7-4. NEHOMOGENE LDJ 3 KK

-sada nješavamo Ly=f(x), već smo dokorali y=yn+gp

741 Metoda varijacije konstanti

1) resimo pripadnu HLDJ Ly=0 - yn=e,y,+...+inyn

2) vaniramo konstante $C_i \rightarrow C_i(x) = 0$ opcé $y = C_i(x)y_1 + \cdots + C_n(x)y_n$ 3) treba odrediti $C_i(x) = 0$ $C_n(x) = 0$

- gradimo sustant o n nepoznamica ovage je mnoverge

La deriv umnosta

2009 derivacje umnoska 10 izgleda:

 $y' = \sum_{i=1}^{n} C_i(x) y_i(x) + \sum_{i=1}^{n} C_i(x) \cdot y_i(x)$ unotimo u poèdnu LD] y"+ any"+ ... + ay + any = for

f(x)+ \sum_{i=1}^{n} C; (x) \left[y_i^n + a_{n-1}y_i^{n+1} + ... + oy_i' + a_{oy}']

=> $C_1'(x),...,C_n'(x)=?$

fer nu y: nescuja hom.

 $y'' = \sum_{i=1}^{n} C_i(x) y(x) + \sum_{i=1}^{n} C_i(x) y_i''(x)$

y (n) = \(\sum_{\infty}^{\infty} \chi_{\infty}^{\infty} \chi_{\inft

-dobili smo sustan:

ci(x)y,+(2'(x)y2+...+Cn'(x)yn=0

C1(x) y, + C2(x) y2 + ... + Cn (x) yn = 0

 $C_1(x)y_1^{(n-1)} + C_2(x)y_2^{(n-1)} + \cdots + C_n(x)y_n^{(n-1)} = f(x)$ Determinanta ovoj nehomojenoj sustava je Wronský ana (41)... yn).
Budući de su y1 do yn njesanja HLDJ eni su linearno ruzanismi

f(x) = f(x)

Det to pa je matrica regularra i ima jedinstveno rijerenje => Ci(x)... Cn(x) su jednoznačno odredeve pa se Ci(x) dolrje inkegriranjem

Opée njesenge:

y= lu (1 =) + (-x +D2) sinx + (-lu(sinx)) conx

y-lu(1差)-x-Sinx-lu(sinx)cosx-D=yn+yp

yn -> D, +D, Sinx + D, asx -> homogens +lu (to 2) -xsnx - luisinx florix

r2 - 2r +1-0

2) y= C((x) ex + C((x) xe*

 $= \frac{c_1(x)c^{x} + C_2(x)xe^{x}}{-C_1(x)e^{x} + C_2(x)(1e^{x} + xe^{x})} = \frac{-c}{x^2}$

Y,(1): 0 -> D(C+DE+0+0=0

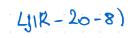
y (1) =0 => Die + Dz2e+e+0 + =0

 $-C_2(x) = \frac{1}{x^2} \longrightarrow c_2(x) = \int -\frac{1}{x^2} dx = \frac{1}{x} + D2$

opée quoein: 9=(lu(x) +D)ex + (1+D2)xx

h= D1ex +D2 xex + lu |x| ex + ex 1 poceum ungit

y'= D1ex + D2 (xcx+ex) + = ex + Rulx ex+ex





















































 $C^{12} = 1 \quad (6 = 5)$

yh = C, ex +C2 Xex

 $C'_{i}(x) = \frac{1}{x}$

C1 (x) - Cu (x) + D1

1 Dz = -1

177











