Quiz 9

1. What is the transition matrix from S_1 to S_2 ,given

$S_1=\left\{\mathbf{u_1}=\begin{bmatrix}1\\-2\end{bmatrix},\mathbf{u_2}=\begin{bmatrix}3\\-4\end{bmatrix}\right\}$,$S_2=\left\{v_1=\begin{bmatrix}1\\3\end{bmatrix},v_2=\begin{bmatrix}3\\8\end{bmatrix}\right\}$

(a) $\begin{bmatrix}-14 & -36\\5 & 13\end{bmatrix}$ (b) $\begin{bmatrix}-13/2 & -18\\3/2 & 7\end{bmatrix}$ (c) $\begin{bmatrix}-7 & -18\\5/2 & 13/2\end{bmatrix}$ (d) $\begin{bmatrix}-13 & -36\\5 & 14\end{bmatrix}$

(a) $S_2^{-1}\ S_1$

2. Given the basis B={(4,0), (0,1)} ,and the standard vector **w**=(2,3),what is the coordinate vector $[\mathbf{w}]_B$?

(a) (8,3) (b) (2,6) (c) (2,3) (d) $(\frac{1}{2}$,3)

(d) B^{-1} w =$[\mathbf{w}]_B$

3. Given A**x**=**o** ,and $\bar{A}$=[A | **o**],

let rref $[\bar{A}]=\begin{bmatrix}1 & 2 & 0 & 0 & 0\\0 & 0 & 1 & 3 & 0\end{bmatrix}$,

the solution space is spanning by

(a) $\begin{bmatrix}1\\2\\0\\0\end{bmatrix}\begin{bmatrix}0\\0\\1\\3\end{bmatrix}$ (b) $\begin{bmatrix}2\\1\\0\\0\end{bmatrix}\begin{bmatrix}0\\-3\\0\\1\end{bmatrix}$ (c) $\begin{bmatrix}-2\\1\\0\\0\end{bmatrix}\begin{bmatrix}0\\0\\-3\\1\end{bmatrix}$ (d) $\begin{bmatrix}-2\\-1\\0\\0\end{bmatrix}\begin{bmatrix}0\\-3\\0\\-1\end{bmatrix}$

(c)

4. If

$$A=\begin{bmatrix}1 & 3 & 2 & 4\\0 & 1 & 5 & 2\\0 & 0 & 0 & 1\end{bmatrix},\quad \text{then}$$

Rank (A)=

(a) 1 (b) 2 (c) 3 (d) 4

(c)

5. Same as the previous problem ,The basis of col(A) is

(a) $\begin{pmatrix}1\\0\\0\end{pmatrix}\begin{pmatrix}3\\1\\0\end{pmatrix}\begin{pmatrix}2\\5\\0\end{pmatrix}$ (b) $\begin{pmatrix}1\\0\\0\end{pmatrix}\begin{pmatrix}3\\1\\0\end{pmatrix}\begin{pmatrix}4\\2\\1\end{pmatrix}$ (c) $\begin{pmatrix}1\\3\\4\end{pmatrix}\begin{pmatrix}1\\5\\2\end{pmatrix}\begin{pmatrix}0\\0\\1\end{pmatrix}$ (d) $\begin{pmatrix}3\\1\\0\end{pmatrix}\begin{pmatrix}2\\5\\0\end{pmatrix}\begin{pmatrix}4\\2\\1\end{pmatrix}$

(b)