



Regula Falsi
Method

Dyllan
Macharia,
Precious
Anyangu,
Kevin Ogaba

The Regula Falsi

Demonstrating the Regula Falsi Method

D. Macharia¹ K. Ogaba² P. Anyangu³



Introduction

Regula Falsi Method

Dyllan
Macharia,
Precious
Anyangu,
Kevin Ogaba


The Regula Falsi is a numerical method for estimating the roots of a polynomial $f(x)$. You can approximate the function with a line using two endpoints $[a, b]$. The endpoints are joined with a chord; The point where the chord crosses the x -axis is the new “guess” for the root. The appropriate endpoint is updated with the new guess, then the algorithm continues, getting closer to the actual root.

Steps

Regula Falsi Method

Dyllan
Macharia,
Precious
Anyangu,
Kevin Ogaba

- 1 Define the function $f(x)$
- 2 define the maximum iterations and tolerance
- 3 Choose the initial guess x_0 and x_1 such that x_0 is less than x_1 and the product of $f(x_0)$ and $f(x_1)$ is less than zero
- 4 Determine x : $x = (x_0 * f(x_1) - b * f(x_1)) / (f(x_1) - f(x_0))$
- 5 Check whether the product of $f(x_1)$ and $f(x)$ is negative or not. If it is negative, then assign $x_0 = x$; if it positive, then assign $x_1 = x$;
- 6 Check whether the value of $f(x)$ is greater than tolerance or not. If yes, goto step4, if no, goto step 7
- 7 Display the root as x



Advantages

Regula Falsi
Method

Dyllan
Macharia,
Precious
Anyangu,
Kevin Ogaba

- 1 It does not require the derivative calculation
- 2 The method has the first order rate of convergence i.e It is linearly convergent. It always converges



Disadvantages

Regula Falsi Method

Dyllan
Macharia,
Precious
Anyangu,
Kevin Ogaba

- 1 As it is trial and error method in some cases, it may take large time span to calculate the correct root and thereby slowing down the process
- 2 It is used to calculate only a single unknown in the equation.