Exercises

1- Let S={(1,2,3),(2,1,4),(-1,-1,2),(0,1,2),(1,1,1)}. Find a basis for the subspace V=span S of R^3 .

2- Let S={$\begin{bmatrix}1\\2\\1\\2\end{bmatrix}$, $\begin{bmatrix}2\\1\\2\\1\end{bmatrix}$, $\begin{bmatrix}3\\2\\3\\2\end{bmatrix}$, $\begin{bmatrix}3\\3\\3\\3\end{bmatrix}$ $\begin{bmatrix}5\\3\\5\\3\end{bmatrix}$}. Find a basis for the subspace V=span S of R^4

3- Find the row and column ranks of

$$A=\begin{bmatrix}1 & 3 & 2 & 0 & 0 & 1\\ 2 & 1 & -5 & 1 & 2 & 0\\ 3 & 2 & 5 & 1 & -2 & 1\\ 5 & 8 & 9 & 1 & -2 & 2\\ 9 & 9 & 4 & 2 & 0 & 2\end{bmatrix}$$

In exercises 4-7 compute the rank of each matrix.

4- $\begin{bmatrix}1 & 2 & 1 & 3\\ 2 & 1 & -4 & -5\\ 7 & 8 & -5 & -1\\ 10 & 14 & -2 & 8\end{bmatrix}$

5- $\begin{bmatrix}1 & 2 & 1 & 3\\ 2 & 1 & -4 & -5\\ 1 & 1 & 0 & 0\\ 0 & 0 & 1 & 1\end{bmatrix}$

6- $\begin{bmatrix}1 & 2 & 3\\ -1 & 2 & 1\\ 3 & 1 & 2\end{bmatrix}$

7- $\begin{bmatrix}1 & -2 & -1\\ 2 & -1 & 3\\ 7 & -8 & 3\end{bmatrix}$

In exercises 8 and 9, use theorem 3.1.7 to determine whether each matrix is singular or nonsingular.

8- $\begin{bmatrix}1 & 2 & -3\\ -1 & 2 & 3\\ 0 & 8 & 0\end{bmatrix}$

9- $\begin{bmatrix}1 & 2 & -3\\ -1 & 2 & 3\\ 0 & 1 & 1\end{bmatrix}$