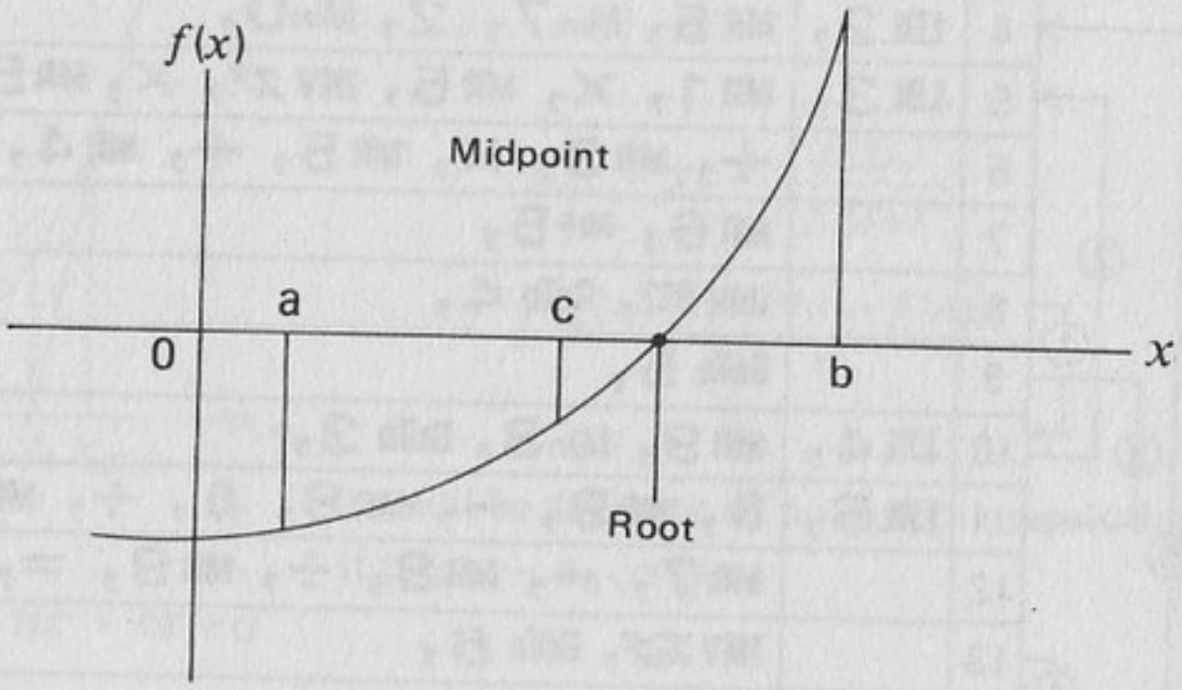
CASIO PROGRAM SHEET

Program for	No.	
Solving an equation by the midpoint method	Mathematics–9	

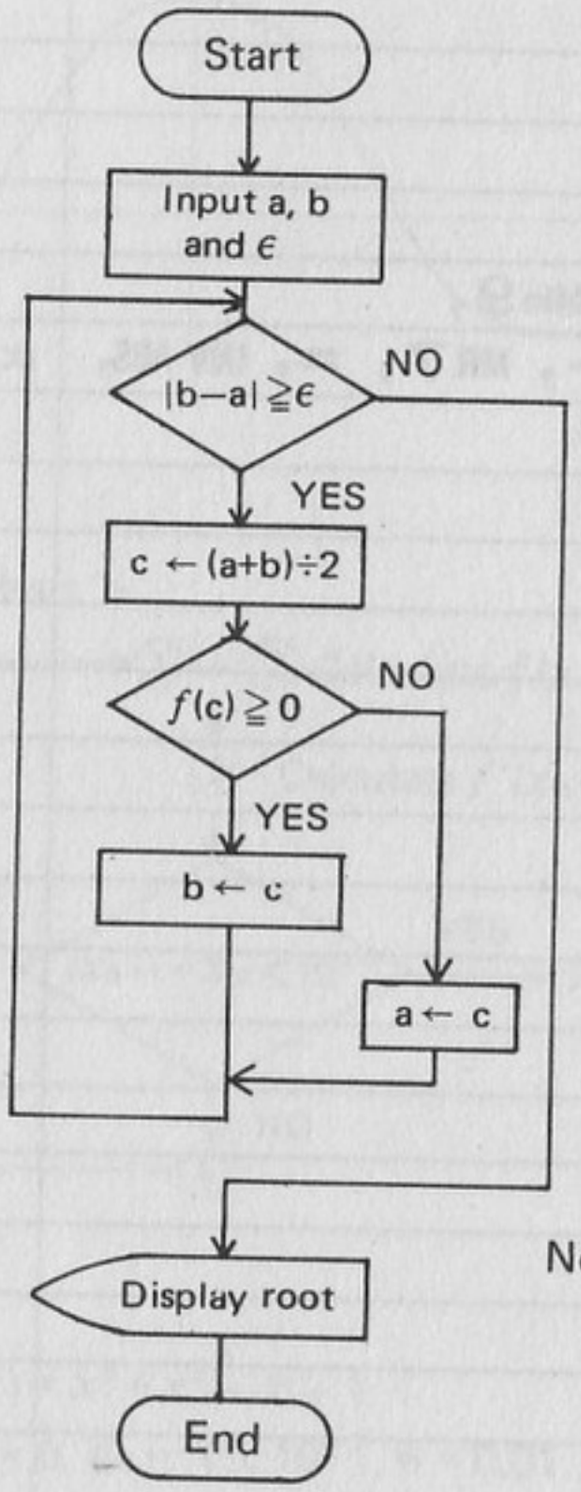
Description

- Input the program written in the next page.

Let $f(x)$ be continuous in [a, b], $f(a) < 0$ and $f(b) > 0$.
Then there is a solution of $f(x) = 0$ in [a, b].



< Flowchart >



Example

$f(x) = x^3 + x^2 - x - 1$

a = 0, b = 2 ($f(0) < 0$, $f(2) > 0$)

ϵ = 0.00001 (ϵ: accuracy)

Obtain an approximate solution of $f(x) = 0$

Note: Input $f(x)$ as subroutine P1.

Step	Data input operation	Read-out	Remark
	MODE 1		
1	PO	0.	
2	(a) 0 EXE	0.	
3	(b) 2 EXE	0.	
4	(ϵ) 0.00001 EXE	–	
5		0.99999237	(x)
6			
7			
8			
9			
10			

Step	Data input operation	Read-out	Remark
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Program for Solving an equation by the midpoint method

Transfer		Program		Remark	No. of steps
	/	MODE, 2, (Not included in No. of steps)			
	1	PO	AC, HLT, Min 1, AC, HLT, Min 2, AC, HLT, Min F,		
	2	LBL 1,	MR 2, −, MR 1, =, INV ABS, INV $x \geqq$ F, GoTo 2, MR 3, HLT,		
	3	LBL 2,	((, MR 1, +, MR 2,)), ÷, 2, =, Min 3, GSB P1,		
	4		INV $x \geqq 0$, GoTo 3, MR 3, Min 1, GoTo 1,		
	5	LBL 3,	MR 3, Min 2, GoTo 1,		39
	6				
	7	P1	MR 3, ×, MR 3, ×, MR 3, +, MR 3, ×, MR 3, −, MR 3,		
	8		−, 1, =,		14
	9				
	10			Total	55
	11				
	12				
	13				
	14				
	15				
	16				
	17				
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	20				
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	22				
	23				
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	26				
	27				
	28				
	29				

Note

When writing the subroutine of $f(x)$, do not use x^y if $f(x) = 0$ has a negative root.

Contents in memories

0		·0	
1	a	·1	
2	b	·2	
3	c	·3	
4		·4	
5		·5	
6		·6	
7		·7	
8		·8	
9		·9	
F	ϵ	·F	