

```

clear all
clc
close all
format short

% SPLINES

x = [-2 -1 1 2 3 4]
fx = [-10 -10 10.5 9.75 10 10]

plot(x,fx,'o','MarkerEdgeColor','k',...
      'MarkerFaceColor','k',...
      'MarkerSize',10)
xlabel('Tempo (s)'); ylabel('Tensão (V)'); hold on

%Comparação com funções nativas!
P = polyfit(x,fx,3) %ajusta por mínimos quadrados um polinômio de n grau
xp = linspace(min(x),max(x),100);
ss = polyval(P,xp);
plot(xp,ss,'k:','LineWidth',2), hold on
grid on
P = polyfit(x,fx,5) %ajusta por mínimos quadrados um polinômio de n grau
xp = linspace(min(x),max(x),100);
ss = polyval(P,xp);
plot(xp,ss,'k-.','LineWidth',2), hold on
grid on
yy = interp1(x,fx,xp,'spline');
plot(xp,yy,'k--','LineWidth',4), hold on

yy = interp1(x,fx,xp,'pchip');
plot(xp,yy,'k','LineWidth',2)

for i=1:(length(x)-1)
    h(i)=x(i+1)-x(i);
    p(i)=(fx(i+1)-fx(i))/(x(i+1)-x(i));
end

A = [1 0 0 0 0 0;
     h(1) 2*(h(1)+h(2)) h(2) 0 0 0;
     0 h(2) 2*(h(2)+h(3)) h(3) 0 0;
     0 0 h(3) 2*(h(3)+h(4)) h(4) 0;
     0 0 0 h(4) 2*(h(4)+h(5)) h(5);
     0 0 0 0 0 1]

pp = [0 3*(p(2)-p(1)) 3*(p(3)-p(2)) 3*(p(4)-p(3)) 3*(p(5)-p(4)) 0]'

c = pp\A

for i=1:(length(x)-1)
    d(i)=(c(i+1)-c(i))/3*h(i);
    b(i)=((fx(i+1)-fx(i))/h(i))-(h(i)/3)*(2*(c(i))+c(i+1)));
end
d
b

```