

Multiple-Choice Test

Chapter 09.01

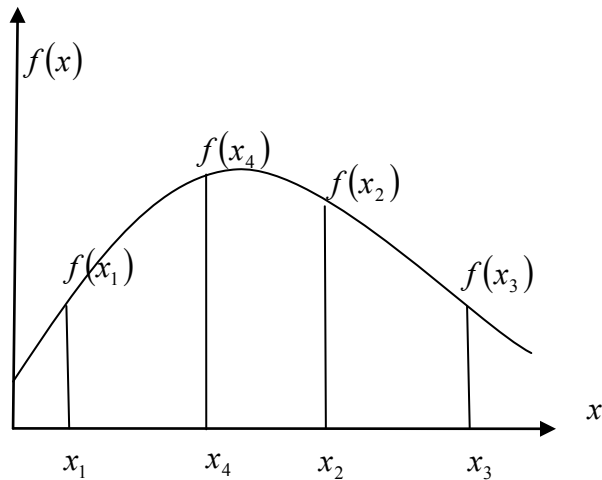
Golden Section Search Method

1. Which of the following statements is incorrect regarding the Equal Interval Search and Golden Section Search methods?
 - (A) Both methods require an initial boundary region to start the search
 - (B) The number of iterations in both methods are affected by the size of ϵ
 - (C) Everything else being equal, the Golden Section Search method should find an optimal solution faster.
 - (D) Everything else being equal, the Equal Interval Search method should find an optimal solution faster.

2. Which of the following parameters is not required to use the Golden Section Search method for optimization?
 - (A) The lower bound for the search region
 - (B) The upper bound for the search region
 - (C) The golden ratio
 - (D) The function to be optimized

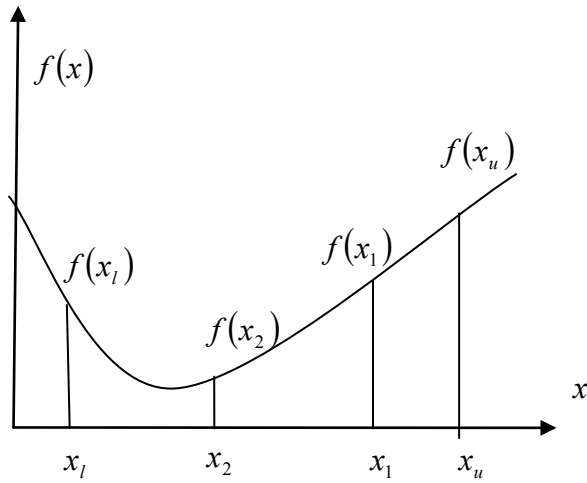
3. When applying the Golden Section Search method to a function $f(x)$ to find its maximum, the $f(x_1) > f(x_2)$ condition holds true for the intermediate points x_1 and x_2 . Which of the following statements is incorrect?
 - (A) The new search region is determined by $[x_2, x_u]$
 - (B) The intermediate point x_1 stays as one of the intermediate points
 - (C) The upper bound x_u stays the same
 - (D) The new search region is determined by $[x_l, x_1]$

4. In the graph below, the lower and upper boundary of the search is given by x_1 and x_3 respectively. If x_4 and x_2 are the initial intermediary points, which of the following statement is false?



- (A) The distance between x_2 and x_1 is equal to the distance between x_4 and x_3
- (B) The distance between x_4 and x_2 is approximately 0.618 times the distance between x_2 and x_1
- (C) The distance between x_4 and x_1 is approximately 0.618 times the distance between x_4 and x_3
- (D) The distance between x_4 and x_1 is equal to the distance between x_2 and x_3
5. Using the Golden Section Search method, find two numbers whose sum is 90 and their product is as large as possible. Use the interval $[0,90]$.
- (A) 30 and 60
- (B) 45 and 45
- (C) 38 and 52
- (D) 20 and 70

6. Consider the problem of finding the minimum of the function shown below. Given the intermediate points in the drawing, what would be the search region in the next iteration?



- (A) $[x_2, x_u]$
(B) $[x_1, x_u]$
(C) $[x_l, x_1]$
(D) $[x_l, x_2]$