Corrigé Baccalauréat 2022 Session Normale

Exercice 01

Question	01	02	03	04	05	06
Reponse	C	B	A	B	C	A

Exercice 2

1-a/ $(4-2i)^2 = 4^2 - 2\times4\times2i + (2i)^2 = 16-16i-4$
$(4-2i)^2 = 12-16i$

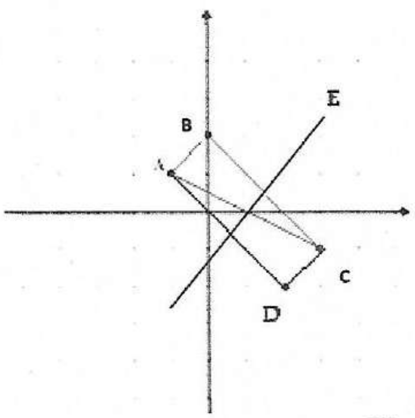
1-b/ $P(2i) = (2i)^3 - (2+2i)(2i)^2 - (2-8i)(2i) + 8+4i$
$= -8i-(2+2i)(-4)-4i-16+8+4i$
$-8i+8+8i-4i-16+8+4i=0$

T.H

	1	2-2i	-2+8i	8+4i
2i		2i	-4i	-8-4i
	1	-2	-2+4i	0

a=-2; b=-2+4i
P(Z)= (Z-2i)(Z2-2Z-2+4i) *Z-2i = 0 ou Z2-2Z-2+4i = 0*
Z=2i $\Delta = (-2)2 -4(-2+4i) = 4+8-16i = 12-16i$
$\Delta = 12-16i = (4-2i)^2$ $\sqrt{\Delta} = 4-2i$
$Z_1 = \frac{2+4-2i}{2} = 3-i$ $Z_2 = \frac{2-4+2i}{2} = -1+i$

2-a/
Placer les points



b/
ABCD soit Parallélogramme AB=DC $Z_B - Z_A = Z_C - Z_D$
$Z_D = Z_C + Z_A - Z_B = 3-i-1+i-2i$

C/ Forme exponentielle

$Z_A = -1+i$ $|Z_A| = \sqrt{(-1)^2+1^2)}^2 = \sqrt{2}$ $\begin{cases} cos\theta = -\frac{1}{\sqrt{2}} \\ sins\theta = \frac{1}{\sqrt{2}} \end{cases}$ $\theta = \pi - \frac{\pi}{4} = \frac{3\pi}{4}$

F.E: $Z_A = \sqrt{2}\ e^{\frac{3\pi}{4}i}$

$Z_B = 2i$ $|Z_B| = 2$
$\begin{cases} cos\theta = -\frac{0}{2} = 0 \\ sins\theta = \frac{2}{2} = 1 \end{cases}$ $\theta = \frac{\pi}{2}$ F.E: $Z_B = 2\ e^{\frac{\pi}{2}i}$

d/ $\frac{Z_C-2i}{Z_A-2i} = \frac{3-i-2i}{-1+i-2i} = \frac{3-3i}{-1-i} = \frac{3-3i}{-1-i} \times \frac{-1+i}{-1+i} = \frac{-3+3i+3i+3}{1-i+i+1} = \frac{6i}{2} = 3i$

$\frac{Z_C-2i}{Z_A-2i} = |3i| = 3$

F.T : $3(\cos\frac{\pi}{2} + i\sin s\frac{\pi}{2})$
Triangle rectangle en B
3/a/ $|Z-3+i| = |Z+1-i|$
$|Z-(3-i)| = |Z-(-1+i)|$
$|Z_M - Z_C| = |Z+1-i|$ *CM=AM*

E: est médiatrice du Segment [CA]

b/ $arg(Z-3+i) - arg(Z+1-i) = \frac{\pi}{2}$

$arg(\frac{Z-3+i}{Z+1-i}) = \frac{\pi}{2} \Longrightarrow arg(\frac{Z-(3-i)}{Z-(-1+i)}) = \frac{\pi}{2} \Longrightarrow Arg(\frac{Z_M-Z_C}{Z_M-Z_A}) = \frac{\pi}{2}$

$arg(\frac{CM}{AM}) = \frac{\pi}{2} \Longrightarrow (\overrightarrow{AM}; \overrightarrow{CM}) = \frac{\pi}{2}$

F: Cercle de diamètre AC prive de A et C .

Exercice 03

1/ $U_0 = 0$, $U_{n+1} = U_n + e^{-n}$

Pour n=o ; $U_{0+1} = U_0 + e^0 = 0+1 \Longrightarrow$ $\boxed{U_1 = 1}$

Pour n =1 ; $U_{1+1} = U_1 + e^{-1} \Longrightarrow$ $\boxed{U_2 = 1 + e^{-1}}$

Pour n = 2 ; $U_{2+1} = U_2 + e^{-2} \Longrightarrow$ $\boxed{U_3 = 1 + e^{-1} + e^{-2}}$

2/ $V_n = U_{n+1} - U_n$

$= U_n + e^{-n} - Un \Longrightarrow Vn = e^{-n} \Longrightarrow V_{n+1} = e^{-n-1}$

$\frac{V_{n+1}}{Vn} = \frac{\frac{1}{e^{n+1}}}{\frac{1}{e^n}} = \frac{1}{e} = e^{-1}$ *Vn est une suite geometrique de raison* $q = \frac{1}{e}$

1er terme $V_0 = U_{0+1} - U_0$ $V_0 = 1$

b/ $V_n = V_0 q^n = 1\times(e^{-1})^n$; $Vn = e^{-n}$

C/ $S_n = V_0 + V_1 + V_2 + \dots\dots + V_{n-1}$

$V_0 = \cancel{U_1} - V_0$

$V_1 = \cancel{U_2} - \cancel{V_1}$

$V_2 = \cancel{U_3} - \cancel{V_2}$

.. $\cancel{..}$ $\cancel{....}$

$V_{n-1} = U_n - \cancel{V_{n-1}}$

$Sn = Un - U_0 = Un$

$S_n = \frac{1}{1-e^{-1}}(1-(e^{-1})^n) = \frac{1-e^{-n}}{1-e^{-1}}$

$\lim_{n\to+\infty} \frac{1}{1-e^{-1}}$

Exercice 04

$Y''+2y'+y=0$

$r^2+2r+1=0$; $\Delta=(2)^2-4\times1\times1$

$\Delta=4-4=0$ $r=\frac{-2}{2}=-1$

$h(x)=(Ax+B)e^{-x}$

2. $\begin{cases}h(0)=-1\\h(-1)=0\end{cases}$ $\begin{cases}h(0)=(A\times0+B)e^{0}=-1\\h(-1)=(-1A+B)e^{1}=0\end{cases}$

$\begin{cases}B=-1\\-A+B=0\end{cases}$ $\begin{cases}B=-1\\B=A=-1\end{cases}$

$h(x)=(-x-1)e^{-x}$

II.

$F(x)=-(x+1)e^{-x}-1$

$\lim\limits_{x\to-\infty}F(x)-(-\infty)e^{-(-\infty)}-1$

$=+\infty\times+\infty=+\infty$

$\boxed{P(2i)=0}$

$.\lim\limits_{x\to-\infty}\frac{f(x)}{x}=-(\frac{x+1}{x})e^{-x}=-(\frac{x}{x}+\frac{1}{x})e^{-x}$

$.=-(1+\frac{1}{x})e^{-x}=-e^{-x}=-(+\infty)=-\infty$

$.\lim\limits_{x\to-\infty}\frac{f(x)}{x}=-\infty$

Interprétation : la courbe admet une branche parabolique de direction (oy)

$\Longrightarrow$

b/ $\lim\limits_{x\to+\infty}F(x)=-(X+1)e^{-x}-1$

$=-(-\infty\times0$: F.I

$=-Xe^{-x}-e^{-x}-1$

$=0-0-1=-1$; $Y=-1$ Asymptote horizontal

*La position relative

$F(x)-y==-(X+1)e^{-x}-1-(-1)$

$=-(X+1)e^{-x}=0$

$=-(X+1)=0;\ e^{-x}>0$

$X=-1$

x	$-\infty$	-1	$+\infty$
F(x)-y	$-$	0	$+$
P.R	C/Δ	-1	Δ/C

2-a/ $F(x)=-(x+1)e^{-x}-1$

$F'(x)=-e^{-x}-(x+1)e^{-x}=(-1+x+1)e^{-x}$

$=xe^{-x}$

Le signe f'(x) x	$-\infty$	-1	$+\infty$
F'	$-$		$+$

b/ tableau de variation

x	$-\infty$	-1	$+\infty$
F'(x)	$-$	0	$+$
F(x)	-1	-2	$+\infty$

3-a/ D'âpres le TV F est continue et change le signe une seul fois donc il existe un réel $\propto$ $tel\ que\ f(\propto)=0$

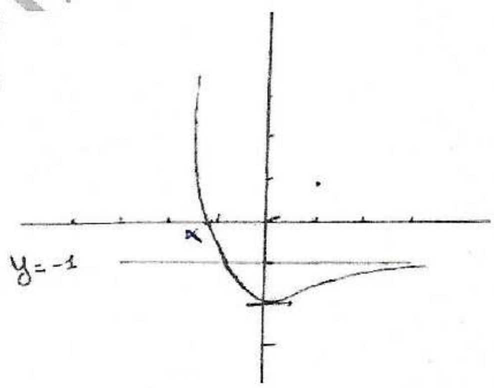
F (-1.3) x F (-1,2) < 0 $-1{,}3<\propto<-1{,}2$; $f(\propto)=0$

b/ $F'(x)=xe^{-x}$

Point d'inflexion :

$F''(x)=e^{-x}-xe^{-x}=.(1-x)e^{-x}=0$; $1-x=0$; $e^{-x}>0$

$x=1$; $F(1)=-2e^{-1}-1$; $A(1;\ -2e^{-1}-1)$



Exercice 05

$F(x)=x^2(2\ln x-1)+1$

$\lim\limits_{x\to0^+}F(x)=0^2(2(-\infty)-1)+1:f.I$

$.\lim\limits_{x\to0^+}F(x)=2x^2\ln x-x^2+1$

$=0-0+1=1$

$..\lim\limits_{x\to0^+}F(x)=1$

interpretation ;prolongement par continute

$.\lim\limits_{x\to+\infty}F(x)=(+\infty)^2(2(+\infty)-1)=+\infty$

$.\lim\limits_{x\to+\infty}\frac{f(x)}{x}=\frac{x^2(2\ln x-1)+1}{x}=x(2\ln x-1)+\frac{1}{x}$

$=(+\infty)(+\infty)+0=+\infty$

interpretation grapihque

$\lim\limits_{n\to\infty}\frac{f(x)}{x}=+\infty$

: *Cf admet un B.P de direction (oy)*

2-a/ F(x) $= x^2(2lnx - 1) + 1$.

F '(x) $= 2x(2lnx - 1) + \frac{2x^2}{x}$

$= 4xlnx - 2x + 2x$

$F'(x) = 4xlnx$

b/ T.V

x	0	1	$+\infty$
F'(x)		$-$	$+$
F(x)	1	0	$+\infty$

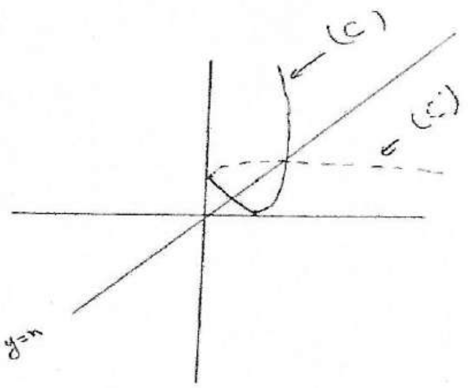
3- a / G est continue est strictement croissante de $[1\,;+\infty[$ *vers* $[0\,;+\infty$ *donc g realise une* ***bijection de*** $[1;+\infty[$ ***vers*** $[0;+\infty[$

$I : [1;+\infty[$ ***Et*** $J :\ [0;+\infty[$

TV de g^{-1}

x	0	$+\infty$
F'(x)	$+$	
F(x)	1	$+\infty$

4 /



$K = \int_1^e x^2 lnx\,dx$

$$\begin{cases} U(x) = lnx & U'(x) = \frac{1}{x} \\ V'(x) = x^2 & V(x) = \frac{x^3}{3} \end{cases}$$

$K = [\frac{x^3}{3} lnx]_1^e - \int_1^e \frac{x^3}{3} \times \frac{1}{x} dx$

$K = [\frac{x^3}{3} lnx]_1^e - \frac{1}{3}\int_1^e x^2 dx$

$= [\frac{x^3}{3} lnx - \frac{x^3}{9}]_1^e K = [\frac{x^3}{3} lnx]_1^e - \frac{1}{3}[\frac{x^3}{3}]_1^e$

$= \frac{e^3}{3} - \frac{e^3}{9} - \left(-\frac{1}{9}\right) = \quad K = \frac{2e^3+1}{9}\ u.a$

5/ $\int_1^e f(x)\,dx = \int_1^e (x^2(2lnx - 1) + 1)\,dx$

$$A = \int_1^e (2x^2 lnx - x^2 + 1)\,dx$$

$= \int_1^2 2\,x^2 lnx dx - \int_1^e x^2 dx + \int_1^e 1 dx$

$= 2[\frac{x^3}{3} lnx - \frac{x^3}{9}]_1^e - [\frac{x^3}{3}]_1^e + [x]_1^e$

$$= \frac{4e^3+2}{9} - \frac{e^3}{3} + \frac{1}{3} + e - 1 = \frac{e^3 - 4 + 9e}{9}$$

Justification Exercice 1

R_1: P(G) $= \frac{580}{1000} = 0.58$

R_2: $P(\overline{S}) = 1 - \frac{600}{1000} = 0.4$

R_3: PG (S) $= \frac{P(G\cap S)}{P(G)} = \frac{0.34}{0.58} = \frac{17}{29}$

R_4: P(G∪S)= P(G)+P(S)-P(GAS) = 0.58 + 0.6 - 0.34 = 0.84

R_5: $f(\lambda) = \lambda e^{\lambda} = 0,1e^{-0,1}$;f(λ)=1 - $e^{-\lambda t}$
T ≤ 30 ; f(30)=1- $e^{-0,1\times 30}$ =1-e^{-3}

R_6: $P_{T>10}$ (T≥30)= $P_{T>10}$ (T≥10+20)
P(T≥30) = $e^{-0.1X20}$=e^{-2}

مع تمنياتي لكم بالنجاح والتفوق