⑦

Transformăm ecuația:

$$t^3 y''' = 5t^3 \ln t + 9t^3 + t^2 y'' - 3t y' + 4y$$

$u_1 = y;$

$u_2 = y'$

$u_3 = y''$

Scriem funcțiile:

function [f_1 f_2 f_3 u_{10} u_{20} u_{30} a b l] = fct()

$u_{10} = 0;$

$u_{20} = 1;$

$u_{30} = 3;$

$a = 1;$

$b = 2;$

$h = 0.1;$

$f_1 = @(t, u_1, u_2, u_3) \ u_2;$

$f_2 = @(t, u_1, u_2, u_3) \ u_3;$

$f_3 = @(t, u_1, u_2, u_3) \ 5*t^3 * \log(t) + 9*t^3 + t^2 * u_3$
$-3*t* u_2 + 4* u_1;$

endfunction

m, n));

iau eliminate.

Funcția este una ajutătoare, iar ecuația este rezolvată de:

```
function y = RK4 ( f1, f2, f3, u10, u20, u30aa, b, h)

    u1(1) = u10;
    u2(1) = u20;
    u3(1) = u30;

    t = a : h : b

    n = length(t)-1;

    % acum vom începe rezolvarea propriu zisă.

    for i = 1 : n

      K11 = h * feval (f1, t(i), u1(i), u2(i), u3(i));

      K21 = h * feval ( f2, t(i), u1(i), u2(i), u3(i));
      K31 = h * feval ( f3, t(i), u1(i), u2(i), u3(i));

      K7 = h * feval( f1  t(i)+h/2, u1(i) + K11/2, u2(i) + K21/2, ...
      u3(i) + K31/2);

      K22 = h * feval(f2, t(i)+h/2, u1(i)+K11/2, u2(i)+K21/2, u3(i)+K31/2);

      K32 = h * feval(f3, t(i)+h/2, u1(i)+K11/2, u2(i)+K21/2, u3(i)+K31/2);
      K13 = h * feval(f1, t(i)+h/2, u1(i)+K12/2, u2(i)+K22/2, u3(i)+K32/2);
      K23 = h * feval( f2, t(i)+h/2, u1(i)+K12/2, u2(i)+K22/2, u3(i)+K32/2);
      K33 = h * feval( f3, t(i)+h/2, u1(i)+K12/2, u2(i)+K22/2, u3(i)+K32/2);
      K14 = h * feval( f1, t(i)+h, u1(i)+K13, u2(i)+K23, u3(i)+K33);
      K24 = h * feval(f2, t(i)+h, u1(i)+K13, u2(i)+K23, u3(i)+K33);
      K34 = h * feval(f3, t(i)+h, u1(i)+K13, u2(i)+K23, u3(i)+K33);
```