

Answer the following questions NEATLY on a separate piece of paper.

- 1) Describe in your own words how to perform the following operations and how to determine when the operations are not possible. Include in your description a solved example.
 - a) Add and subtract matrices. (see page 26, example 3)
 - b) Multiply matrices by a scalar (see page 27, example 4)
 - c) Multiply matrices. (see page 27-28, example 5)
 - d) Compute a determinant by cofactor expansion (see page 87, example 4)
 - e) Solve a system of equations using Gaussian elimination/row operations (see page 5, example 3).

- 2) Consider the matrices $A = \begin{bmatrix} 3 & 0 \\ -1 & 2 \\ 0 & -2 \end{bmatrix}$, $B = \begin{bmatrix} 0 & 1 \\ 1 & 0 \\ -1 & -1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 3 & 0 \end{bmatrix}$. Find the following or indicate that it

is not possible.

- a) $A - B$
- b) $A + C$
- c) AB
- d) AC

- 3) Find $\det \begin{pmatrix} \begin{bmatrix} 0 & 2 & 3 & 3 \end{bmatrix} \\ \begin{bmatrix} 1 & -1 & -5 & 0 \end{bmatrix} \\ \begin{bmatrix} 0 & 0 & -1 & 0 \end{bmatrix} \\ \begin{bmatrix} 3 & 0 & -4 & 2 \end{bmatrix} \end{pmatrix}$

- 4) Solve using Gaussian elimination: $\begin{cases} x_1 - 3x_2 + x_4 = 0 \\ x_2 - x_3 = 1 \end{cases}$