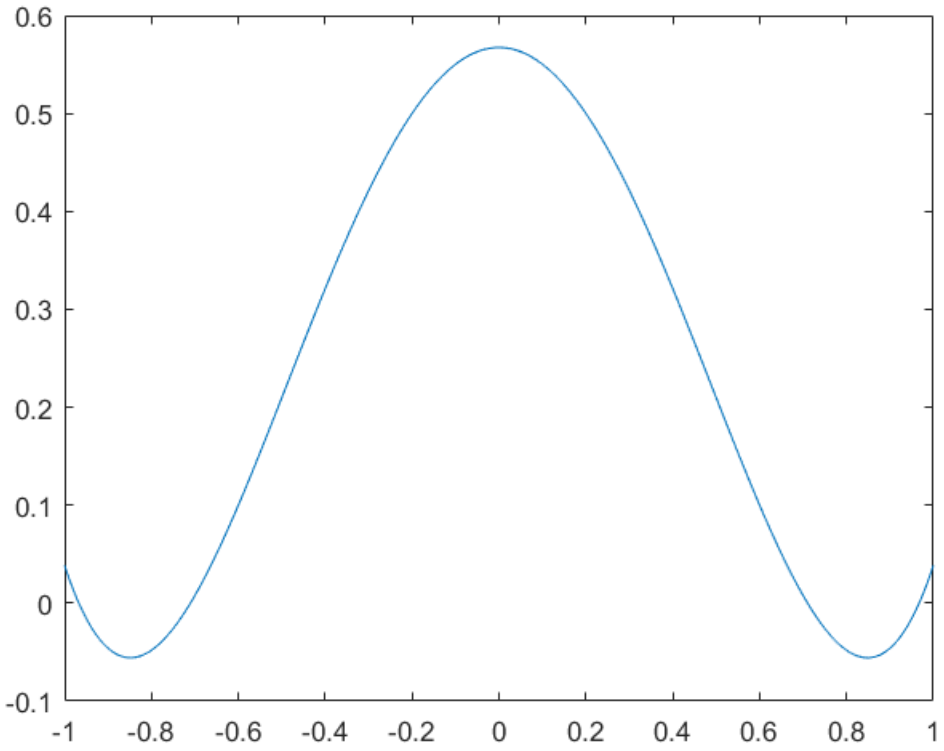
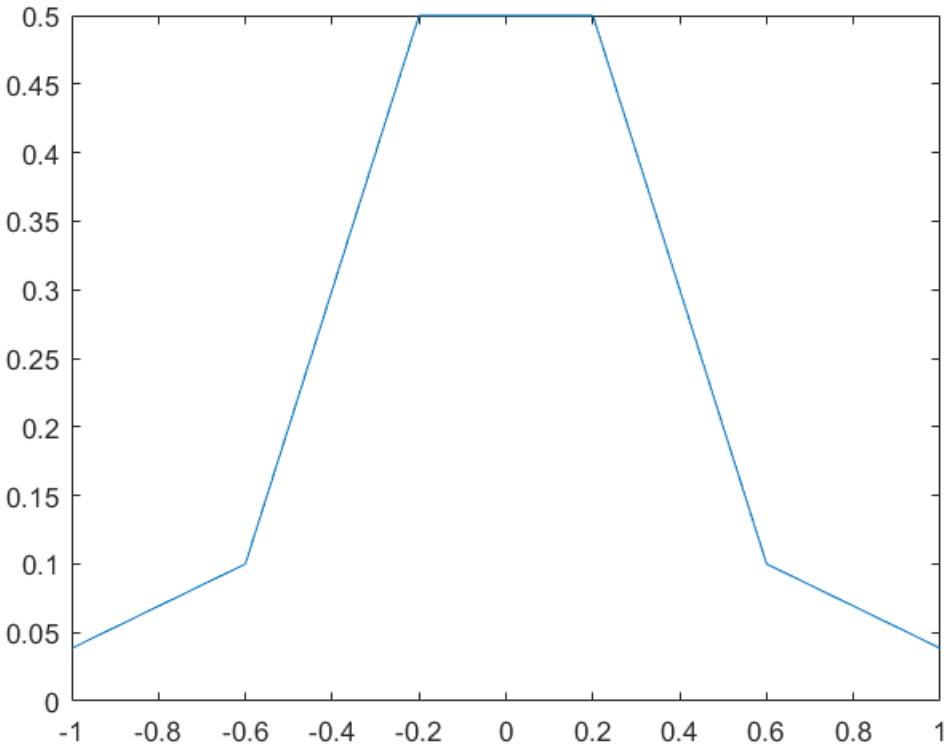
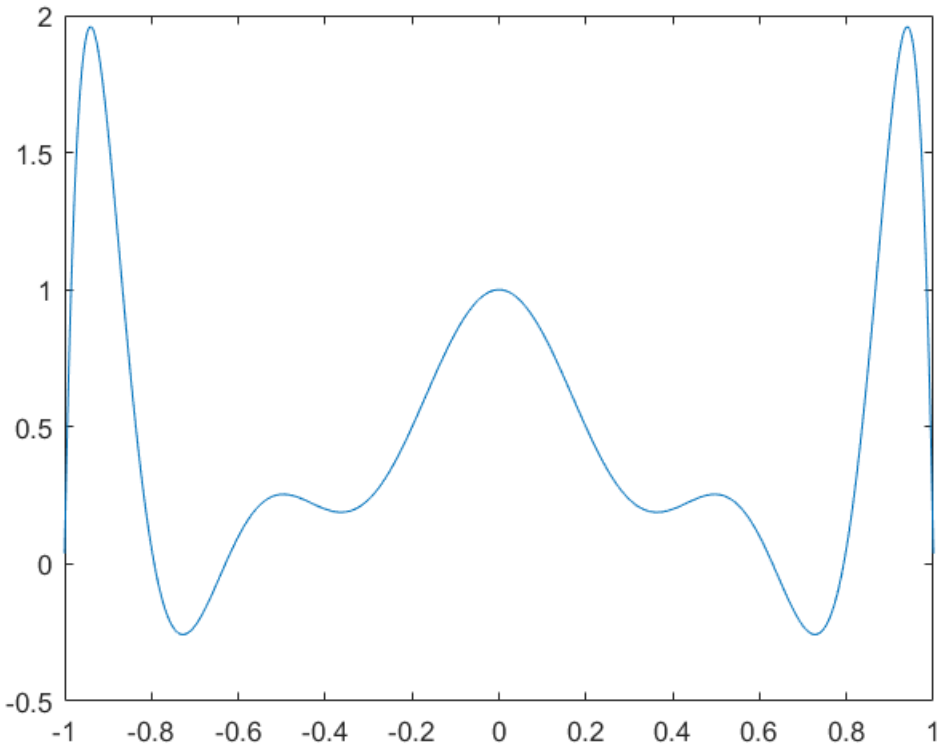
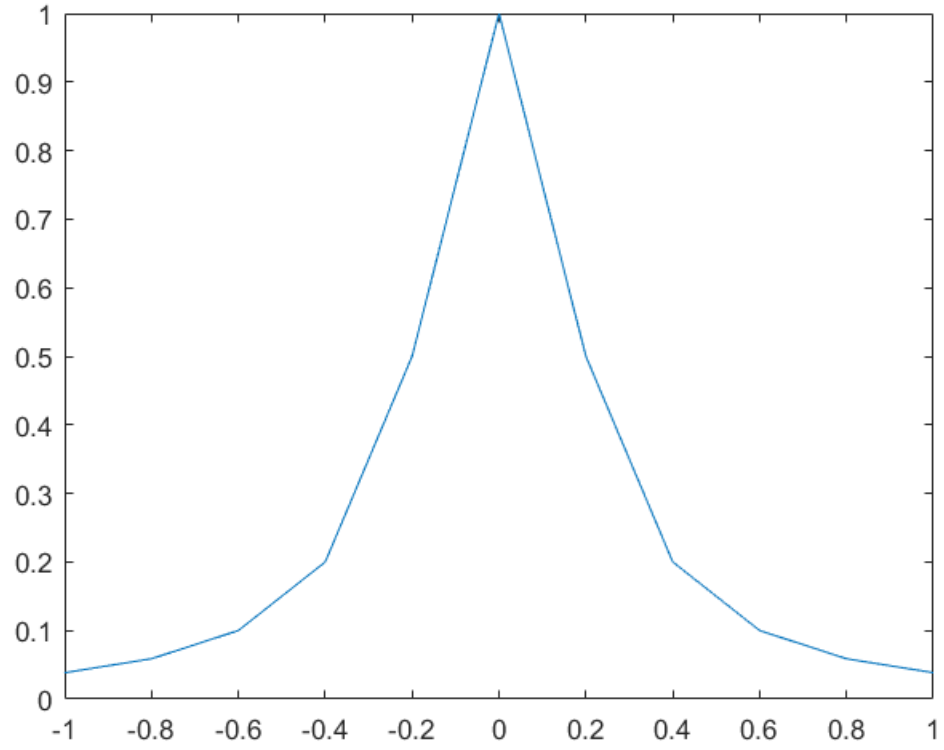
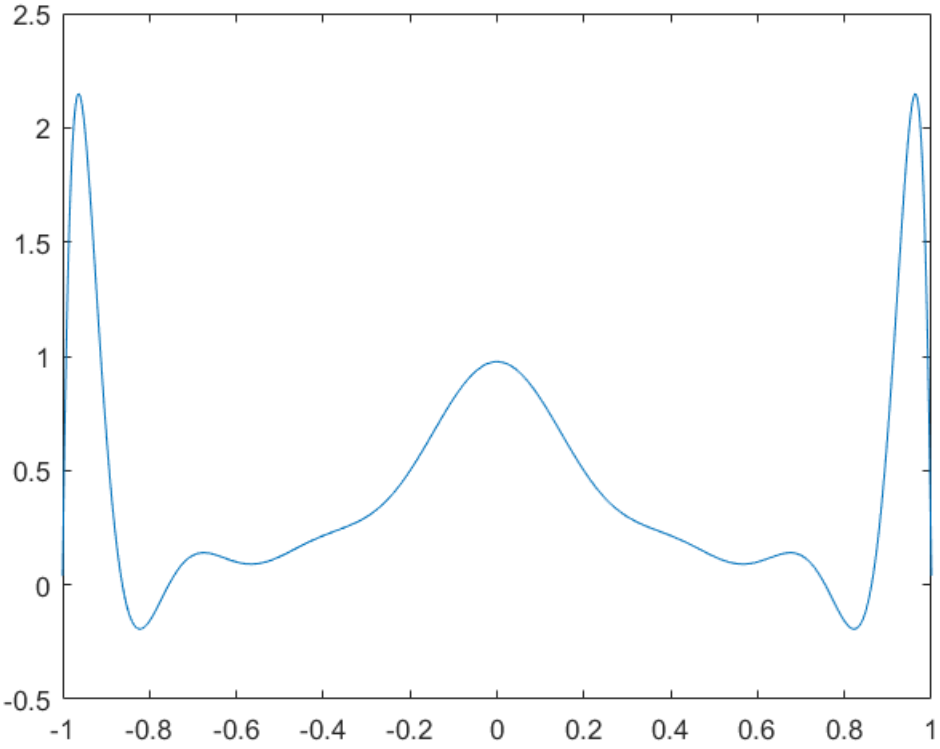
```
%3.1
n = [6 11 16];
N = 1000;
x = linspace(-1, 1, N)';

for ii = 1:3
    A = zeros(n(ii),n(ii));
    t = linspace(-1, 1, n(ii))';
    temp = vander(t);
    A = fliplr(temp);
    y = 1 ./ (1 + 25*t.^2);
    coefficient = A\y;
    coe = coefficient';
    flipcoe = fliplr(coe);
    calculate = polyval(flipcoe, x);

    figure
    plot(x,calculate)

    figure
    plot(t,y)
end

%As the degree of the polynomial increases, even though
%it can still fit the given points, but it tends to go off the
%the actual function with a higher fluctuations because
%polynomial grows much more faster as the degree increases
```

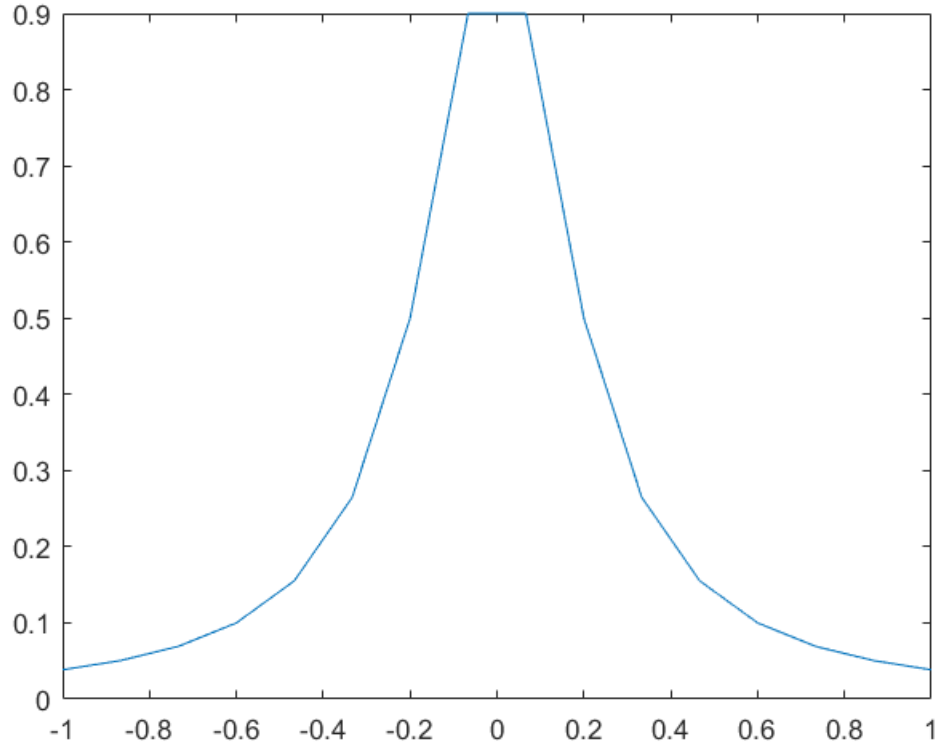

0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


2
1.5
1
0.5
0
-0.5
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


2.5
2
1.5
1
0.5
0
-0.5
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1


0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-1
-0.8
-0.6
-0.4
-0.2
0
0.2
0.4
0.6
0.8
1

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