1. Give the 2×2 symmetric matrix which has eigenvalues $\lambda_1 = 3$ and $\lambda_2 = 2$ with corresponding eigenvectors $\begin{bmatrix} 1 \\ -3 \end{bmatrix}$ and $\begin{bmatrix} 3 \\ 1 \end{bmatrix}$

   $\begin{bmatrix} -21/10 & -3/10 \\ -3/10 & 29/10 \end{bmatrix}$

2. Consider Q : $13x^2-10xy+13y^2-72=0$, what is the quadratic form with no cross terms by performing a rotation ? (note : not need to show the rotation)

   $\begin{bmatrix} x & y \end{bmatrix} \begin{bmatrix} 13 & -5 \\ -5 & 13 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = 72$ or $18'^2+8y'^2 = 72$ or $x'^2/4+y'^2/9 = 1$