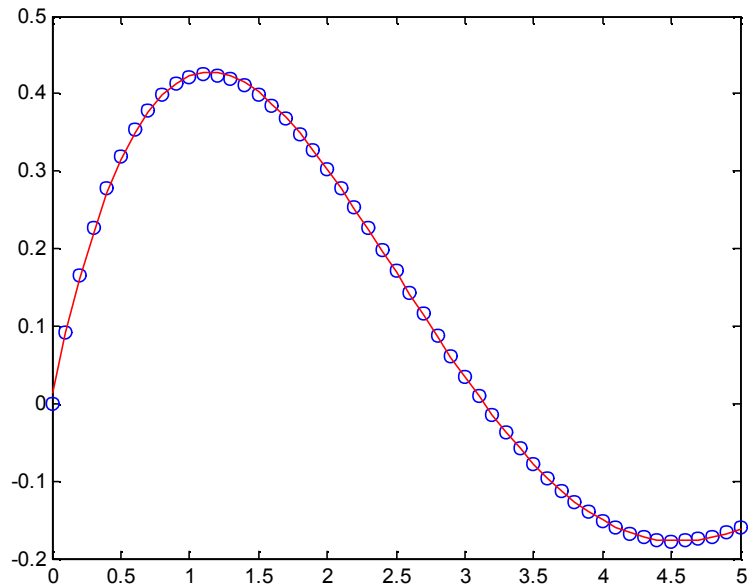
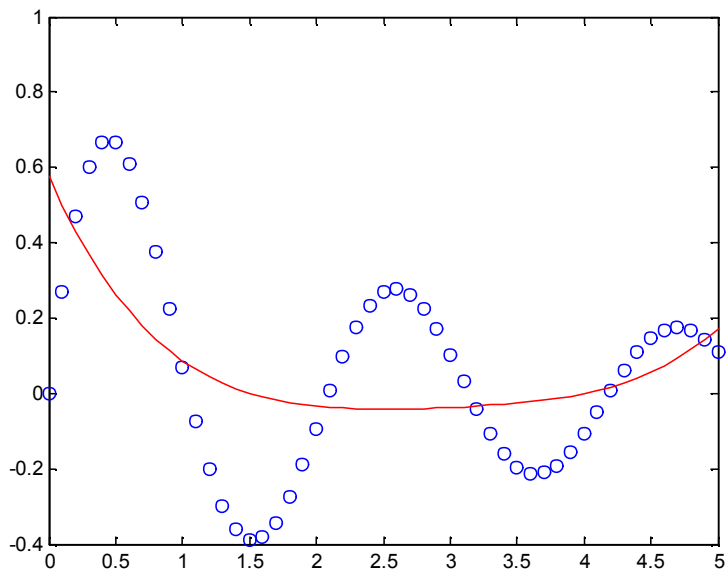


תרגיל כיתה 6

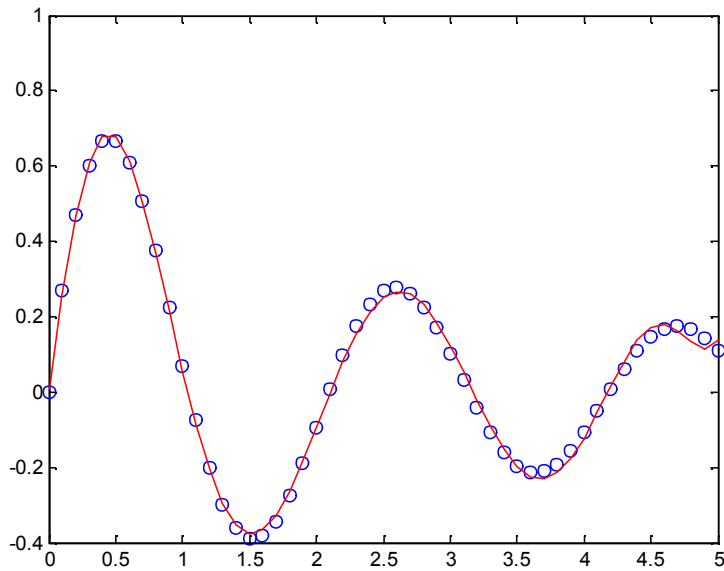
```
x = (0: 0.1: 5)';  
y=sin(x)./(1+x); p = polyfit(x,y,4); f = polyval(p,x); plot(x,y,'o',x,f,'-r')
```



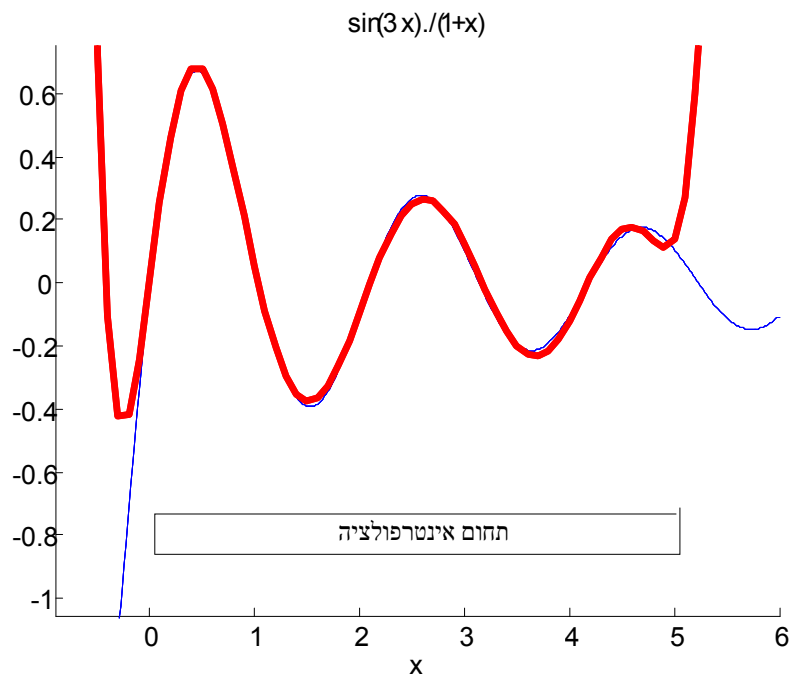
```
y=sin(3*x)./(1+x); p = polyfit(x,y,4); f = polyval(p,x); plot(x,y,'o',x,f,'-r')
```



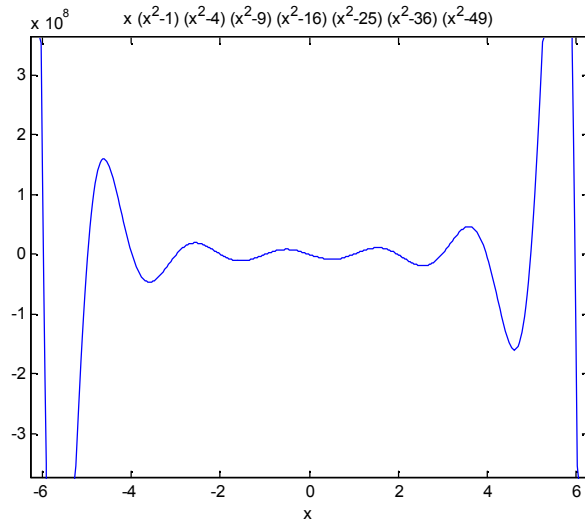
```
p = polyfit(x,y,8); f = polyval(p,x); plot(x,y,'o',x,f,'-r')
```



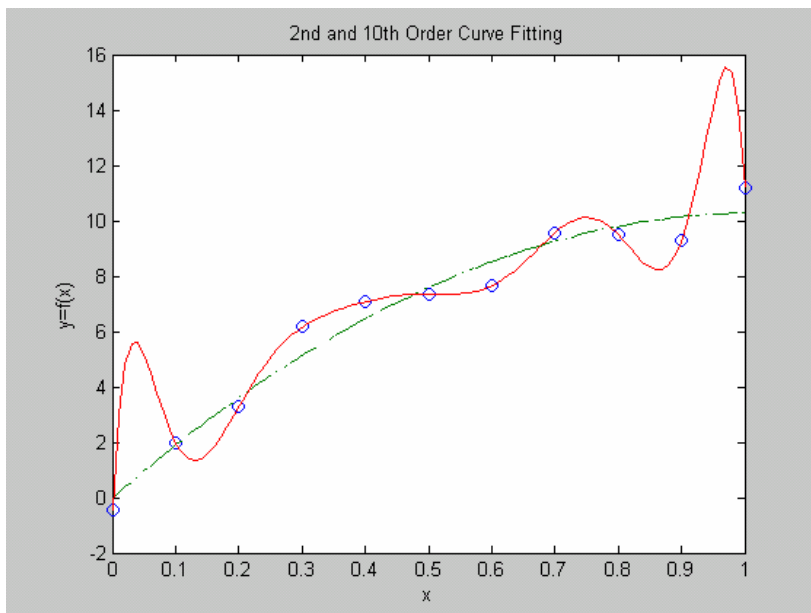
```
hold on;  
ezplot('sin(3*x)./(1+x)',[-0.9 6]);  
xx=-2:0.1:7; yy=polyval(p,xx); plot(xx,yy, 'r','LineWidth',3);
```



```
ezplot('x*(x^2-1)*(x^2-4)*(x^2-9)*(x^2-16)*(x^2-25)*(x^2-36)*(x^2-49)')
```



```
x = [0 .1 .2 .3 .4 .5 .6 .7 .8 .9 1];
y = [-.447 1.978 3.28 6.16 7.08 7.34 7.66 9.56 9.48
9.30 11.2];
p = polyfit(x,y,2);
xi = linspace(0,1,100);
yi = polyval(p,xi);
pp = polyfit(x,y,10);
y10 = polyval(pp,xi);
plot(x,y,'o',xi,yi,'--',xi,y10)
xlabel('x'), ylabel('y=f(x)')
title('2nd and 10th Order Curve Fitting')
```



```

% interpolation

s=interp1(x,y,x0 , 'linear')
% linear interpolation

s=interp1(x,y,x0 , 'cubic')
% cubic interpolation

s=interp1(x,y,x0 , 'spline')
% cubic spline interpolation

s=interp1(x,y,x0 , 'nearest')
% nearest neighbor interpolation

```

```

% Create N Chebyshev nodes
N = 21
k = 0:N-1;
x = cos( (pi*(N-k-0.5))/N);
y = exp(x);

for i = 1:N
    % the polynomial whose roots are all the values of X except this one
    pp = poly(x( 1:N) ~= i));
    % scale with correspondes to Lagrange formula
    pvals(i,:) = pp ./ polyval(pp, x(i));
end
% the final polynomial
PN = y*pvals;
xi = [-1:0.01:1];
yi = polyval(PN,xi);
zi = exp(xi);
hi = abs(zi-yi);

subplot(1,2,1); plot(xi,yi,'g',xi,zi,'r--',x,y,'o');
grid;
legend('P_n(x)', 'f(x)', 'Chebyshev nodes', 'Location', 'NorthWest');
subplot(1,2,2); plot(xi,hi,'r');
legend('Interpolation error');

```

