

UNIVERSITY OF MINES AND TECHNOLOGY, TARKWA
DEPARTMENT OF MATHEMATICAL SCIENCES

MA 376

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Optimization Techniques

Quiz Two

Time: 1h :30min

Date: August, 2022

Leave all answers to 4 d.p.

$\left(\frac{2}{3}\right)^n (b-a) <$
 $\left(\frac{2}{3}\right)^n$

1. Minimize $f(x) = x^2 - 7x + 12$ subject to $2 \leq x \leq 4$, using the three-point equal interval search method. Reduce the interval of uncertainty to be less than 15% of the original.
2. Find the total number of evaluations required to reduce the interval of uncertainty to be less than 50% hence minimize $f(x) = 2 - 4x + e^x$, subject to $[0.5, 2.5]$ using the two-point equal interval search method.
3. Maximize $f(x) = \frac{1}{(x-1)^2} \left(\log x - 2 \frac{x-1}{x+1} \right)$ in the interval $[1.5, 4.5]$, using the dichotomous search method, take $\varepsilon = 0.1$. Perform three (3) applications.

3.2
3.25
3.75