

Name: _____
Due: 06/08

ESMI Applied Math
Worksheet 2

Problem 1. Compute the dot product between the following vectors or state if the dot product cannot be computed.

(a) $u = \begin{bmatrix} -2 \\ -7 \\ 1/2 \end{bmatrix}$ and $v = \begin{bmatrix} 0 \\ 10 \\ 2 \end{bmatrix}$

(b) $u = \begin{bmatrix} -2 \\ -7 \end{bmatrix}$ and $v = \begin{bmatrix} 0 \\ 10 \\ 2 \end{bmatrix}$

Problem 2. Compute the matrix-matrix product between the following matrices or state if you cannot compute the matrix-matrix product.

(a) $A = \begin{bmatrix} 1 & 0 \\ 1 & 1 \\ 1 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

(b) $A = \begin{bmatrix} -2 & 17 & 15 \\ -7 & -10 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 17 & 15 \\ -7 & -10 & 2 \end{bmatrix}$

Problem 3. Compute the matrix-matrix product B^2 when $B = \begin{bmatrix} 0 & -1 & -2 \\ 1 & -10 & 3 \\ 1 & 0 & -1 \end{bmatrix}$

Problem 4. What condition must a matrix A satisfy in order for you to be able to compute the matrix-matrix product A^2 ?

Problem 5. Compute the eigenvalues and eigenvectors of

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