Problems for exercise – numerical methods for matrix inversion

Inverse the matrices given below and at the same time calculate their determinants using the Gauss-Jordan method:

1) $A=\begin{pmatrix} 1 & 2 & 3 \\ -2 & -4 & -5 \\ 3 & 5 & 6 \end{pmatrix}$, Answer: $A^{-1}=\begin{pmatrix} 1 & 3 & 2 \\ -3 & -3 & -1 \\ 2 & 1 & 0 \end{pmatrix}$

2) $B=\begin{pmatrix} 1 & 3 & 2 \\ -3 & -3 & -1 \\ 2 & 1 & 0 \end{pmatrix}$, Answer: $B^{-1}=\begin{pmatrix} 1 & 2 & 3 \\ -2 & -4 & -5 \\ 3 & 5 & 6 \end{pmatrix}$

3) $C=\begin{pmatrix} 1 & i & 3 \\ -i & 1 & i \\ 0 & -i & 1 \end{pmatrix}$, Answer: $C^{-1}=\begin{pmatrix} 0 & i & 1 \\ \frac{1}{4}i & -\frac{1}{4} & i \\ \frac{1}{4} & -\frac{1}{4}i & 0 \end{pmatrix}$

4) $A=\begin{pmatrix} 14 & -5 & 12 \\ 9 & -2 & 7 \\ 17 & -5 & 14 \end{pmatrix}$, Answer: $A^{-1}=\begin{pmatrix} 7 & 10 & -11 \\ -7 & -8 & 10 \\ -11 & -15 & 17 \end{pmatrix}$

5) $A=\begin{pmatrix} 3 & 2 & -4 & 3 \\ -1 & 0 & -1 & 0 \\ 1 & 3 & 1 & 2 \\ -2 & 1 & -2 & 1 \end{pmatrix}$, Answer: $A^{-1}=\begin{pmatrix} \frac{1}{7} & 1 & \frac{1}{7} & -\frac{5}{7} \\ 0 & 5 & 1 & -2 \\ -\frac{1}{7} & -2 & -\frac{1}{7} & \frac{5}{7} \\ 0 & -7 & -1 & 3 \end{pmatrix}$

6) $A=\begin{pmatrix} 1 & 4 & 3 \\ 2 & 1 & 0 \\ 3 & -1 & 1 \end{pmatrix}$, Answer: $A^{-1}=\begin{pmatrix} -\frac{1}{22} & \frac{7}{22} & \frac{3}{22} \\ \frac{1}{11} & \frac{4}{11} & -\frac{3}{11} \\ \frac{5}{22} & -\frac{13}{22} & \frac{7}{22} \end{pmatrix}$

7) $A=\begin{pmatrix} 1 & 1 & 3 & 4 \\ -1 & 0 & 3 & -2 \\ 2 & 1 & 2 & -3 \\ 1 & 2 & -1 & 1 \end{pmatrix}$, Answer: $A^{-1}=\begin{pmatrix} 0{,}11 & -0{,}42 & 0{,}35 & -0{,}23 \\ -0{,}06 & 0{,}32 & -0{,}10 & 0{,}58 \\ 0{,}13 & 0{,}14 & 0{,}05 & -0{,}09 \\ 0{,}14 & -0{,}08 & -0{,}10 & -0{,}02 \end{pmatrix}$

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