

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

Compute  $A+B$ ,  $AB$ ,  $A^{-1}$ ,  $B^{-1}$ ,  $(AB)^{-1}$ ,  $B^T A^T$

2.  $A = \begin{bmatrix} 1 & -2 \\ 0 & -1 \end{bmatrix}$   $B = \begin{bmatrix} 2 & 1 \\ -1 & 1 \end{bmatrix}$   $C = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$

Compute  $2A + B + 3C$ ,  $(ABC)^T$ ,  $C^T B^T A^T$

3.  $A = \begin{bmatrix} 1 & 2 & 3 \\ 6 & 5 & 4 \\ 7 & 8 & 9 \end{bmatrix}$   $B = \begin{bmatrix} 2 \\ 4 \\ 6 \\ 8 \end{bmatrix}$   $C = \begin{bmatrix} 1 & 3 \\ 5 & 7 \\ 9 & 0 \end{bmatrix}$

Compute  $AC$ ,  $A^T$ ,  $C^T$ ,  $C^T A^T$   $AB$   $B^T A$

4.  $A = \begin{bmatrix} 1 & 2 & -1 & 2 \\ 0 & 0 & -1 & 1 \\ 2 & 1 & -2 & 0 \end{bmatrix}$   $B = \begin{bmatrix} 1 & -1 & 1 & 0 \\ 1 & 0 & -1 & 3 \\ 0 & 2 & -1 & 1 \\ 1 & 0 & 0 & 2 \end{bmatrix}$   $C = [C_{ij}] = AB$

Compute  $C_{11}$ ,  $C_{23}$ ,  $C_{31}$ ,  $C_{33}$

5.  $M = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$   $A = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 0 & 0 & 1 \end{bmatrix}$   $B = \begin{bmatrix} 1 & -1 & 0 \\ 0 & 2 & 0 \\ -1 & 1 & 3 \end{bmatrix}$   $C = \begin{bmatrix} 1 & 0 & 0 & 1 \\ 0 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \\ 0 & 1 & 2 & 0 \end{bmatrix}$

Compute  $|M|$ ,  $|A|$ ,  $|B|$ ,  $|C|$ ,  $M^{-1}$ ,  $A^{-1}$ ,  $B^{-1}$ ,  $C^{-1}$

6. Write the system equations in matrix form and solve using matrix methods. 7. Same as 6, for

$$x + 2y + z = -2$$

$$x - y + 2z = -1$$

$$3x + y - z = 4$$

$$u + v + w = 3$$

$$u + 2v + 2w = 4$$

$$2u - v + w = 2$$