

Numerical Methods: Homework #1

Based on Bisection Method

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Problem 1

Consider the function $f(x) = x^3 - 4x - 9$. We want to find one of its roots using the bisection method. Check whether the bisection method is applicable for the given values of a and b .

1. $a = 0$ and $b = 1$.
2. $a = 1$ and $b = 2$.
3. $a = 2$ and $b = 3$.
4. $a = -1$ and $b = -2$.
5. $a = 0$ and $b = -1$.

Problem 2

Find a root of the equation $x^3 - 4x - 9 = 0$, using the bisection method correct upto three decimal places. How many iterations are needed?

Problem 3

Use bisection method to find the value of $\sqrt{10}$ correct upto 2 decimal places.

Problem 4

Use bisection method to approximate the root of the equation $e^x = 3x$.

Problem 5

Use bisection method to approximate the root of the equation $3x = 1 + \cos x$.

Problem 6

Find the root of the equation $\cos x = xe^x$ using the bisection method correct to four decimal places.