Quiz 8

MATH 221-02

DUE: Monday, April 13, 2015 Section 6.1, 6.2.

(Section 6.1, problem #2) Let $A = \begin{pmatrix} 1 & 4 \\ 2 & 3 \end{pmatrix}$.

1. Find the eigenvalues of A. Show your work.

2. Find the eigenvector corresponding to the eigenvalue of $\lambda = 5$. Show your work.

3. The eigenvector corresponding to $\lambda = -1$ is $\begin{bmatrix} -2 \\ 1 \end{bmatrix}$. Together with your answer to #2, organize your eigenvectors into a matrix S, and organize your eigenvectors as a diagonal matrix Λ.

4. Can A be written as the eigendecomposition $A = S\Lambda S^{-1}$? Explain why or why not.

5. Can all vectors in $\Re^2$ be written as a linear combination of the eigenvectors of A? Explain why or why not.

6. Draw the "blob diagram". Clearly show the eigenvectors of A in the left blob, and show how A stretches, squishes, flips or rotates $\Re^2$ in the right blob. What about the eigenvalues tells you <u>why</u> you get the stretches, squishes, flips or rotates?