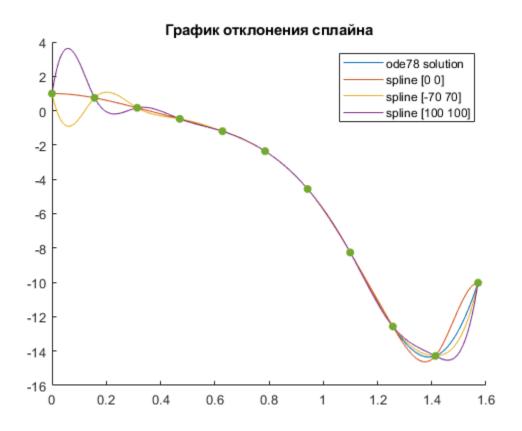
```
% ###### ##### #### ## ######
% ####### p = k/5 = 20/5 = 4
p = 4;
tspan = [0 2*pi/p];
% ######## ####### ######:
u01 = [1 \ 0];
options = odeset('RelTol',1e-0,'AbsTol',1e-3,'MaxStep', 0.05);
% ### ##### ####### #####:
[t,u] = ode78(@(t,u)matie(t,u,p), tspan, u01, options);
8 ####### ## ######### ######### ##### ## 11 #####
N = 10;
x = linspace(0, 2*pi/p, 200);
xval = linspace(0, 2*pi/p, N+1);
% ####### ####### # ########
[t_N,yval] = ode78(@(t,u)matie(t,u,p), xval, u01, options);
yval = yval(:,1).';
% ######################
h = diff(xval);
% ###### ##### # #####
lam = h(2:end)./(h(1:end-1) + h(2:end));
mu = 1 - lam;
% ####### ##### C
C = 3*lam.*(yval(2:end-1) - yval(1:end-2))./(h(1:end-1)) +...
   3*mu.*(yval(3:end) - yval(2:end-1))./(h(2:end));
% ####### ###### #######
A = 2*eye(N+1) + diag([0,mu].*ones(1,N), 1) + diag([lam,0].*ones(1,N), -1);
A(1,1) = 1; A(end,end) = 1;
% ######################
C 1 = [0; C.'; 0];
C 2 = [-70; C.'; 70];
C_3 = [100; C.'; 100];
m 1 = A \setminus C 1;
m_2 = A\C_2;
m 3 = A \setminus C 3;
S 1 = zeros(size(x));
S_2 = zeros(size(x));
S_3 = zeros(size(x));
for k = 1 : N
   ind = x >= xval(k) & x < xval(k+1);
   if k == N
       ind = x >= xval(k) & x <= xval(k+1);
       int = x \ge xval(k) & x < xval(k+1);
   end
   xx = x(ind);
```

```
S_1(ind) = hermit_interpolation(xval(k), xval(k+1), [yval(k), m_1(k),
    yval(k+1), m 1(k+1)], xx);
                 S_2(ind) = hermit_interpolation(xval(k), xval(k+1), [yval(k), m_2(k), m_2(k)
    yval(k+1), m_2(k+1)], xx);
                 S_3(ind) = hermit_interpolation(xval(k), xval(k+1), [yval(k), m_3(k),
   yval(k+1), m_3(k+1)], xx);
end
figure(1);
hold on;
plot(t,u(:,1));
plot(x, S 1);
plot(x, S_2);
plot(x, S_3);
scatter(xval, yval, 'fill');
hold off;
legend('ode78 solution', 'spline [0 0]', 'spline [-70 70]', 'spline [100
  100]');
title('##### ######## #####');
```



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