Pre-class quiz

Name: Student ID:

Hint : A^{-1}:矩陣 A 的反矩陣
Inverse Matrix : 反矩陣
det(A):矩陣 A 的行列式值

1. Given two vectors(向量) $\vec{a} = (1,3,2,1)^T$ and $\vec{b} = (1,3,2,1)^T$, what is the value of the dot product of $\vec{a} \cdot \vec{b}$? 15
2. Matrix $A = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$, compute the inverse matrix(反矩陣) of A : A^{-1}. = $\begin{bmatrix} -3 & 2 \\ 5/2 & -3/2 \end{bmatrix}$
3. Let $A = \begin{bmatrix} \frac{1}{2} & \frac{1}{2} \\ \frac{1}{2} & \frac{1}{2} \end{bmatrix}$, what is A^{20} ? difficult;

   need to do diagonalization of $2A = \begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ =PDP^{-1} ;

   $$\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix} \begin{bmatrix} 0 & 0 \\ 0 & 2 \end{bmatrix} \begin{bmatrix} 1/2 & -1/2 \\ 1/2 & 1/2 \end{bmatrix}$$

   A^{20} = (1/2)^{20} $\begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$ ($\begin{bmatrix} 0 & 0 \\ 0 & 2 \end{bmatrix}$)^20 $\begin{bmatrix} 1/2 & -1/2 \\ 1/2 & 1/2 \end{bmatrix}$
4. Let $B = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$, what is B^{63} ? $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$
5. Let A be a 5×5 matrix with $\det(A) = 1$. What is the value of $\det(-2A)$? -32
6. Do you have any expectations or suggestions for this course?