Tutorial 2 Solution

1. (i) $\begin{bmatrix} 1 & 2 & -3 & 0 \\ 0 & 0 & 4 & 2 \\ 0 & 0 & 0 & 1/2 \end{bmatrix}$ (ii) $\begin{bmatrix} 3 & 2 & -1 \\ 0 & -13/3 & -13/3 \\ 0 & 0 & 0 \end{bmatrix}$

(iii) $\begin{bmatrix} 1 & -2 & 0 & 4 \\ 0 & 7 & 1 & -12 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$

2. (i) $\begin{bmatrix} -7/10 & 1/5 & 3/10 \\ -13/10 & -1/5 & 7/10 \\ 4/5 & 1/5 & -1/5 \end{bmatrix}$ (ii) $\begin{bmatrix} -1 & -1/3 & 1/3 & 1 \\ 1 & 0 & 0 & -1 \\ -1 & 1 & 0 & 0 \\ 1 & 1/3 & -1/3 & 0 \end{bmatrix}$

3. $\left[\begin{array}{cc|c} -4 & 5 & 6 \\ 1 & 8 & 4 \\ \hline -2 & 17 & 14 \end{array}\right]$

4. Linearly independent

5. (i) $Tr(A) = 0$

(ii) $A^2 = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 10 & -18 & -12 & 0 & 0 \\ 0 & 0 & -1 & 3 & -4 & 0 & 0 \\ 0 & 0 & 1 & -2 & 5 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$ (iii) $\det(A) = 8$