

Homework 8

chapter 11

1. a) $M\vec{v} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$

2. a) $MM' = \begin{pmatrix} 4 & 17 \\ 1 & 6 \end{pmatrix}$ $M'M = \begin{pmatrix} 2 & 9 \\ 1 & 8 \end{pmatrix}$

b) $M\vec{v} = \begin{pmatrix} 9 \\ 7 \end{pmatrix}$

b) $MM' = \begin{pmatrix} 9 & 9 \\ 2 & 11 \end{pmatrix}$ $M'M = \begin{pmatrix} 15 & -2 \\ 3 & 5 \end{pmatrix}$

c) $M\vec{v} = \begin{pmatrix} .2 \\ .4 \end{pmatrix}$

c) $MM' = \begin{pmatrix} 15 & -2 \\ 18 & -15 \end{pmatrix}$ $M'M = \begin{pmatrix} 9 & 54 \\ 2 & -9 \end{pmatrix}$

3. a) $M = \begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix}$ $\det M = 1$
 $\text{tr } M = 2$

b) $M = \begin{pmatrix} 0 & 9 \\ 3 & -4 \end{pmatrix}$ $\det M = -27$
 $\text{tr } M = -4$

c) $M = \begin{pmatrix} 2 & 5 \\ 1 & 6 \end{pmatrix}$ $\det M = 7$
 $\text{tr } M = 8$

4. $\begin{pmatrix} 1 & 2 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 1 \\ 0 \end{pmatrix} = \begin{pmatrix} 1 \\ 0 \end{pmatrix} \Rightarrow \begin{pmatrix} 1 \\ 0 \end{pmatrix}$ is an eigenvector with eigenvalue 1