

Numerical Analysis homework 1

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I. Consider the bisection method starting with the initial interval $[1.5, 3.5]$.

I-a.

Width of the interval at the n th step

The bisection method halves the interval at each step.

For the interval $[1.5, 3.5]$, the initial width is $3.5 - 1.5 = 2$. Therefore, the width at the n -th step is : $W_n = \frac{2}{2^n} = \frac{1}{2^{n-1}}$

I-b.

Supremum of the distance between the root r and the midpoint of the interval

The distance between the root r and the midpoint of the interval after n steps, denoted as D_n , is always less than or equal to half the width of the interval.

In the case of the interval $[1.5, 3.5]$, this becomes: $D_n = \frac{2}{2^{n+1}} = \frac{1}{2^n}$

II. Briefly repeat the problem

Give your answers here.

Acknowledgement

Give your acknowledgements here(if any).

If you are not familiar with `bibtex`, it is acceptable to put a table here for your references.

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