

Exercises

Q1:- Find the approximate roots of the following equation

$f(x) = 4x - x^2 - 2 = 0$ on $[0,1]$, by using fixed point method (for three iterative steps), and find the iterative errors at each step. What is the stop condition?

Q2:- Find the approximate value of $\sqrt[3]{25}$ by using Bisection Algorithm (for three iterative steps) and find the absolute errors at each step.

Hint: consider $f(x) = x^3 - 25 = 0$, $2 < x < 3$, and the exact value $\sqrt[3]{25} = 2.9240$

Q3:- Use Newton-Raphson algorithm to find the approximate roots of the following equation

$f(x) = \frac{x}{\pi} + \cos(x) = 0$, with considering $x_0 = 3$, for three iterative steps, and find the absolute errors at each step.

Q4:- Show that secant algorithm is quadratically convergent, while Bisection and False position algorithm are linearly convergent .