|  |  |
| --- | --- |
| LAB # 2 | |
| **Finding out roots of an equation using Bisection Method** | |
| Student Name: | Kamil Rasheed Siddiqui |
| Registration Number: | ME201024 |
| Semester: | 5 |
| Group: | A |
| Date of Submission: | November 11, 2022 |
|  |  |

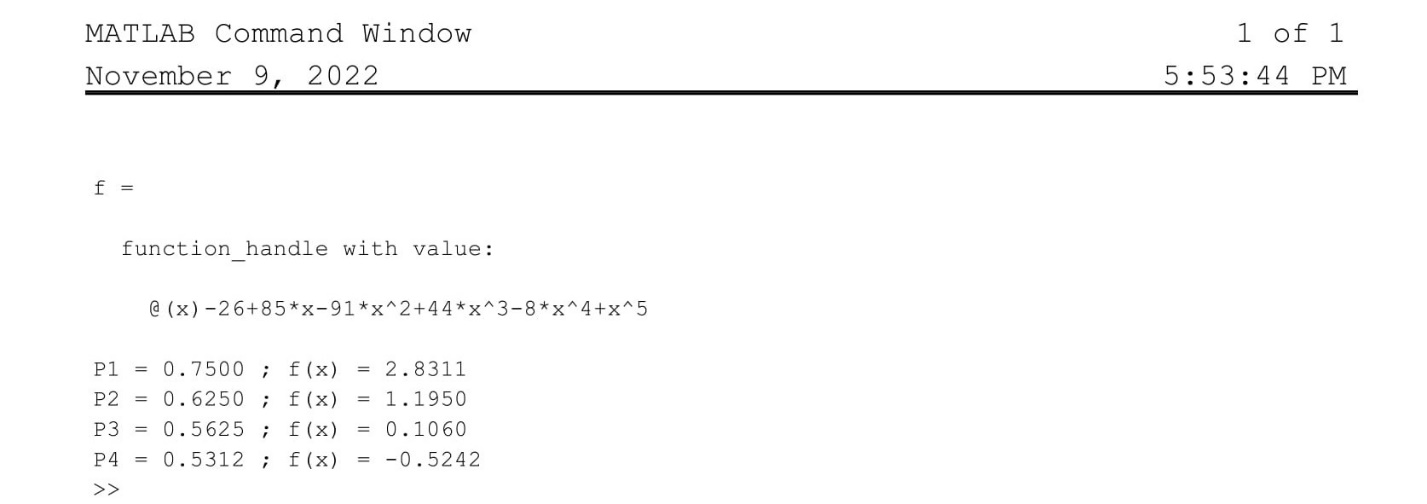
**Problem Statement:**

**Determine the real root of f (x) = -26 + 85x - 91x^2 + 44x^3 – 8x^4 + x^5 using bisection method to locate the root. Employ initial guesses of x\_i = 0.5 and x\_u = 1.0 and iterate until the estimated error falls below a level of error = 10%.**

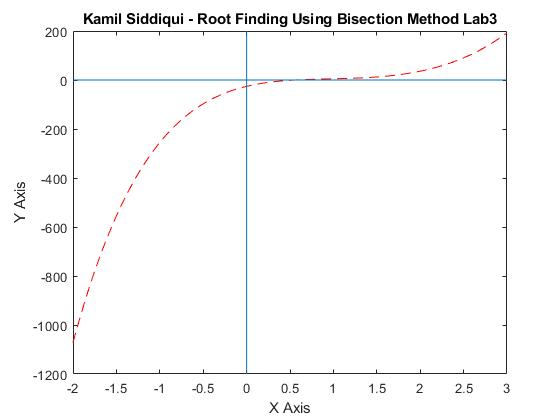
**Program Code:**

|  |
| --- |
| clear, clc  %% Defining Equation  f = @(x) - 26 + 85\*x - 91\*x^2 + 44\*x^3 - 8\*x^4 + x^5    x\_i = 0.5;  x\_u = 1.0;  n = 5;  e = 0.1;    if f(x\_i)\*f(x\_u) < 0  for i = 1:n  x\_r = (x\_i + x\_u)/2;  fprintf('P%d = %.4f ; f(x) = %.4f \n', i, x\_r, f(x\_r));  if abs((x\_r-x\_u)/x\_r) < e || abs((x\_r-x\_i)/x\_r) < e  break  end  if f(x\_i)\*f(x\_r) < 0  x\_u = x\_r;  elseif f(x\_u)\*f(x\_r) < 0  x\_i = x\_r;  end  end  else  disp('No roots between the limits')  end    %% Plotting    temp\_x = -2:0.01:3;  for i = 1:length(temp\_x)  y(i) = f(temp\_x(i));  end    plot(temp\_x,y, 'r--'); hold on;  plot(x\_r,f(x\_r)); hold on;  line([-2 3], [0 0]), line([0 0], [-1200 200])  xlabel('X Axis')  ylabel('Y Axis')  title('Kamil Siddiqui - Root Finding Using Bisection Method Lab3') |

**Results:**



**Graphical Result:**

****