**MTH603 Assignment #1 Spring 2024**

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**Answer of Q#1:**

First convert the given equation into matrix form:









Now, we will use the back substitution method:

From equation 4



From equation 3



From equation 2



From equation 1



So, the solution using back substitution is:









**Answer of Q#2:**

Let assume that:

F(x) = x3 – 3x2 - 12x + 8

Now let’s see the iterations:

First Iteration:

x1 = -1.5

x2 = 2.5

f(-1.5) = 15.875 > 0

f(2.5) = 25.125 < 0

The signs of f(x1) and f(x2) are opposite. So, the roots lie between x1 and x2.

The general formula of False-Position method is:



Put n = 2



So, the required solution after 1st iteration is 7.4076.

Second Iteration:

f(x3) = 7.4076 > 0

f(x2) = f(2.5) = -25.125 < 0

f(x3) and f(x2) are opposite in signs, so the root lies between x3 and x2.



So, the required solution after 2nd iteration is -0.1643.

Third Iteration:

f(x4) = f(0.6069) = 0.1643 < 0

f(x3) = f(0.0488) = 7.4076 > 0

f(x4) and f(x3) are opposite in signs, so the root lies between x4 and x3.



So, the required solution after 3rd iteration is 0.0129.

Fourth iteration:

f(x5) = 0.0129

f(x4) = 0.1643

The root lies between x4 and x5.



The required solution after fourth iteration is 8.8769.