MECH 6325 HW 1

13) $[X\ Y]^T$

$$C = \begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix} = \begin{bmatrix} \sigma_x^2 & \alpha_{xy} \\ \alpha_{yx} & \sigma_y^2 \end{bmatrix}$$

$$P = \begin{bmatrix} -1 & 1 \\ 1 & 1 \end{bmatrix}$$

$\lambda = 1, 3$

$$X = \begin{pmatrix} -1 \\ 1 \end{pmatrix}, \begin{pmatrix} 1 \\ 1 \end{pmatrix}$$

$$\boxed{Z = P[X\ Y]^T}$$

$$C' = PCP^{-1} = \begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$$

$$\boxed{\begin{aligned} \sigma_{x'}^2 &= 1 \\ \sigma_{y'}^2 &= 3 \end{aligned}}$$