

**Badji Mokhtar University, Annaba**  
**Faculty of Economic, Commercial and Management Sciences**  
**Department of Financial and Accounting Science.**  
**Written Interrogation in data analysis**

### Exercise 01

Let the two matrices be:

$$A = \begin{pmatrix} 1 & -3 \\ 4 & 2 \end{pmatrix}$$

$$B = \begin{pmatrix} 5 & 0 \\ -1 & 6 \end{pmatrix}$$

Tasks:

1. Compute:  $A + B$
2. Compute:  $2A - B$
3. Check whether  $AB = BA$
4. Find the determinant of  $A$ :  $\det(A)$
5. If  $A$  is invertible, find the inverse:  $A^{-1}$

### Exercise 02

You are given the following matrix:

$$X = \begin{bmatrix} 4 & 5 \\ 6 & 7 \\ 8 & 0 \end{bmatrix}$$

1. **Compute the centered matrix** (after subtracting the mean of each column) and the **standardized matrix** (after dividing by the standard deviation of each column).
2. **Compute the covariance matrix**
3. **Compute the eigenvalues** of the covariance matrix.