QCM - La Totale

1) $2x - x^2 + 3 = 0 \Leftrightarrow -x^2 + 2x + 3 = 0$ c
$\Delta = 4 - 4 \times (-1) \times 3 = 4 + 12 = 16$

2) $f(x) = -3x^2 + 6x - 1 = -3(x-1)^2 + 2$ c

3) $f(0) = 4$ c

4) $f'(4) = \frac{2}{4} = \frac{1}{2} = 0{,}5$ c

$f(x) = x^3 - 3x^2 - 9x + 3$ sur $[-3;4]$

5) sur $[3;4]$ $f'(x) > 0$ f croissante a

6) $f(-2) = -8 - 3 \times 4 + 18 + 3 = 1$ c

7) $f(x) = 0$ admet 2 solutions sur $[-3;4]$ c

8) $\cos\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2}$ b

9) $\sin(\alpha) = 1/2$ alors $\sin(\pi - \alpha) = \frac{1}{2}$ a

10) $\sin(\alpha) = 1/2$ avec $\alpha \in [\frac{\pi}{2}; \pi]$ $\cos(\alpha) < 0$
$\cos^2(\alpha) = 1 - \sin^2(\alpha) = \frac{3}{4}$ donc $\cos(\alpha) = -\frac{\sqrt{3}}{2}$ c

11) $e^x - e^{-x} = e^x - \frac{1}{e^x} = \frac{e^{2x} - 1}{e^x}$ b

12) $f(t) = (2t+4)e^{-2t}$ b
$f'(t) = 2e^{-2t} + (2t+4) \times (-2)e^{-2t} = e^{-2t}(2 - 4t - 8) = e^{-2t}(-4t - 6)$

13) $e^{-2x+4} \leq 1 \Leftrightarrow -2x + 4 \leq 0 \Leftrightarrow -2x \leq -4 \Leftrightarrow x \geq 2$ a

14) $g(x) = xe^x$
$g'(x) = e^x + xe^x = (1+x)e^x$
$y = g'(1) \times (x-1) + g(1)$
$y = 2e(x-1) + e$
$y = 2ex - e$ a

15) $A(2;5)$ $B(11;1)$ $C(6;-4)$
$\vec{AB}\begin{pmatrix} 9 \\ -4 \end{pmatrix}$ $\vec{AC}\begin{pmatrix} 4 \\ -9 \end{pmatrix}$ $\vec{BC}\begin{pmatrix} -5 \\ -5 \end{pmatrix}$
$AB^2 = AC^2 \Leftrightarrow AB = AC$
$\vec{AB} \cdot \vec{AC} = 36 + 36 = 72 \ (\neq 0)$
ABC est isocèle en A non rectangle
c

16) $\overrightarrow{AB}\cdot\overrightarrow{AC} = AB\times AC\times\cos(\widehat{BAC})$ $\quad AB^2 = 81+16 = 97$

$\Leftrightarrow 72 = 97\cos(\widehat{BAC})$

$\Leftrightarrow \cos(\widehat{BAC}) = \dfrac{72}{97}$ (a)

17) $\mathcal{D} : 3x+2y-4=0$ $\quad \vec{n}\begin{pmatrix}3\\2\end{pmatrix}$ $\quad \vec{n}'\begin{pmatrix}-4\\6\end{pmatrix}$ (b)

$\mathcal{D}' : -4x+6y+1=0$ $\quad \vec{n}\cdot\vec{n}'=0$ $\quad \mathcal{D}\perp\mathcal{D}'$

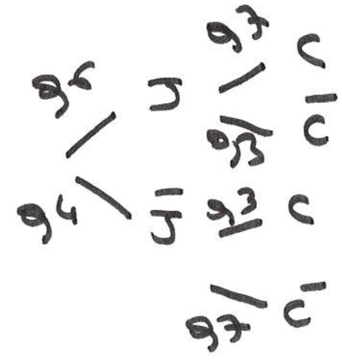
18) $y = 3x+1$ vecteur directeur $\vec{d}\begin{pmatrix}1\\3\end{pmatrix}$

vecteur normal $\vec{u}\begin{pmatrix}-3\\1\end{pmatrix}$ (b)

19) $\vec{u}\begin{pmatrix}1/2\\-8\end{pmatrix}$ $\vec{v}\begin{pmatrix}4\\-1/4\end{pmatrix}$ non colinéaires

$\vec{u}\cdot\vec{v} = \frac{1}{2}\times 4 - 8\times\left(\frac{-1}{4}\right) = 4\ (\neq 0)$

non orthogonaux (c)

20) 

$P_C(J) = \dfrac{P(C\cap J)}{P(C)} = \dfrac{0{,}42}{0{,}56} = \dfrac{42}{56} = \dfrac{6}{8} = \dfrac{3}{4}$

$P(C) = P(J\cap C) + P(\bar{J}\cap C)$ (b)

$= 0{,}6\times 0{,}7 + 0{,}4\times 0{,}3$

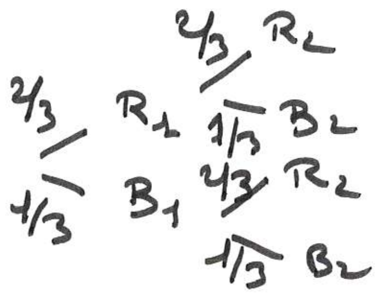
$= 0{,}42 + 0{,}12$

$= 0{,}56$

21) $P\times F$ ou $F\times P$

$\frac{1}{2}\times\frac{1}{2}+\frac{1}{2}\times\frac{1}{2} = 2\times\frac{1}{4} = \frac{1}{2}$ (a)

22) 2R 1B Avec Remise



$P(R_1) = \dfrac{2}{3}$ $\quad P_{R_1}(R_2) = \dfrac{2}{3} = P(R_2)$ (a)

$P(R_1\cap R_2) = \dfrac{2}{3}\times\dfrac{2}{3} = \dfrac{4}{9}$

R_1 et R_2 sont indépendants

23) $\begin{cases} u_0 = 2 \\ u_{n+1} = 3u_n \quad (n\in\mathbb{N}) \end{cases}$ suite géo de raison $q=3$

$u_n = 2\times 3^n$ (c)

24) $1+3+3^2+\cdots+3^{10} = \dfrac{1-3^{11}}{1-3} = \dfrac{1-3^{11}}{-2} = \dfrac{1}{2}(3^{11}-1)$ (c)

$= 88\ 573$