

## Exercises on diagonalization and powers of A

**Problem 22.1:** (6.2 #6. *Introduction to Linear Algebra: Strang*) Describe all matrices  $S$  that diagonalize this matrix  $A$  (find all eigenvectors):

$$A = \begin{bmatrix} 4 & 0 \\ 1 & 2 \end{bmatrix}.$$

Then describe all matrices that diagonalize  $A^{-1}$ .

**Problem 22.2:** (6.2 #16.) Find  $\Lambda$  and  $S$  to diagonalize  $A$  :

$$A = \begin{bmatrix} .6 & .9 \\ .4 & .1 \end{bmatrix}.$$

What is the limit of  $\Lambda^k$  as  $k \rightarrow \infty$ ? What is the limit matrix of  $S\Lambda^k S^{-1}$ ? In the columns of this matrix you see the \_\_\_\_\_.

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18.06SC Linear Algebra  
Fall 2011

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