Choose and complete one of the following problems:

1) Let $\beta_1 = \begin{bmatrix} 2 \\ 4 \end{bmatrix}, \beta_2 = \begin{bmatrix} 1 \\ 0 \end{bmatrix}$. Write the vector $\begin{bmatrix} 1 \\ 3 \end{bmatrix}_{\beta_1}$ in terms of $\beta_2$.

2) Diagonalize the matrix $\begin{bmatrix} 2 & 1 \\ 4 & 5 \end{bmatrix}$. Express your answer as an equation involving the matrix and its diagonalization.