(3) Consider the following differential equation

$$-\frac{d}{dx}(3x^2\frac{du}{dx}) + 2u + 3 = 0$$

defined for $x \in [2, 5]$ and with boundary conditions $u(2) = 3, u(5) = 8$. Applying the Finite Element Method with 200 **linear finite elements** of equal length:

(a) Compute the assembled stiff matrix and write the element K(50,50):

K(50,50)=	2.9921e+03

Hint1: We know that K(20,21)= $-1.0511e + 03$

Hint2: You can use that the stiff matrix associated to a term $a_1(x) = ax^2$ is

$$K^{k,1} = \frac{a}{3h_k^2}(x_{i+1}^3 - x_i^3)\begin{pmatrix} 1 & -1 \\ -1 & 1 \end{pmatrix}$$

(b) Compute $meanValue$, the mean of the values of u obtained, and compute N, the number of nodes for which the value of u fulfills $|u - meanValue| < 0.1$:

$meanValue =$	5.9182e+00
$N =$	9

(**Hint:** We know that u(25)=3.9730e+00)

(3 points)