

NAME \_\_\_\_\_

1. Given the following matrices compute the following:

$$A = \begin{bmatrix} 5 & 5 \\ 3 & 4 \end{bmatrix} \quad B = \begin{bmatrix} 1 & -2 \\ 4 & 7 \end{bmatrix} \quad C = \begin{bmatrix} 1 & 3 \\ 2 & 6 \end{bmatrix}$$

- a. The product  $AB$

$$AB = \underline{\hspace{10em}}$$

- b. The inverse  $A^{-1}$

$$A^{-1} = \underline{\hspace{10em}}$$

c. The characteristic equation of  $A$

$$\Delta(\lambda) = \underline{\hspace{10cm}}$$

d. The eigenvalues of  $A$

$$\lambda_1, \lambda_2 = \underline{\hspace{10cm}}$$

e. The eigenvectors of  $A$

$$X_1, X_2 = \underline{\hspace{10cm}}$$

f. The scalar  $\lambda$  and the vector  $X$  that satisfies  $AX = \lambda X$ .

$$\lambda, X = \underline{\hspace{10cm}}$$

g. Show that  $C^{-1}$  does not exist.

h. Show that the 2 vectors in  $C$  linearly dependent.