

Problem 1

Find a linear transformation which maps the unit circle to an ellipse with major and minor axes of lengths 5 and 3, respectively. The major axis should align with the y -axis.

Problem 2

Is there a linear transformation that takes the three points $(1,0)$, $(1,1)$ and $(0,1)$ to $(2,0)$, $(1,1)$, $(0,2)$?

Problem 3

Let

$$A = \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix}.$$

Compute A^2 , A^{-1} and $A + B$ where

$$B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}.$$