Dipyanshu

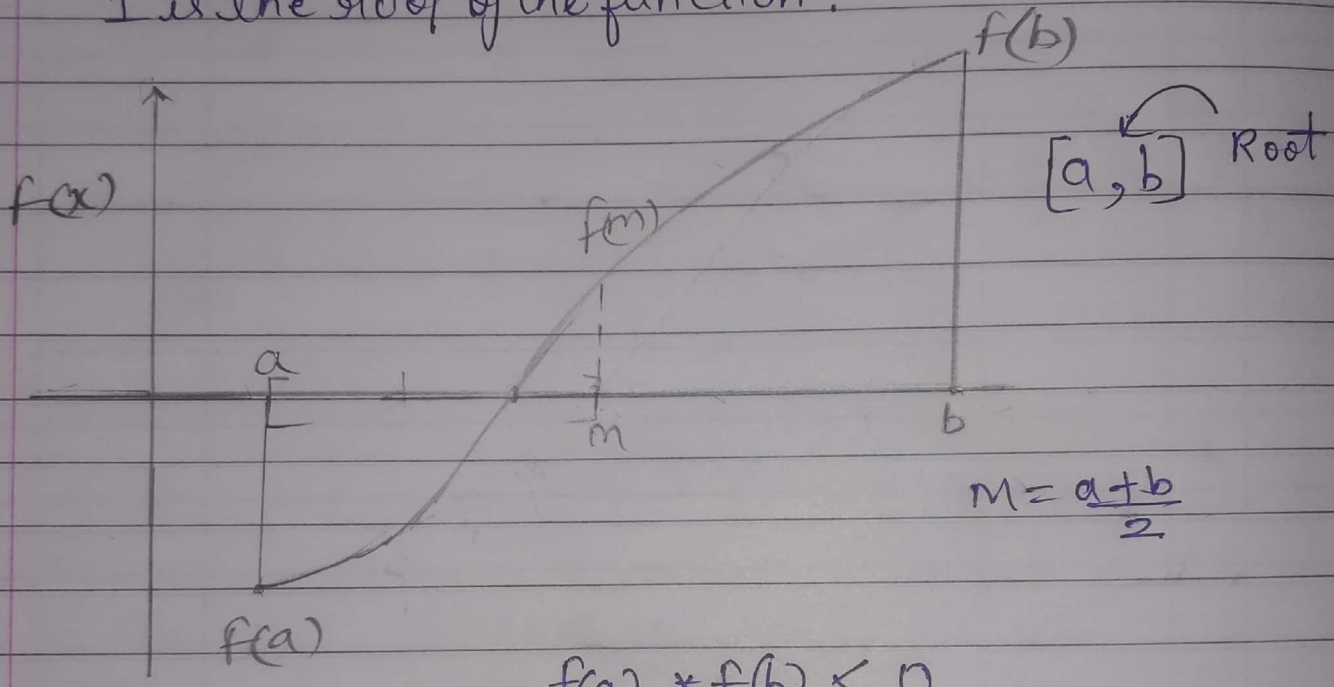
$f(x) = 0$

$f(x) = x^2 - 2x + 1$

$f(1) = 1^2 - 2 \times 1 + 1$

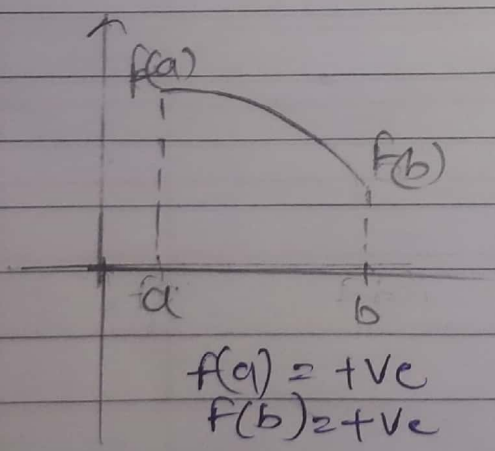
$f(1) = 0$

1 is the root of the function.



$M = \frac{a+b}{2}$

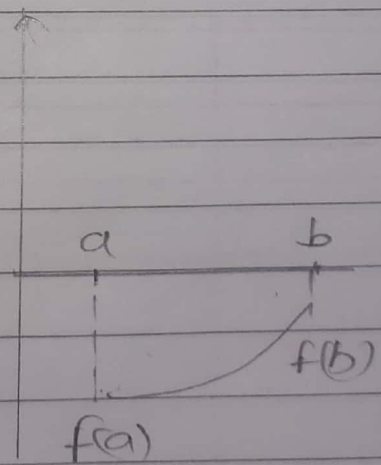
$f(a) * f(b) < 0$



$f(a) = +Ve$

$f(b) = +Ve$

$f(a) * f(b) = +Ve$



$f(a) = -Ve$

$f(b) = -Ve$

$f(a) * f(b) = -Ve$

Bisection Method

Algorithm

1. start
2. Define function $f(x)$
3. Choose initial guess a and b such that $f(a) * f(b) < 0$
4. choose specified error E.
5. Calculate new approximated root as
   $m = \frac{a+b}{2}$
6. Calculate $f(a) * f(m)$
   a. if $f(a).f(m) < 0$ then $b = m$
   b. if $f(a)f(m) > 0$ then $a = m$
   c. if $f(a)f(m) = 0$ then goto (8)
7. if $|f(m)| > e$ then goto (5) otherwise goto (8)
8. Display m as the root
9. stop