1. $\mathrm{H} = span\left\{\begin{pmatrix}1\\0\\2\end{pmatrix}, \begin{pmatrix}3\\1\\-1\end{pmatrix}\right\}. \dim\mathrm{H} =$

2-3. A는 5×6 행렬(matrix)이고 $\mathrm{Ax} = 0$은 2개의 free variable을 가지면

2. dim Nul A = ?

3. dim Col A = ?

4. A는 4×4 행렬(matrix), difference equation $x_{k+1} = \mathrm{A}x_k\ (k = 0,1,2\ldots), x_0$는 A의 eigenvalue 2에 대한 eigenvector일 때, x_5 =?

5. $\left\{\begin{pmatrix}1\\1\\0\end{pmatrix}, \begin{pmatrix}3\\7\\-2\end{pmatrix}, \begin{pmatrix}0\\2\\-1\end{pmatrix}\right\}$는 R^3의 기저(a basis)인가? 이유는?

6. $\mathrm{B} = \left\{\begin{pmatrix}1\\0\end{pmatrix}, \begin{pmatrix}2\\-1\end{pmatrix}\right\}$. $\mathrm{x} = \begin{pmatrix}4\\5\end{pmatrix} \in \mathrm{R}^2$ 의 B-coordinate를 구하시오.

7-8. $\mathrm{B} = \left\{\begin{pmatrix}1\\0\end{pmatrix}, \begin{pmatrix}2\\-1\end{pmatrix}\right\}$, $\mathrm{C} = \left\{\begin{pmatrix}1\\-1\end{pmatrix}, \begin{pmatrix}1\\2\end{pmatrix}\right\}$

7. Find the change of basis coordinates matrix from B to C.

8. $[\mathrm{x}]_\mathrm{C} = \begin{pmatrix}2\\1\end{pmatrix}$일 때, $[\mathrm{x}]_\mathrm{B}$ =?

9. P_2는 실수계수를 갖는 2차이하의 다항식들의 집합이다.

$\mathrm{T}: \mathrm{P}_2 \to \mathrm{P}_2,\ \mathrm{T}(\mathrm{a}_0 + a_1 t + a_2 t^2) = 2a_2 + a_1 t^2,\ \mathrm{B} = \{1, t, t^2\}$. Find the B-matrix for T.

10. Find all eigenvalues of the matrix $\begin{pmatrix}0 & -4\\1 & 0\end{pmatrix}$ and the corresponding eigenvectors.

11-14. $\mathrm{A} = \begin{pmatrix}1 & 1\\1 & 1\end{pmatrix}$

11. Find all eigenvalues of A and the corresponding eigenvectors.

12. Is A similar to $\mathrm{B} = \begin{pmatrix}2 & 1\\0 & 0\end{pmatrix}$? Explain.

13. Diagonalize A. Explain.

14. $\mathrm{T}: \mathrm{R}^2 \to \mathrm{R}^2,\ \mathrm{T}(\mathrm{x}) = \mathrm{Ax}$. Find a basis B for R^2 with the property that the B-matrix for T is a diagonal matrix. Explain.