

Ost01(06pt)

- 1- $\frac{3+6i}{3-4i} = -\frac{3}{5} + \frac{6}{5}i.$
- 2- $(1+i)^2 = 2i.$
- 3- $(1+i) = \sqrt{2} \left(\cos \frac{\pi}{4} + i \sin \frac{\pi}{4} \right) = \sqrt{2} e^{i\frac{\pi}{4}}.$
- 4- $1+i\sqrt{3} = 2 \left(\cos \frac{\pi}{3} + i \sin \frac{\pi}{3} \right) = 2e^{i\frac{\pi}{3}}.$

Ost02(06pt)

1. $\int \frac{1}{x \ln x} dx = \int \frac{1}{\ln x} \frac{dx}{x} = \int \frac{1}{u} du = \ln|u| + c = \ln|\ln x| + c.$
2. $\int (x-1)e^x dx = (x-1)e^x - \int e^x dx = (x-2)e^x + c.$
3. $\int_1^2 \frac{1}{x^2} dx = \left[-\frac{1}{x} \right]_1^2 = -\frac{1}{2} + 1 = \frac{1}{2}.$

Ost03(08pt)

- 1- $A+B = \begin{pmatrix} 2 & 0 & 0 \\ p+2 & p+5 & -2 \\ p-3 & p+4 & 2 \end{pmatrix}, B^T = \begin{pmatrix} 1 & 2 & -2 \\ 0 & 3 & 4 \\ 0 & -1 & 1 \end{pmatrix}, B^2 = \begin{pmatrix} 1 & 0 & 0 \\ 10 & 5 & -4 \\ 4 & 16 & -3 \end{pmatrix}.$
- 2- $|A| = 2p+2=0 \Rightarrow p=-1.$
- 3- $A = \begin{pmatrix} 1 & 0 & 0 \\ 4 & 6 & -1 \\ 3 & 4 & 1 \end{pmatrix} \Rightarrow A^{-1} = \frac{1}{|A|} (\text{adj}A)^T = \frac{1}{10} \begin{pmatrix} 10 & 0 & 0 \\ -7 & 1 & 1 \\ -2 & -4 & 6 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ -\frac{7}{10} & \frac{1}{10} & \frac{1}{10} \\ -\frac{2}{5} & -\frac{2}{5} & \frac{3}{5} \end{pmatrix}.$
- 4- $\begin{cases} x=1 \\ 4x+6y-z=13 \\ 3x+4y+z=14 \end{cases} \Rightarrow \begin{pmatrix} 1 & 0 & 0 \\ 4 & 6 & -1 \\ 3 & 4 & 1 \end{pmatrix} \begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 1 \\ 13 \\ 14 \end{pmatrix} \Rightarrow AX = M$
 $\Rightarrow X = A^{-1}M = \frac{1}{10} \begin{pmatrix} 10 & 0 & 0 \\ -7 & 1 & 1 \\ -2 & -4 & 6 \end{pmatrix} \begin{pmatrix} 1 \\ 13 \\ 14 \end{pmatrix} = \frac{1}{10} \begin{pmatrix} 10 \\ 20 \\ 30 \end{pmatrix} \Rightarrow \begin{cases} x=1 \\ y=2 \\ z=3 \end{cases}$

Responsable de module :