

HOMEWORK 3

Question 1: Mathematical Series Calculation

Write a MATLAB script using a `for` loop to compute the sum of the first 30 terms of the following series:

$$S = \sum_{k=1}^{30} (4k^2 - 3k + 2)$$

Your program should calculate and display the final sum.

Question 2: Array Manipulation and Indexing

Create a **5×5 matrix**, where each element is defined by the formula:

$$A(i, j) = 2i + 3j$$

Then, write a MATLAB script to compute the sum of the **first three diagonal elements** and display the result.

Question 3: Factorial Calculation

Write a MATLAB script that takes a **user input** (a positive integer `n`) and calculates its **factorial** using a `for` loop.

The factorial of a number `n` is defined as:

$$n! = n \times (n - 1) \times (n - 2) \times \dots \times 1$$

The program should display the calculated factorial.