Math02B Assignment 4.4 Last Name_______________1st_________

Give complete solutions to the following problems. Be sure to provide all the necessary steps to support your answers.

1. Find the vector x determined by the given coordinate vector $[x]_B$ and the given basis B.

a. $B=\left\{\begin{bmatrix}-3\\3\end{bmatrix},\begin{bmatrix}1\\-5\end{bmatrix}\right\},[x]_B=\begin{bmatrix}2\\5\end{bmatrix}$

b. $\left\{\begin{bmatrix}5\\-3\\-5\end{bmatrix},\begin{bmatrix}-3\\0\\1\end{bmatrix},\begin{bmatrix}3\\-5\\5\end{bmatrix}\right\},[x]_B=\begin{bmatrix}1\\2\\-2\end{bmatrix}$

2. Find the coordinate vector $[x]_B$ of x relative to the given basis $B=\{b_1,b_2\}$

$b_1=\begin{bmatrix}-2\\3\end{bmatrix},\ b_2=\begin{bmatrix}1\\4\end{bmatrix},\ x=\begin{bmatrix}1\\-7\end{bmatrix}$

3. Find the coordinate vector $[x]_B$ of x relative to the given basis $B = \{b_1, b_2, b_3\}$

$$b_1 = \begin{bmatrix} 1 \\ -1 \\ -2 \end{bmatrix},\ b_2 = \begin{bmatrix} -4 \\ 5 \\ 8 \end{bmatrix},\ b_3 = \begin{bmatrix} 2 \\ -2 \\ 8 \end{bmatrix},\ x = \begin{bmatrix} -9 \\ 10 \\ -6 \end{bmatrix}$$

4. Find the change-of-coordinates matrix from B to the standard basis in $R^2$

$$B = \left\{ \begin{bmatrix} -4 \\ 1 \end{bmatrix}, \begin{bmatrix} -3 \\ 5 \end{bmatrix} \right\}$$

5. Use an inverse matrix to find $[x]_B$ for the given x and B.

$$B = \left\{ \begin{bmatrix} 3 \\ 4 \end{bmatrix}, \begin{bmatrix} 5 \\ 7 \end{bmatrix} \right\},\ x = \begin{bmatrix} 5 \\ -5 \end{bmatrix}$$

6. The set $\{1 - t^2, -2t - t^2\ 1 + t - t^2\}$ is a basis for set of polynomials $P_2$. Find the coordinate vector of $p(t) = -6 - 12t + t^2$ elative to B.