

1. Answer the following questions about $A \in \mathbb{R}^{2 \times 2}$ below.

$$A = \begin{pmatrix} 3 & 2 \\ 3 & -2 \end{pmatrix}.$$

(a) Find the eigenvalues and eigenvectors of A . *[4 points]*

(b) Factor A into $A = X\Lambda X^{-1}$. *[2 points]*

(c) (Fill in the blanks) If $A = X\Lambda X^{-1}$, then $A^3 = () () ()$ and $A^{-1} = () () ()$ [3 points]

(d) List the topic(s) that you would like to see reviewed during the final week. Some options include: Solving and solvability of $A\vec{x} = \vec{b}$, the four fundamental subspaces, projections, determinants, eigenvectors/values, others...? [1 point]