Please work in groups of 2-4 people, and hand in your answers the following questions on separate paper.

1. Let 
   \[ A = \begin{bmatrix} 1 & -2 & 0 \\ 3 & 2 & -1 \\ -2 & 1 & 3 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 4 & -2 & 3 \\ -1 & 5 & 0 \\ 6 & 1 & 2 \end{bmatrix} \]

   (a) Calculate \( A^T + B^T \).
   (b) Calculate \( (A + B)^T \).
   (c) Are (a) and (b) the same? If not, how do they differ?

2. Let 
   \[ x = \begin{bmatrix} 0 \\ 1 \\ 1 \end{bmatrix} \quad \text{and} \quad y = \begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix} \]

   (a) Calculate \( x^T y \).
   (b) Calculate \( y^T x \).
   (c) Are (a) and (b) the same? If not, how do they differ?

3. Let 
   \[ A = \begin{bmatrix} 1 & -2 & 1 \\ 0 & 2 & -1 \\ 2 & 1 & 1 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 2 & 1 & -1 \\ 1 & -1 & 0 \\ 2 & -1 & 1 \end{bmatrix} \]

   (a) Calculate \( AB \).
   (b) Calculate \( BA \).
   (c) Are (a) and (b) the same? If not, how do they differ?

4. Let 
   \[ A = \begin{bmatrix} 3 & -1 \\ 6 & 2 \end{bmatrix} \]

   (a) Calculate \( |A| \).
   (b) Calculate \( A^{-1} \).
   (c) Calculate \( AA^{-1} \).
   (d) Calculate \( A^{-1}A \).
   (e) Are (c) and (d) the same? If not, how do they differ?