ME 3001, Spring 2024

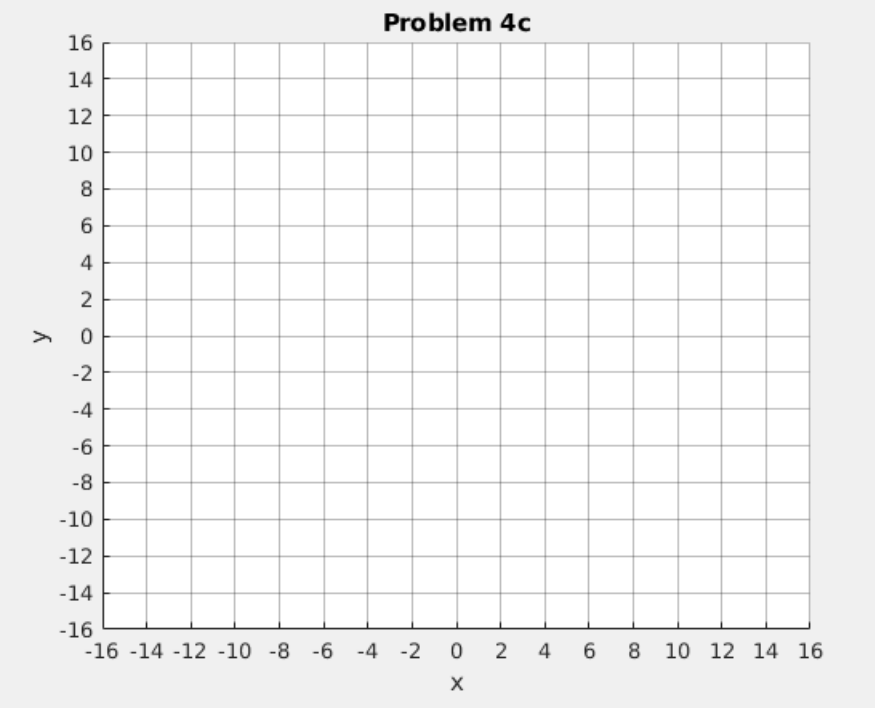
Weekly Problem 4: Eigenvalues and Eigenvectors

Complete the following regarding the Eigenvalue Problem for 2D vectors.

1. Given: $[A] = \begin{bmatrix} 3 & 2 \\ 3 & -2 \end{bmatrix}$, $\{v\} = \begin{Bmatrix} 4 \\ 2 \end{Bmatrix}$, and $\{u\} = \begin{Bmatrix} -3 \\ 1 \end{Bmatrix}$

   Find: $\{v'\} = [A]\{v\}$ and $\{u'\} = [A]\{u\}$

2. Sketch all 4 vectors (v, v', u, u') on the graph paper given to scale as best as possible.



3. Is either $\{v\}$ or $\{u\}$ an Eigenvector of $[A]$? If so what is the Eigenvalue?

4. Find the second Eigenvalue of $[A]$ as well as 1 Eigenvector associated with it.