

Chapter 1 Section 7

Problem 5

$$\mathbf{MM} = \begin{pmatrix} 0 & -8 & 5 \\ 3 & -7 & 4 \\ -1 & 5 & -4 \\ 1 & -3 & 2 \end{pmatrix};$$

RowReduce[MM]//MatrixForm

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ 0 & 0 & 0 \end{pmatrix}$$

The corresponding set of homogeneous equations has only the trivial solution, so the column vectors are linearly independent.

Problem 8

$$\mathbf{NN} = \begin{pmatrix} 1 & 4 & -3 & 0 \\ -2 & -7 & 5 & 1 \\ -4 & -5 & 7 & 5 \end{pmatrix};$$

RowReduce[NN]//MatrixForm

$$\begin{pmatrix} 1 & 0 & 0 & -3 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & -1 \end{pmatrix}$$

The corresponding set of homogeneous equations does have non-trivial solutions, so these vectors are linearly dependent.