 3

On utilise les relations :

$P(A \cap B) = P(A)\,P(B \mid A), \qquad P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A})$

et

$P(B) = P(A \cap B) + P(\overline{A} \cap B), \qquad P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}.$

Redaction attendue.

- On applique la formule des probabilites totales : $P(B) = P(A)P(B \mid A) + P(\overline{A})P(B \mid \overline{A})$.
- On calcule ensuite $P(A \cap B) = P(A)P(B \mid A)$.
- Comme $P(B) \neq 0$, on calcule $P(A \mid B) = \dfrac{P(A \cap B)}{P(B)}$.
- On donne une valeur approchee et on interprete le resultat dans le contexte.

$$P(\overline{A}) = 1 - P(A) = 1 - \frac{3}{20} = \frac{17}{20}$$
$$P(A \cap B) = P(A)\,P(B \mid A) = \frac{3}{20} \times \frac{4}{5} = \frac{3}{25}$$
$$P(\overline{A} \cap B) = P(\overline{A})\,P(B \mid \overline{A}) = \frac{17}{20} \times \frac{2}{25} = \frac{17}{250}$$
$$P(B) = P(A \cap B) + P(\overline{A} \cap B) = \frac{3}{25} + \frac{17}{250} = \frac{47}{250}$$
$$P(B) \approx 0.188$$
$$P(A \mid B) = \frac{P(A \cap B)}{P(B)} = \frac{\frac{3}{25}}{\frac{47}{250}} = \frac{30}{47}$$
$$P(A \mid B) \approx 0.638$$

Interpretation : Ceci represente la probabilite que l'eleve connaisse la reponse sachant qu'il a repondu juste.