Lab Module #2

ECMS

Course schedule

Mon	Tue	Wed	Thu	Fri	Sat	Sun	
24	25	26	27	28	1	2	March
3	4	5	6	7	8	9	
10	11	12	13	14	15	16	
17	18	19	20	21	22	23	
24	25	26	27	28	29	30	
31	1	2	3	4	5	6	April
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	1	2	3	4	May
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	
26	27	28	29	30	31	1	June
2	3	4	5	6	7	8	
9	10	11	12	13	14	15	

Lab 1

Lab 2

Lab 3

Lab 4

Lecture

Lab report due

Class hours

Monday

11:30 - 14:30, Room 04AM

Thursday

Class A: 10:00 - 11:30, Room 02AM

Class B: 11:30 - 13:00, Room 02AM

Tuesday, April 29th

To be confirmed

Contacts

Lectures & lead instructor

Ezio Spessa ezio.spessa@polito.it

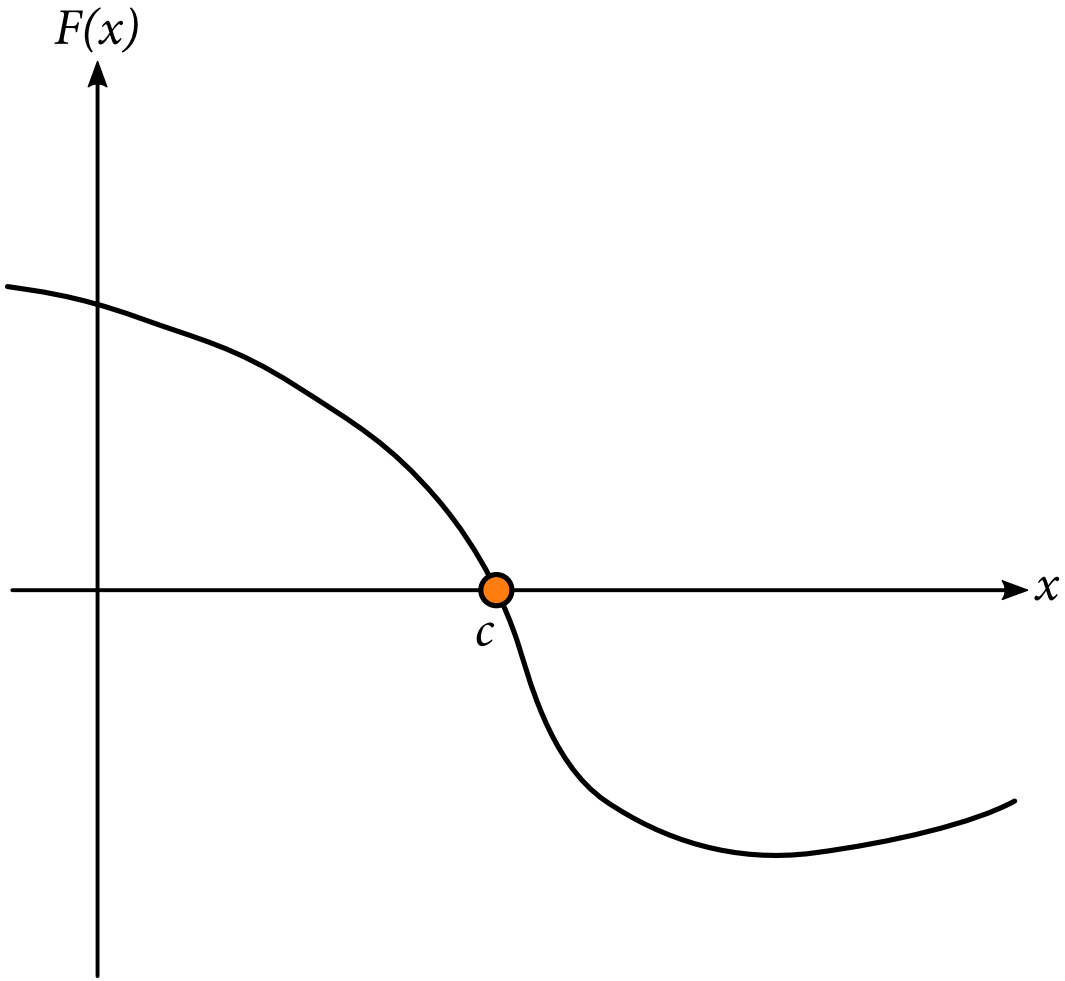
Lab Class A

Teacher: Federico Miretti federico.miretti@polito.it

Lab Class B

Teacher: Trentalessandro Costantino trentalessandro.costantino@polito.it

Bisection algorithm



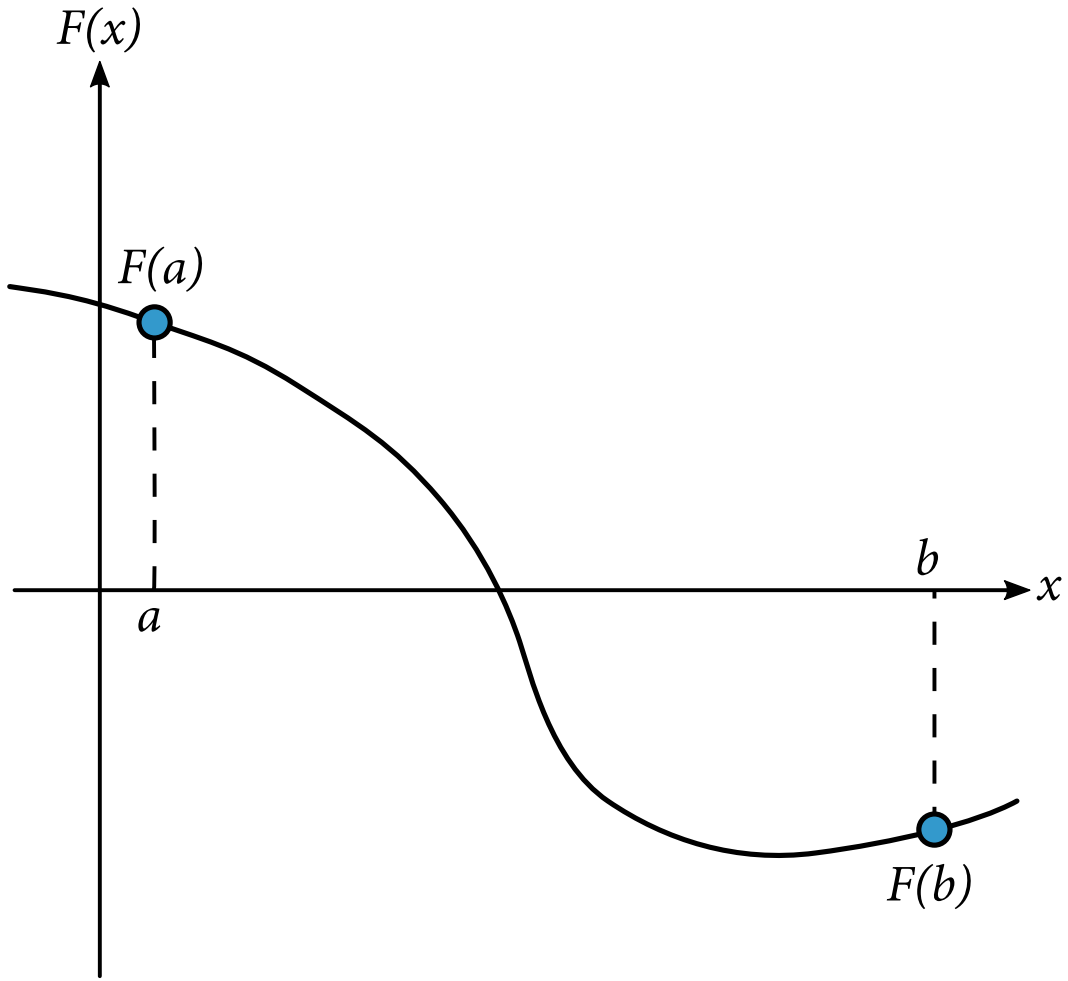
Goal

Given a function $F(x)$, find x for which $F(x) = 0$.

In our implementation,

- Our variable will be the equivalence factor s.
- Our function $F(s)$ will be the final SOC deviation $\sigma(t_f) - \sigma(t_0)$.

Bisection algorithm

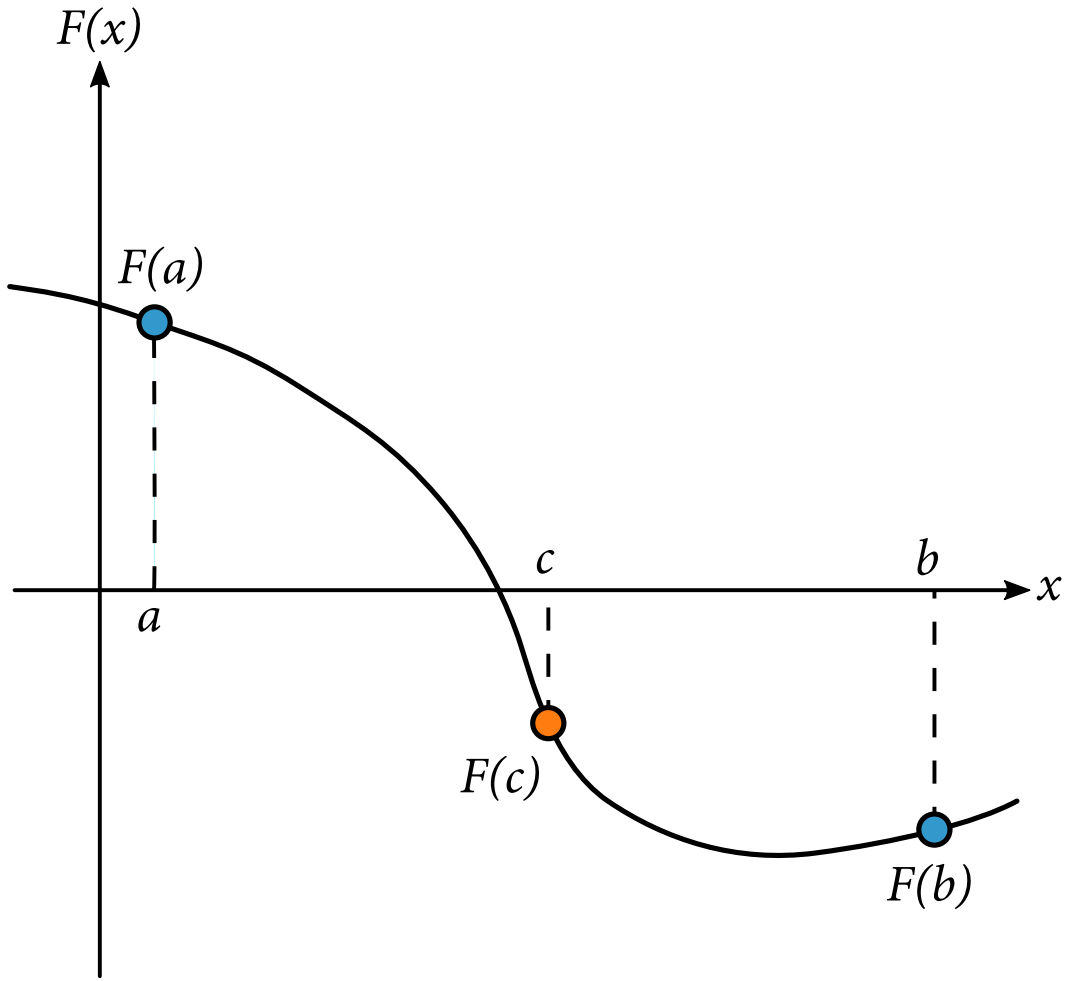


Algorithm outline

Given a function $F(x)$, find x for which $F(x) = 0$.

1. Guess an interval $[a_1, b_1]$ for which $F(a_1)$ and $F(b_1)$ have opposite signs.

Bisection algorithm

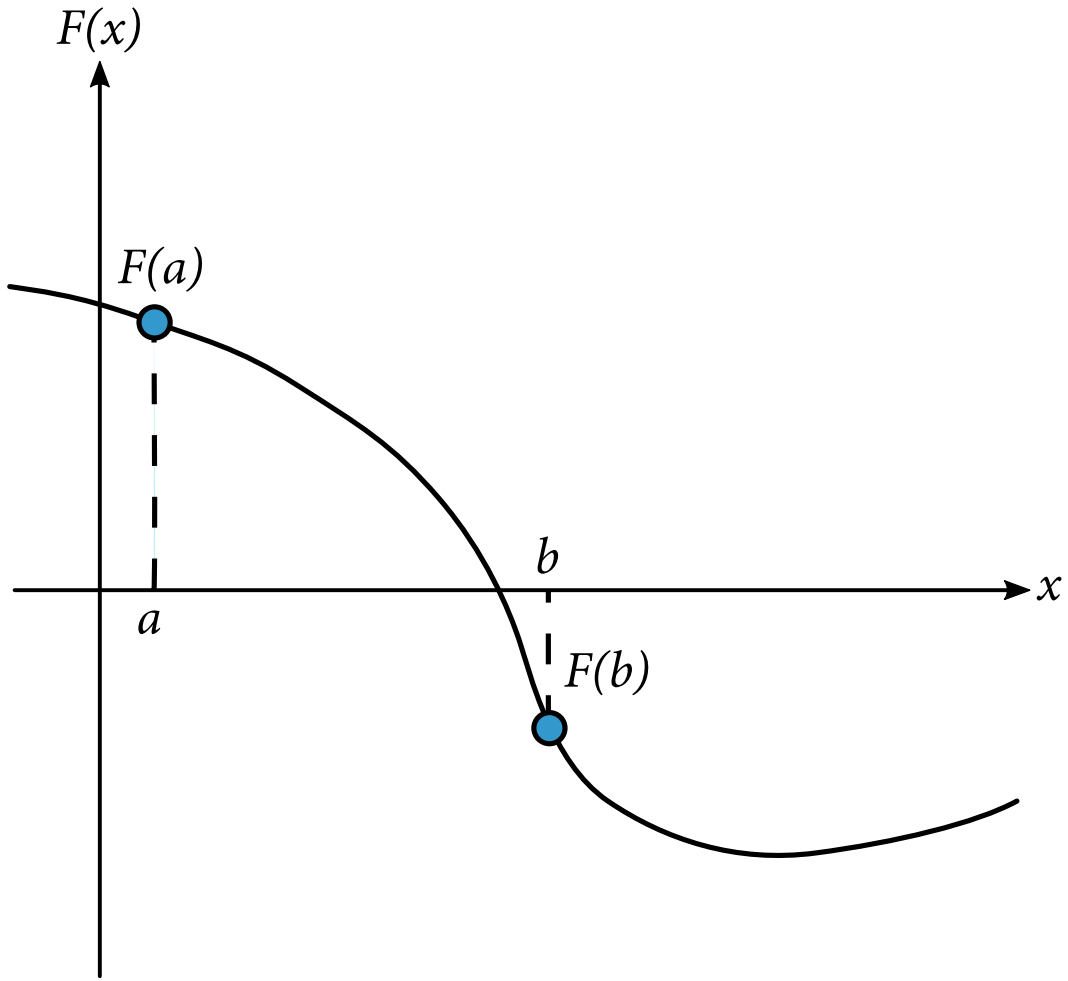


Algorithm outline

Given a function $F(x)$, find x for which $F(x) = 0$.

1. Guess an interval $[a, b]$ for which $F(a)$ and $F(b_1)$ have opposite signs.
2. Evaluate F at the interval midpoint c (i.e. $F(c)$).
3. If $F(c) \approx 0$, terminate; else,

Bisection algorithm



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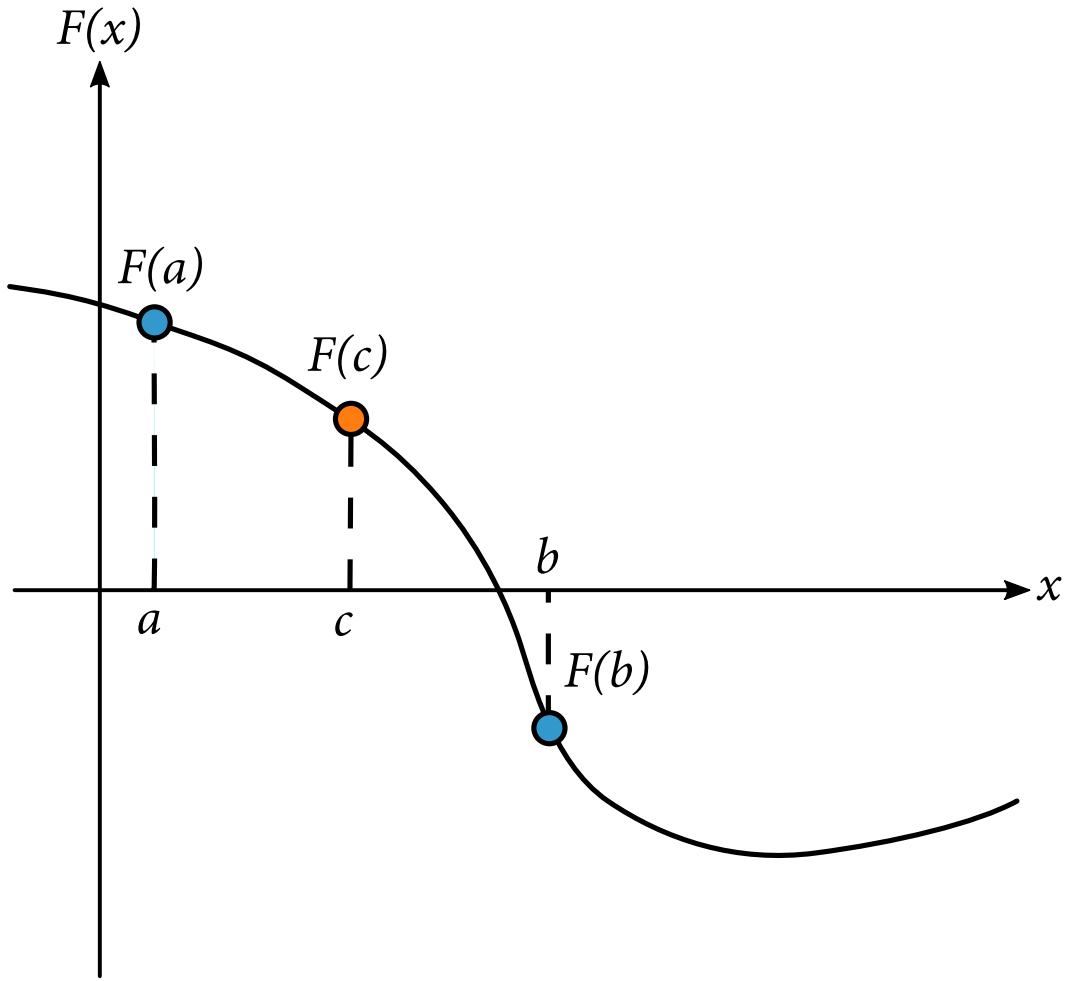
3. If $F(c) \approx 0$, terminate; else,
4. Examine the sign of $F(c)$. Replace either a or b with c.
5. Go to 2.

Bisection algorithm



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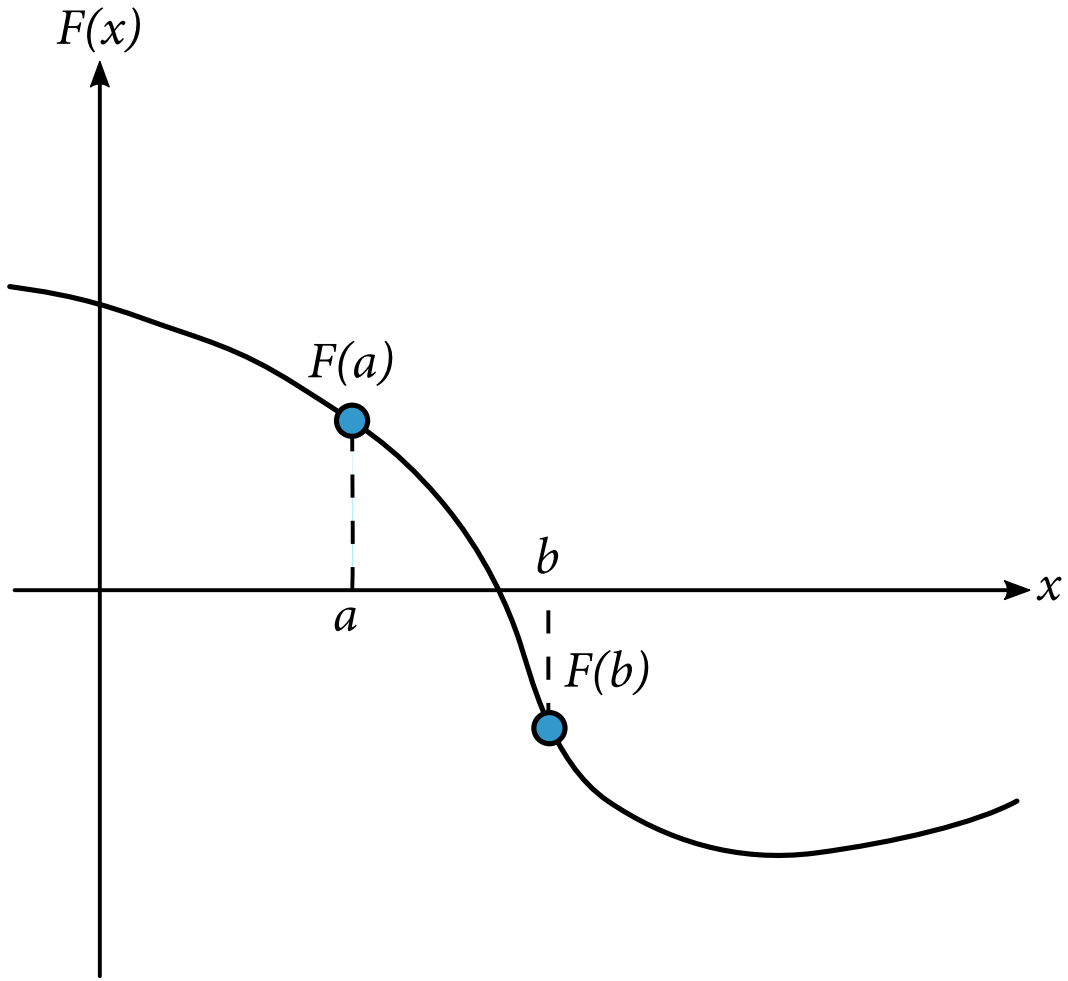

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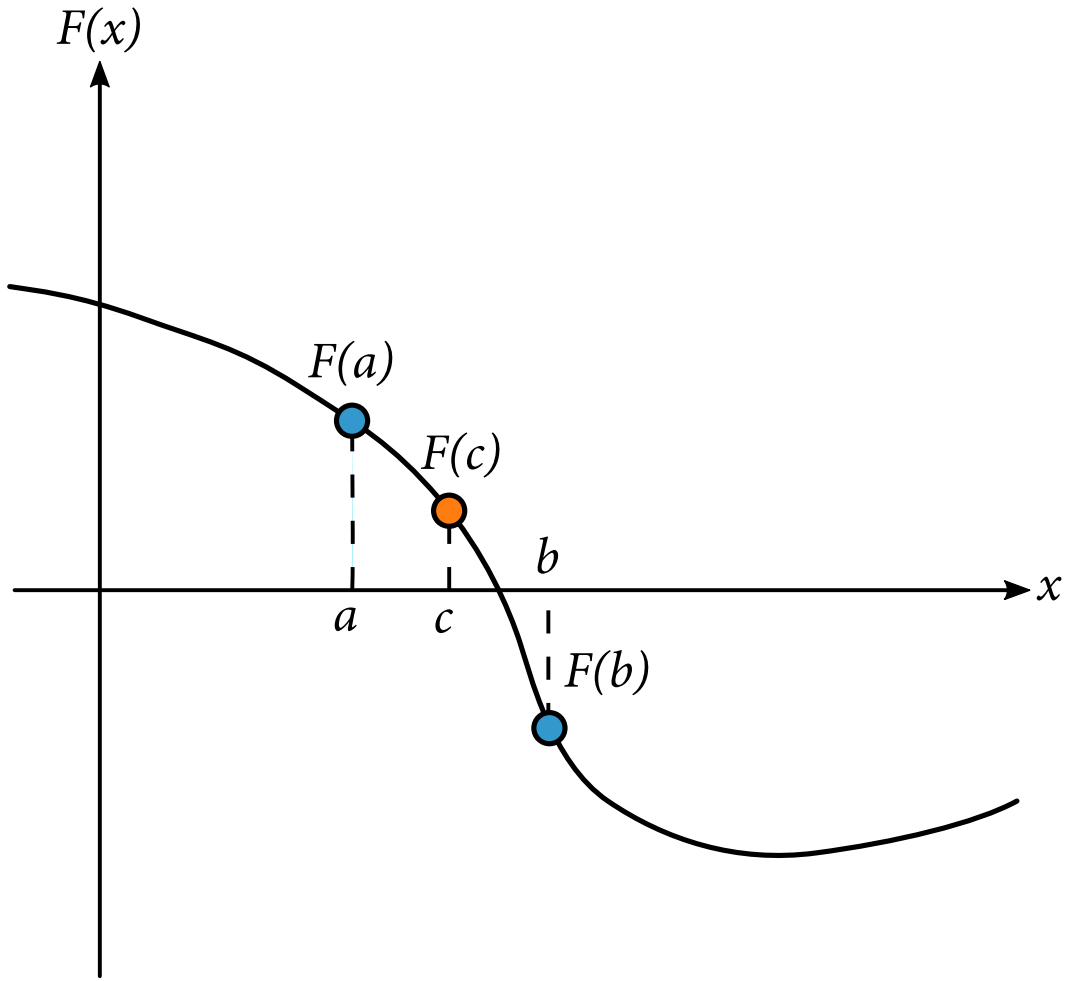

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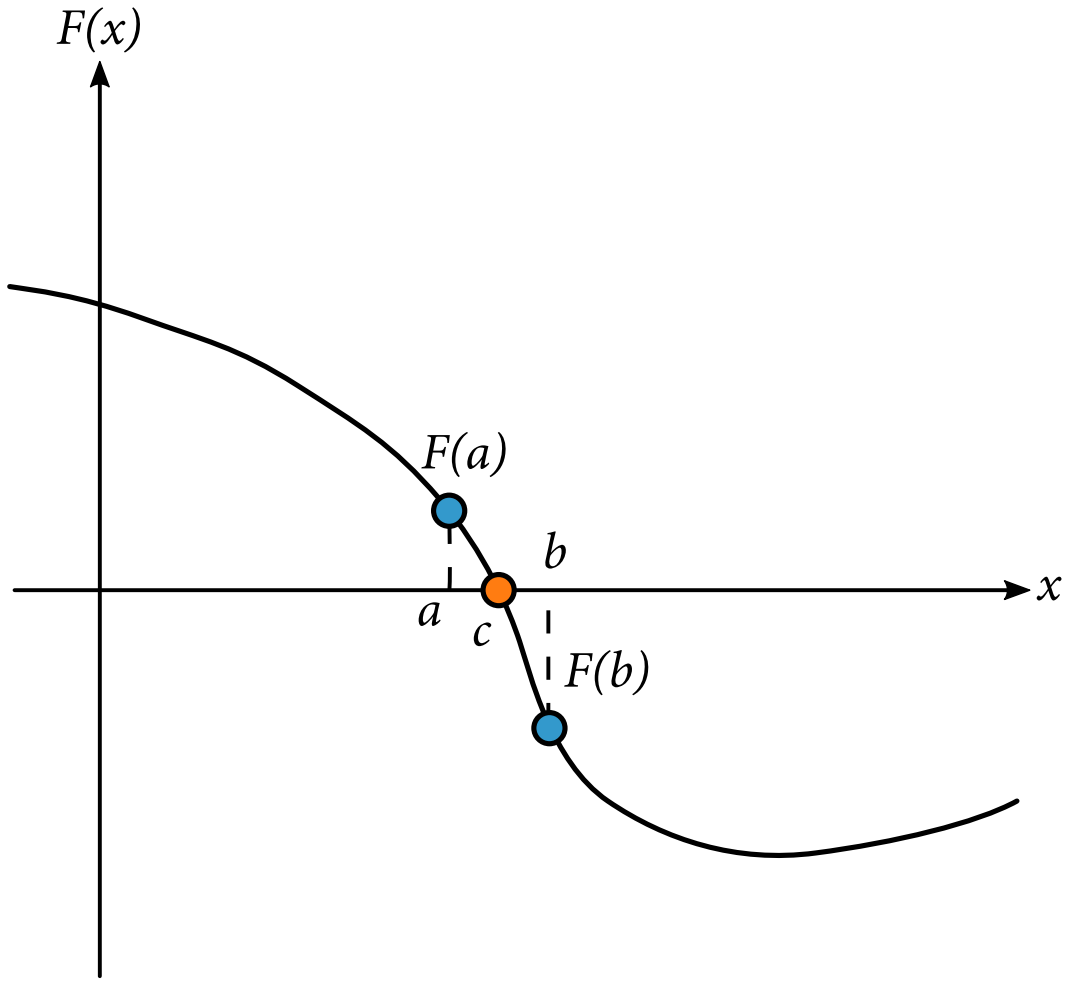

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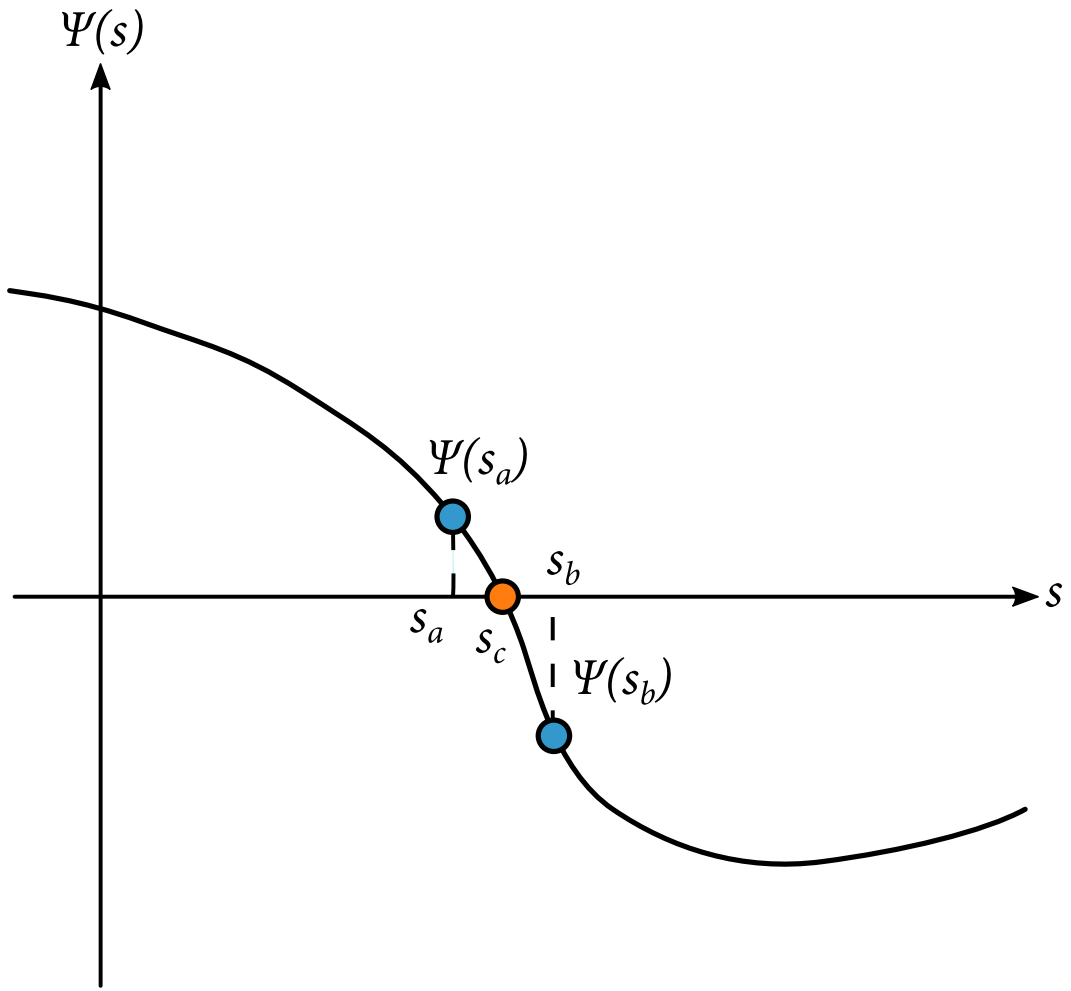

Calibrating the ECMS

- Our variable is the equivalence factor s
- Our function $F(s)$ is the final SOC deviation: $\Psi(s) = \sigma(t_f) - \sigma(t_0)$.
- Evaluating a $\Psi(s)$ means to run a whole simulation with the ECMS with a certain s.

Tip

- Wrap a simulation loop in a function which takes s as input and returns $\sigma_f - \sigma_0$. This is your $\Psi(s)$.