Université Mohamed Boudiaf M'sila (2021/2022)
Institut de Gestion des Techniques Urbaines
Département Socle de commun

Le 29/05/2022

Mathématiques 02

Corriger l'épreuve du 2^{eme} Semestre

Qst01(06pt)

1- $\dfrac{3+6i}{3-4i}=-\dfrac{3}{5}+\dfrac{6}{5}i.$

2- $(1+i)^2=2i.$

3- $(1+i)=\sqrt{2}\left(\cos\dfrac{\pi}{4}+i\sin\dfrac{\pi}{4}\right)=\sqrt{2}e^{i\frac{\pi}{4}}.$

4- $1+i\sqrt{3}=2\left(\cos\dfrac{\pi}{3}+i\sin\dfrac{\pi}{3}\right)=2e^{i\frac{\pi}{3}}.$

Qst02(06pt)

1. $\displaystyle\int\frac{1}{x\ln x}dx=\int\frac{1}{\ln x}\frac{dx}{x}=\int\frac{1}{u}du=\ln|u|+c=\ln|\ln x|+c.$
2. $\displaystyle\int xe^x dx=xe^x-\int e^x dx=(x-1)e^x+\mathrm{c}.$
3. $\displaystyle\int_{-2}^{2}|x|=\int_{-2}^{0}-x+\int_{0}^{2}x=\left[-\frac{x^2}{2}\right]_{-2}^{0}+\left[\frac{x^2}{2}\right]_{0}^{2}=2+2=4.$

Qst03(08pt)

1- $|A|=2p+2=0\Rightarrow p=-1.$

2- $A=\begin{pmatrix}1&0&0\\4&6&-1\\3&4&1\end{pmatrix}\Rightarrow A^{-1}=\dfrac{1}{|A|}(adjA)^t=\dfrac{1}{10}\begin{pmatrix}10&0&0\\-7&1&1\\-2&-4&6\end{pmatrix}=\begin{pmatrix}1&0&0\\-\frac{7}{10}&\frac{1}{10}&\frac{1}{10}\\-\frac{1}{5}&-\frac{2}{5}&\frac{3}{5}\end{pmatrix}.$

3- $\begin{cases}x=1\\4x+6y-z=13\\3x+4y+z=14\end{cases}\Rightarrow\begin{pmatrix}1&0&0\\4&6&-1\\3&4&1\end{pmatrix}\begin{pmatrix}x\\y\\z\end{pmatrix}=\begin{pmatrix}1\\13\\14\end{pmatrix}\Rightarrow AX=M$

$$\Rightarrow X=A^{-1}M=\frac{1}{10}\begin{pmatrix}10&0&0\\-7&1&1\\-2&-4&6\end{pmatrix}\begin{pmatrix}1\\13\\14\end{pmatrix}=\frac{1}{10}\begin{pmatrix}10\\20\\30\end{pmatrix}\Rightarrow\begin{cases}x=1\\y=2.\\z=3\end{cases}$$

Responsable de module :