

CORRIGE

EXERCICE 1 (05 points)

- 1) $P(H \cap n) = 0,4$ s, $p(m) = p(H \cap m) + p(F \cap n) = 0,40 + 0,10 = 0,50$
 2) $P(H/n) = \frac{p(H \cap n)}{p(n)} = \frac{0,40}{0,50} = 0,8$.

EXERCICE 2 (06 points)

- 1) $\ln(2x - 1) - \ln(x^2 - 1) = 0$
 De : $2x - 1 > 0 \Rightarrow x > 1$
 $x^2 - 1 > 0$
 $\ln(2x - 1) = \ln(x^2 - 1) \Rightarrow 2x - 1 = x^2 - 1 \Rightarrow x^2 - 2x = 0$
 $x = 0, x = 2$
 $S = \{2\}$
- 2) $2(\ln x)^3 - (\ln x)^2 - 2\ln x + 1 = 0$
 $x > 0$ posons $y = \ln x \Rightarrow 2y^3 - y^2 - 2y + 1 = 0$
 $(y - 1)(2y^2 + y - 1) = 0$
 $(y - 1)(y + 1)(2y - 1) = 0 \Rightarrow y = 1$
 $y = -1$
 $y = 1/2$

or $y = \ln x \Rightarrow x = e, x = e^{-1}, x = e^{1/2}$
 $S = \{e^{-1}, e^{1/2}, e\}$

- 3) $2e^{3x} - e^{2x} - 2e^x + 1 > 0$
 Posons $y = e^x \Rightarrow 2y^3 - y^2 - 2y + 1 > 0$
 $(y - 1)(y + 1)(2y - 1) > 0 \quad e^x = 1 \Rightarrow x = 0$
 $(e^x - 1)(e^x + 1)(2e^x - 1) > 0 \quad e^x = -1$
 $e^x = 1/2 \Rightarrow x = -\ln 2$

| | | | | |
|------------|-----------|----------|---|-----------|
| x | $-\infty$ | $-\ln 2$ | 0 | $+\infty$ |
| $e^x - 1$ | - | - | 0 | + |
| $e^x + 1$ | + | + | + | + |
| $2e^x - 1$ | - | 0 | + | + |
| p | + | 0 | 0 | + |

EXERCICE 3 (04 points)

- 1) $\det(A) = 2$
- 2) La matrice des cofacteurs $A^* = \begin{pmatrix} 2 & -2 & -2 \\ 0 & 1 & 1 \\ 0 & -1 & 1 \end{pmatrix}$
 Donc $A^{-1} = \frac{1}{\det(A)} \times t_{A^*} = \frac{1}{2} \begin{pmatrix} 2 & 0 & 0 \\ -2 & 1 & -1 \\ -2 & 1 & 1 \end{pmatrix}$

EXERCICE 4 (05 points)

Soit C le capital

$$\begin{cases} C + \frac{C \times n \times 9}{100} = 17\,400 \\ \frac{C \times (n-1) \times 10}{100} = 4800 \end{cases} \quad \begin{cases} C = \frac{1\,740\,000}{100+9n} \\ \frac{17\,400(n-1)}{100+9n} = 480 \end{cases}$$

$17\,400(n-1) = 480(100+9n)$
 $N = 5$ et $C = 12\,000$