

Free Response – Spring 2021 – Bisection Method

A student is using the bisection method to find the root of an equation $f(x) = 0$. The initial bracket for the root estimate used by the student is $[16, 48]$. The bracket is found to be valid.

- a) What is the estimated root of $f(x) = 0$ at the end of the first iteration?
- b) After 4 iterations, the absolute true error in the estimate of the root would follow this inequality $0 \leq |E_t| < a$. What is the smallest value of a you can put in the inequality? Note the function $f(x)$ is not given to you. Sketching it out can be helpful.