

代幾 I 計算演習 [問題] (2007/06/28)

問. 次の様な変換を行う線型変換 T に対応する行列を求めなさい

Q.1

$$T\left(\begin{pmatrix} 4 \\ 0 \\ 1 \end{pmatrix}\right) = \begin{pmatrix} -12 \\ 2 \\ 10 \end{pmatrix}, T\left(\begin{pmatrix} 2 \\ 2 \\ -1 \end{pmatrix}\right) = \begin{pmatrix} -12 \\ 2 \\ 10 \end{pmatrix}, T\left(\begin{pmatrix} -2 \\ -2 \\ 4 \end{pmatrix}\right) = \begin{pmatrix} 12 \\ -8 \\ -16 \end{pmatrix}$$

Q.2

$$T\left(\begin{pmatrix} -3 \\ -2 \\ 0 \end{pmatrix}\right) = \begin{pmatrix} 12 \\ 0 \\ -11 \end{pmatrix}, T\left(\begin{pmatrix} -3 \\ -3 \\ 4 \end{pmatrix}\right) = \begin{pmatrix} 27 \\ 19 \\ -20 \end{pmatrix}, T\left(\begin{pmatrix} -2 \\ -1 \\ -2 \end{pmatrix}\right) = \begin{pmatrix} 1 \\ -9 \\ -3 \end{pmatrix}$$

Q.3

$$T\left(\begin{pmatrix} -1 \\ -2 \\ 2 \end{pmatrix}\right) = \begin{pmatrix} -11 \\ -6 \\ 1 \end{pmatrix}, T\left(\begin{pmatrix} 4 \\ 2 \\ 3 \end{pmatrix}\right) = \begin{pmatrix} -7 \\ -14 \\ 16 \end{pmatrix}, T\left(\begin{pmatrix} 4 \\ 2 \\ -3 \end{pmatrix}\right) = \begin{pmatrix} 11 \\ 10 \\ -8 \end{pmatrix}$$

Q.4

$$T\left(\begin{pmatrix} 3 \\ -2 \\ -3 \end{pmatrix}\right) = \begin{pmatrix} -1 \\ -5 \\ 2 \end{pmatrix}, T\left(\begin{pmatrix} -1 \\ -3 \\ -1 \end{pmatrix}\right) = \begin{pmatrix} -13 \\ 3 \\ 14 \end{pmatrix}, T\left(\begin{pmatrix} 1 \\ 3 \\ 2 \end{pmatrix}\right) = \begin{pmatrix} 16 \\ 0 \\ -14 \end{pmatrix}$$

Q.5

$$T\left(\begin{pmatrix} -3 \\ -3 \\ -3 \end{pmatrix}\right) = \begin{pmatrix} 3 \\ 6 \\ 0 \end{pmatrix}, T\left(\begin{pmatrix} 3 \\ -2 \\ 3 \end{pmatrix}\right) = \begin{pmatrix} -23 \\ 9 \\ 10 \end{pmatrix}, T\left(\begin{pmatrix} 4 \\ 3 \\ 3 \end{pmatrix}\right) = \begin{pmatrix} -7 \\ -4 \\ 2 \end{pmatrix}$$

Q.6

$$T\left(\begin{pmatrix} -2 \\ -3 \\ 4 \end{pmatrix}\right) = \begin{pmatrix} 15 \\ -1 \\ 3 \end{pmatrix}, T\left(\begin{pmatrix} -3 \\ -2 \\ -2 \end{pmatrix}\right) = \begin{pmatrix} -7 \\ 15 \\ -9 \end{pmatrix}, T\left(\begin{pmatrix} 0 \\ 2 \\ 4 \end{pmatrix}\right) = \begin{pmatrix} 18 \\ -18 \\ 10 \end{pmatrix}$$

Q.7

$$T\left(\begin{pmatrix} 2 \\ 2 \\ -1 \end{pmatrix}\right) = \begin{pmatrix} 6 \\ 4 \\ -8 \end{pmatrix}, T\left(\begin{pmatrix} -3 \\ 0 \\ -2 \end{pmatrix}\right) = \begin{pmatrix} -20 \\ 10 \\ -2 \end{pmatrix}, T\left(\begin{pmatrix} 3 \\ 1 \\ 1 \end{pmatrix}\right) = \begin{pmatrix} 17 \\ -5 \\ -2 \end{pmatrix}$$

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A.1

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

A.2

$$\begin{pmatrix} -2 & -3 & 3 \\ 2 & -3 & 4 \\ 3 & 1 & -2 \end{pmatrix}$$

A.3

$$\begin{pmatrix} -1 & 3 & -3 \\ 0 & -1 & -4 \\ -1 & 4 & 4 \end{pmatrix}$$

A.4

$$\begin{pmatrix} 4 & 2 & 3 \\ 0 & -2 & 3 \\ -2 & -4 & 0 \end{pmatrix}$$

A.5

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

A.6

$$\begin{pmatrix} -1 & 1 & 4 \\ -1 & -3 & -3 \\ 1 & 1 & 2 \end{pmatrix}$$

A.7

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