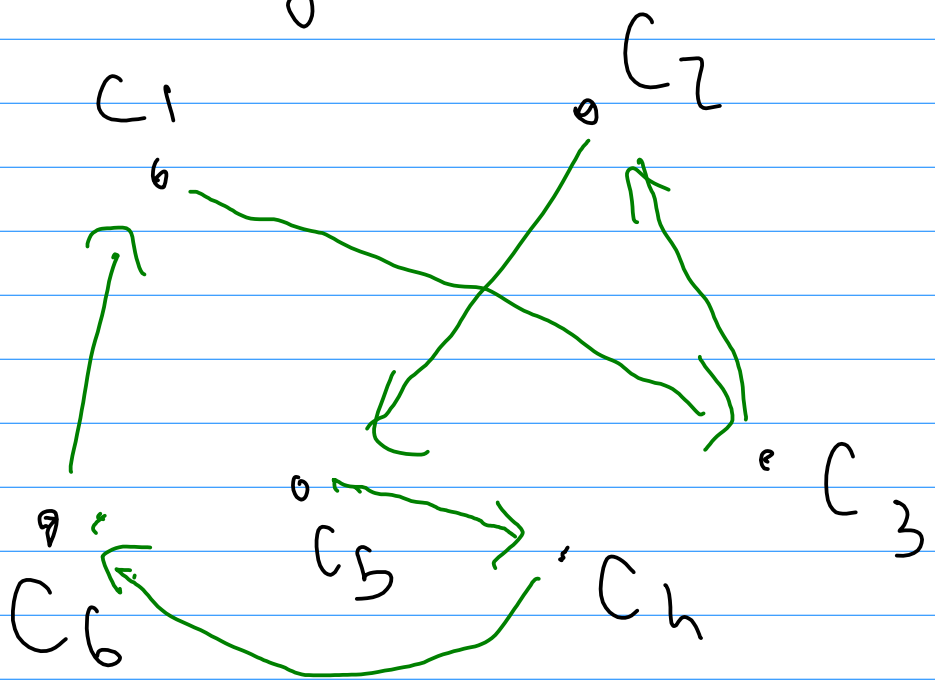
Curs 7

Traveling Salesman



Variabile: circuit → permutări → spațiu discret

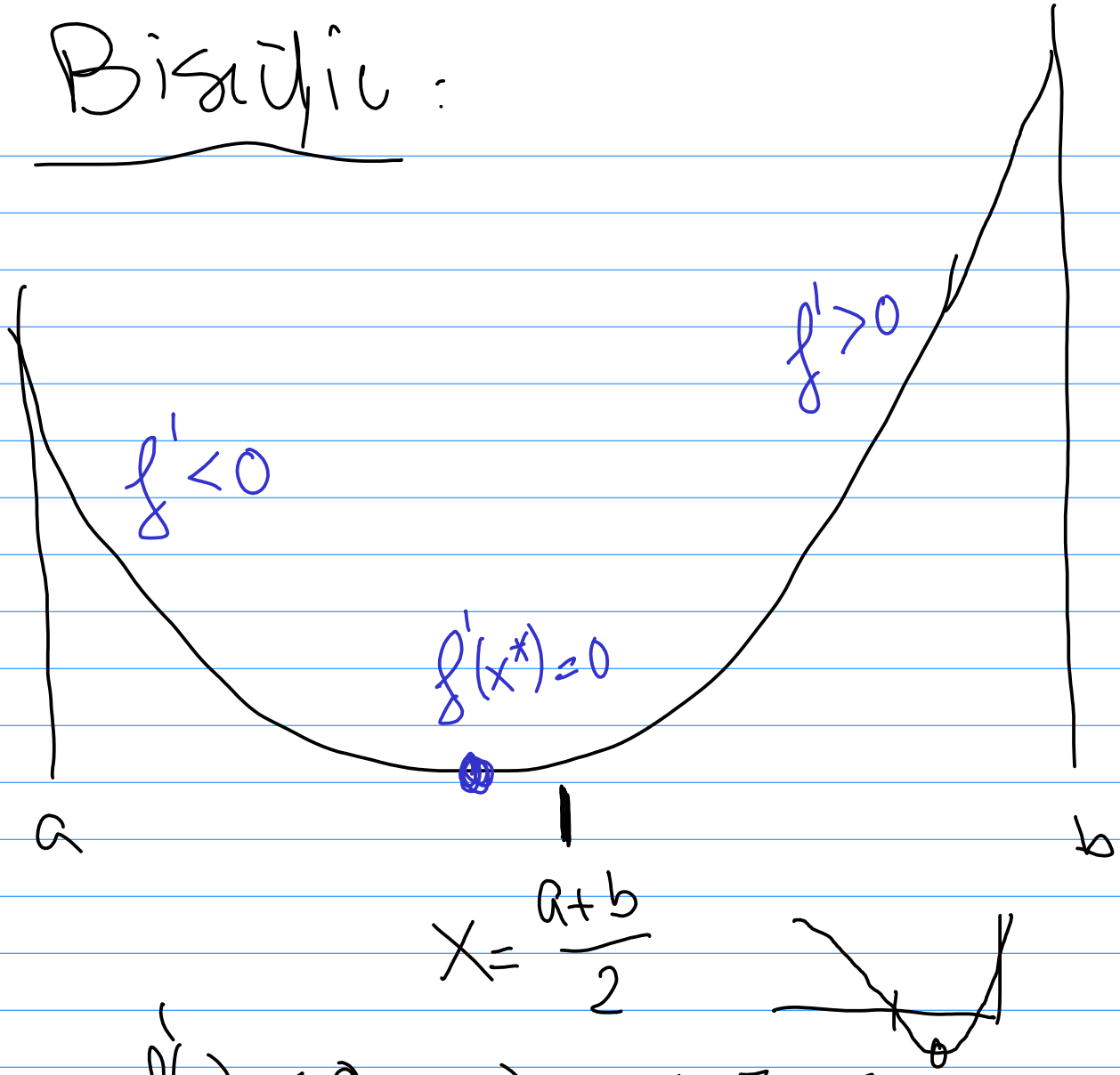
$1 \to 3 \to 2 \to 5 \to 4 \to 6 (\to 1)$

$1 \to 4 \to 3 \to 2 \to 5 \to 6$

flip

2 4

Bisecție:



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

Dacă $f'(x) < 0 \Rightarrow x^* \in [x, b]$

$f'(x) \geq 0 \Rightarrow x^* \in [a, x]$

O singură evaluare de derivată/iter

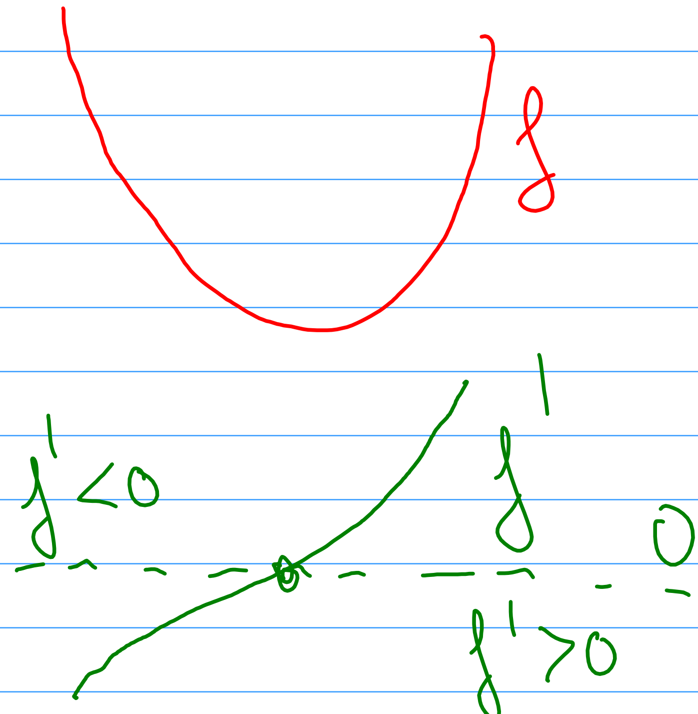
Ordin convergență $|S_{i+1}| = \frac{1}{2}|S_i|$

Conv liniară: $error_{i+1} \le c \cdot error_i$

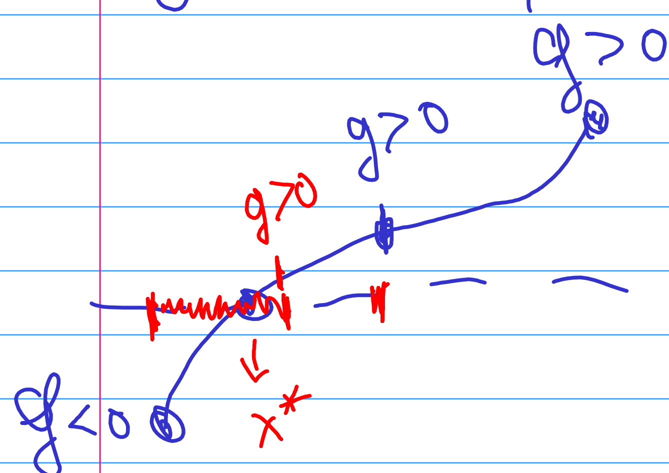
$c \in (0,1)$

$\forall\, c \in (0,1)$

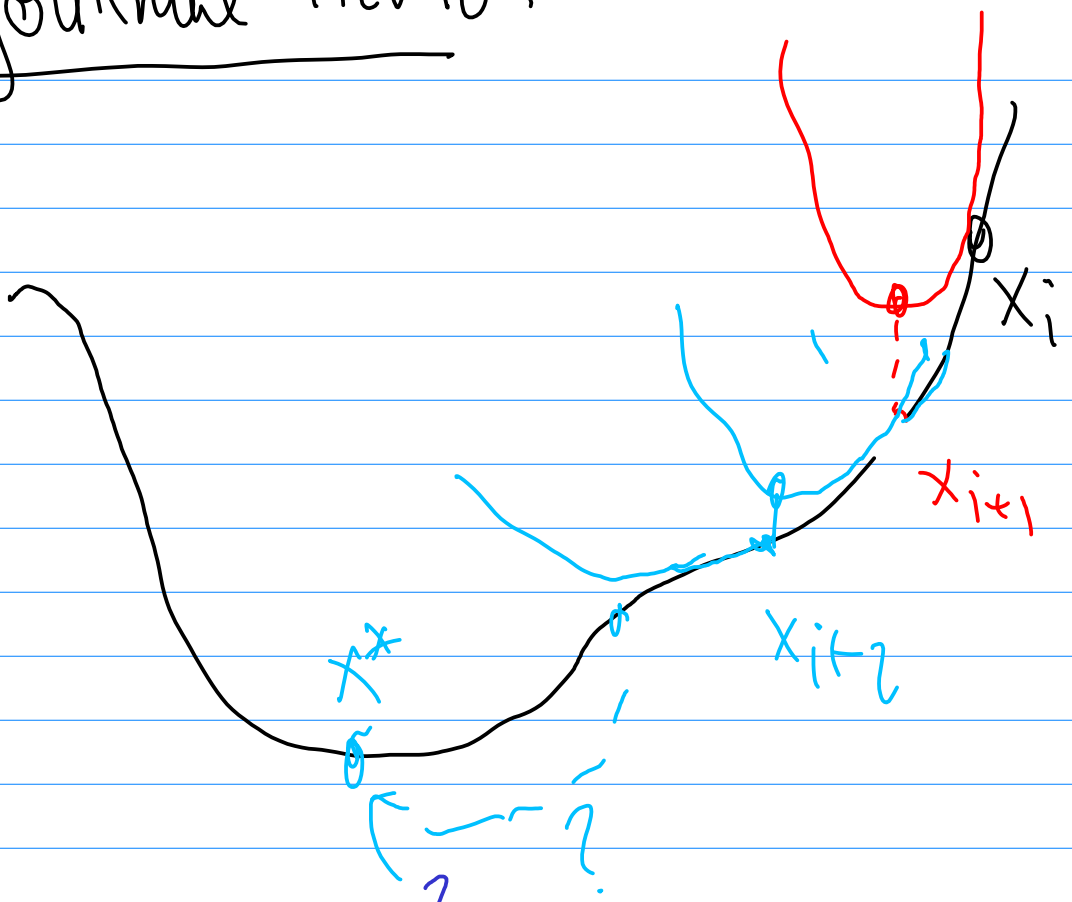
Conv superliniară: $\frac{error_{i+1}}{error_i} \to 0$



Alg de bisecție ⟺ căutare a unui zero pt o funcție cresc/descresc (dihotomie)



Algoritmul Newton



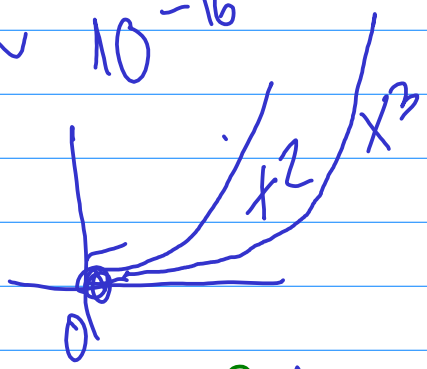
$$err_{i+1} \leq C \, err_i^2$$

$$err_i = 10^{-2} \Rightarrow err_{i+1} \sim 10^{-4}$$

$$err_{i+2} \sim 10^{-8}$$

$$err_{i+3} \sim 10^{-16}$$

$$err_{i+1} \simeq C \, err_i^p$$

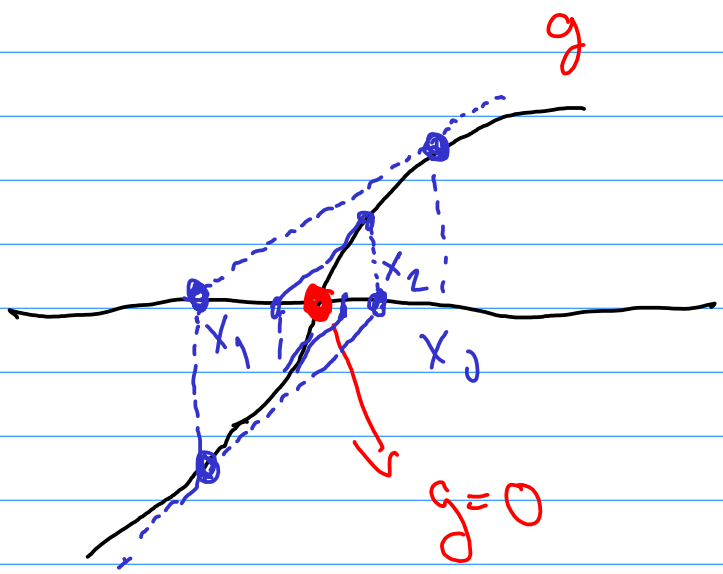


Aplicăm log: $\log err_{i+1} \simeq \log C + p \log err_i$

Alg Newton pentru căutare unui 0

$g = f'$

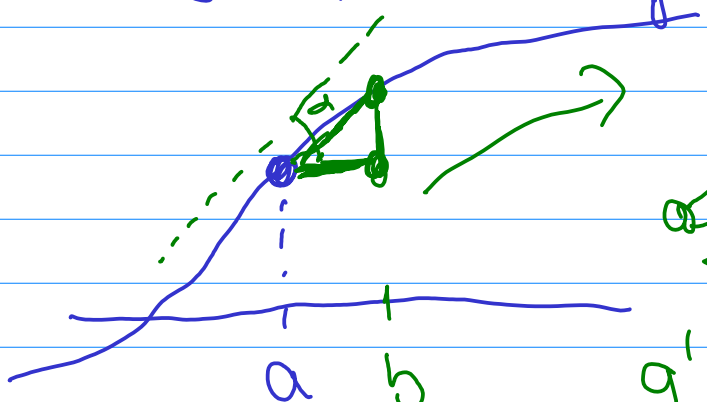
- desenăm tangenta la graficul lui g și o intersectăm cu $\{y=0\}$
- obținem punctul următor.

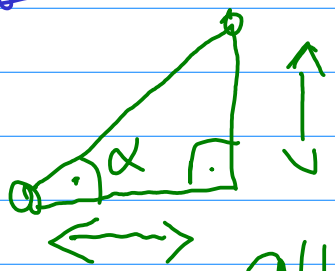


- dacă pornim aproape de soluție
⇒ convergență rapidă în anumite situații.

Raport dif. finite:

$g'(a) = ?$





$$g'(a) \approx \frac{g(b)-g(a)}{b-a}$$