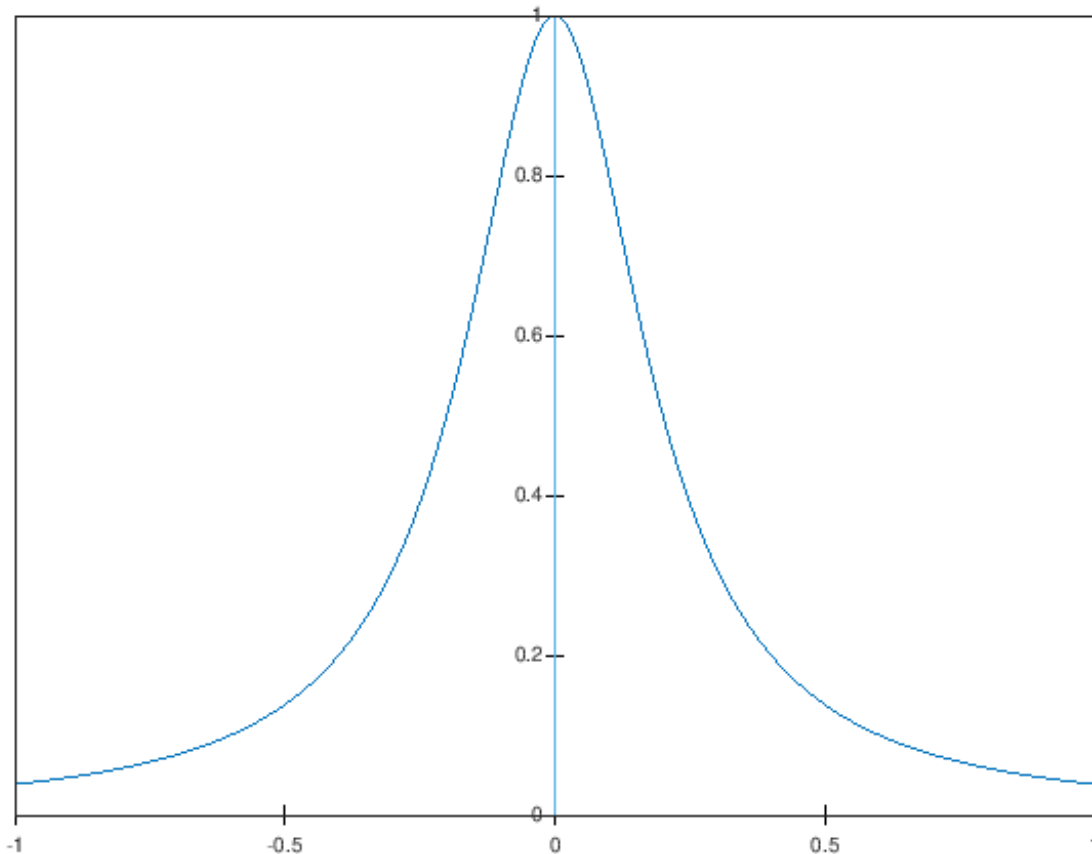```
X = -1:.01:1;
f = @(x) 1./(1 + 25*x.^2);
plot(X, f(X))
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
```
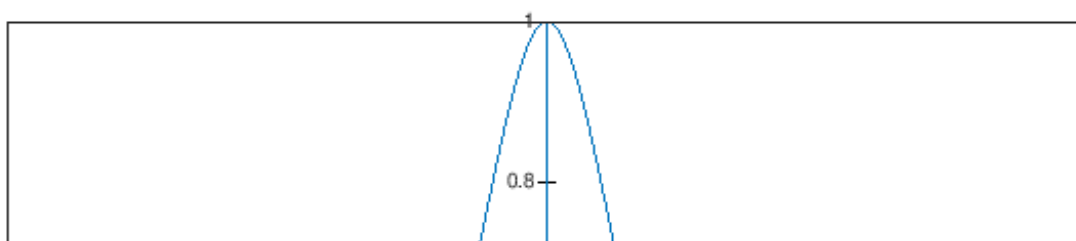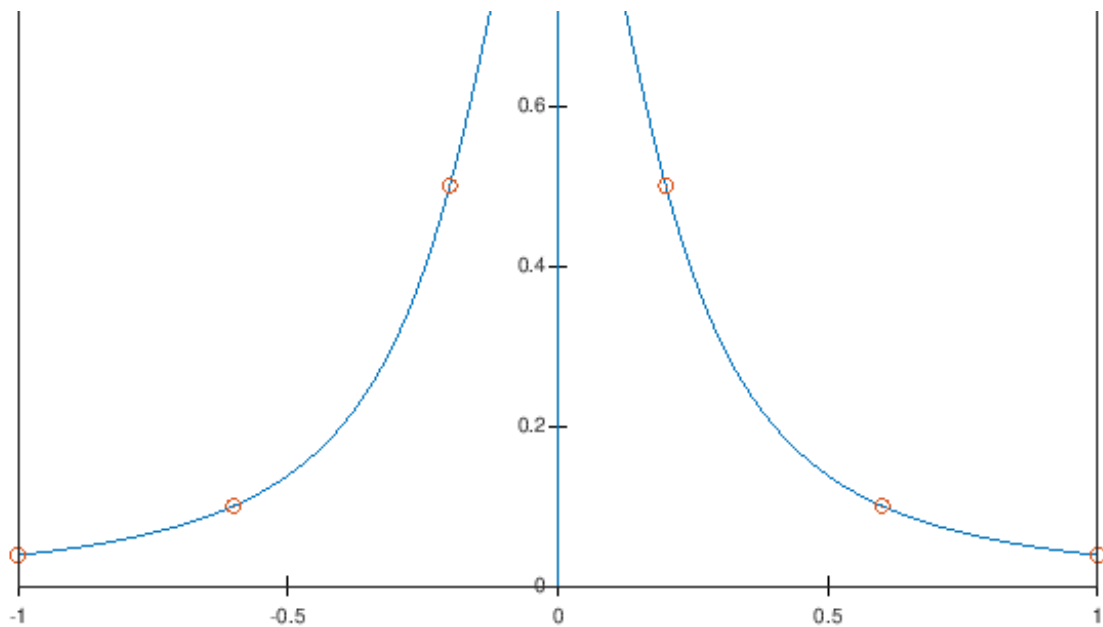
```
X = -1:.01:1;
f = @(x) 1./(1 + 25*x.^2);

P = [-1, -.6, -.2, .2, .6, 1];

plot(X, f(X))
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
hold on
scatter(P, f(P), 400)
```

In [7]:

```
X = -1:.01:1;
f = @(x) 1./(1 + 25*x.^2);

P = [-1, -.6, -.2, .2, .6, 1];

scatter(P, f(P), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
hold on

l = @(x) 3.1378*10^(-11) * x.^5 + 1.2019* x.^4 - 3.3651 *10^-11* x.^3
-1.7308*x.^2 + 1.0004*10^(-11)*x + .56731
plot(X, l(X))
```
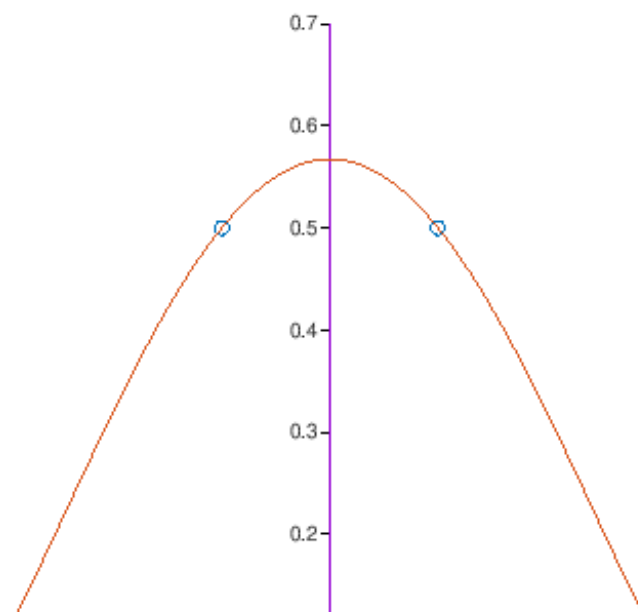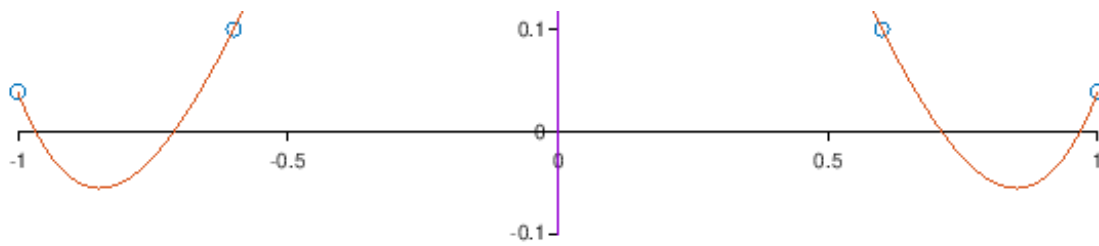
l =

@(x) 3.1378 * 10 ^ (-11) * x .^ 5 + 1.2019 * x .^ 4 - 3.3651 * 10 ^ -11 *
x .^ 3 - 1.7308 * x .^ 2 + 1.0004 * 10 ^ (-11) * x + .56731

Out[7]:

```matlab
X = -1:.01:1;
f = @(x) 1./(1 + 25*x.^2);


P = [-1, -.6, -.2, .2, .6, 1];
Q = -1:.2:1;



scatter(P, f(P), 400)
scatter(Q, f(Q), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
hold on

plot(X, f(X))
p = polyfit(P, f(P), 5)
plot(X, polyval(p,X))
q = polyfit(Q, f(Q), 11)
plot(X, polyval(q,X))
```

p =

   4.1134e-15   1.2019e+00   -5.5834e-15   -1.7308e+00   1.4085e-15
5.6731e-01
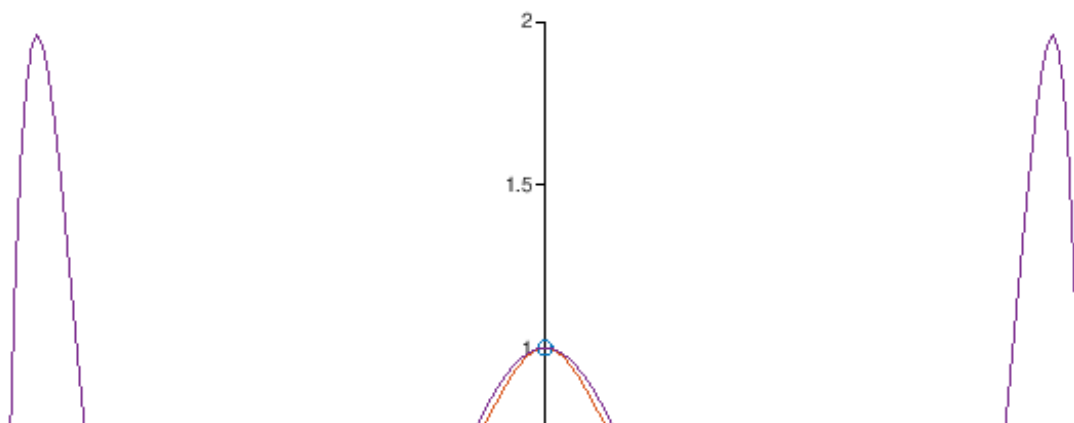
q =

 Columns 1 through 6:
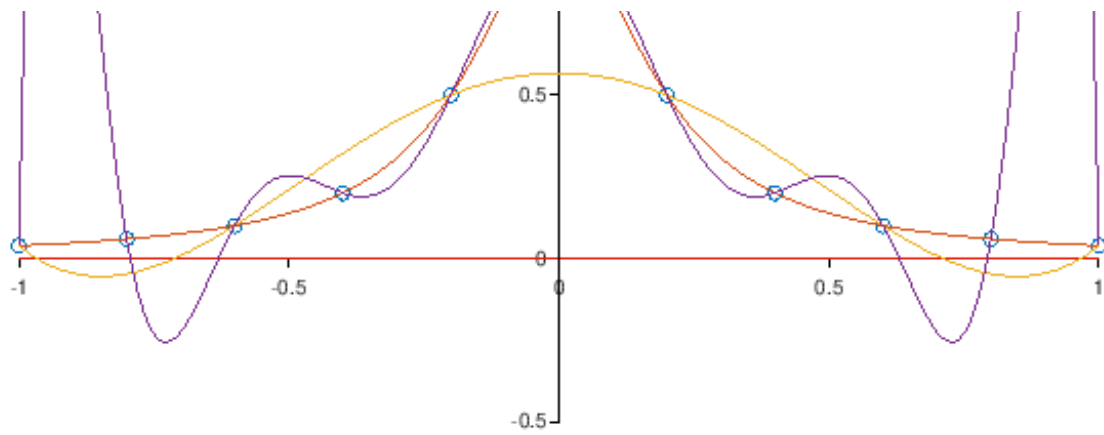
  -2.7972e-11   -2.2094e+02   5.5570e-11   4.9491e+02   -3.6142e-11   -3.8143e
+02

 Columns 7 through 12:

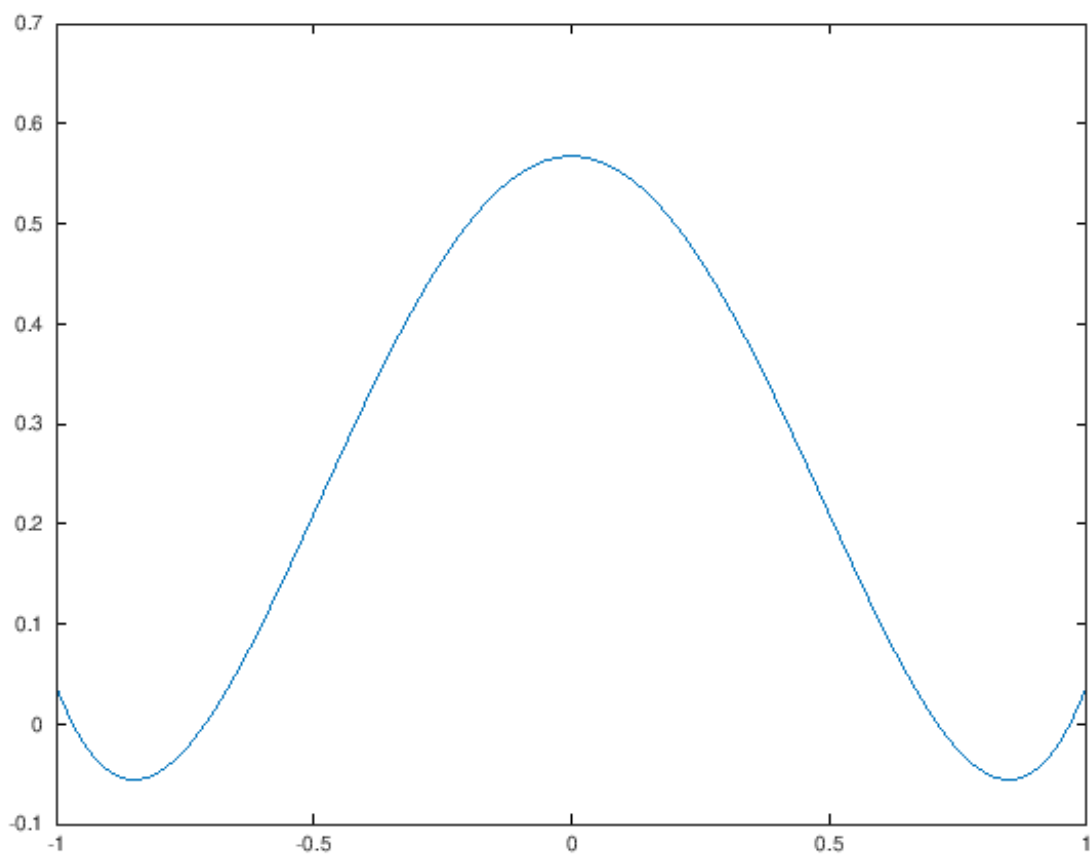   9.5129e-12   1.2336e+02   -8.6904e-13   -1.6855e+01   -1.1369e-13
1.0000e+00

Out[18]:

```
p =

   4.1134e-15   1.2019e+00  -5.5834e-15  -1.7308e+00   1.4085e-15
5.6731e-01
```

```
n = 6;
nodes = cos(pi/n*((1:n)-.5));
```

```
X = -1:.01:1;
f = @(x) 1./(1 + 25*x.^2);
```

```
n = 11;
nodes = cos(pi/n*((1:n)-.5));
m = 21;
nodes2 = cos(pi/m*((1:m)-.5));


Q = -1:.2:1;
QQ = -1:.1:1;

l = polyfit(Q, f(Q), length(Q)-1);
p = polyfit(nodes, f(nodes), n-1);

ll = polyfit(QQ, f(QQ), length(QQ)-1);
pp = polyfit(nodes2, f(nodes2), m-1);

subplot(2, 2, 1)
scatter(Q, f(Q), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
axis([-1 1 -1 1])
title("Poly. intepolation on equidistant nodes, n = 11")
hold on
plot(X, f(X))
plot(X, polyval(l,X))
hold off
subplot(2, 2, 2)
scatter(nodes, f(nodes), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
axis([-1 1 -1 1])
hold on
plot(X, f(X))
plot(X, polyval(p,X))
title("Poly. interpolation on Chebyshev nodes, n = 11")
subplot(2, 2, 3)
scatter(QQ, f(QQ), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
title("Poly. intepolation on equidistant nodes, n = 21")
axis([-1 1 -1 1])
hold on
plot(X, f(X))
plot(X, polyval(ll,X))
hold off
subplot(2, 2, 4)
scatter(nodes2, f(nodes2), 400)
set(gca,'xaxislocation','origin')
set(gca, 'yaxislocation','origin')
axis([-1 1 -1 1])
hold on
plot(X, f(X))
plot(X, polyval(pp,X))
title("Poly. interpolation on Chebyshev nodes, n = 21")
hold off
```
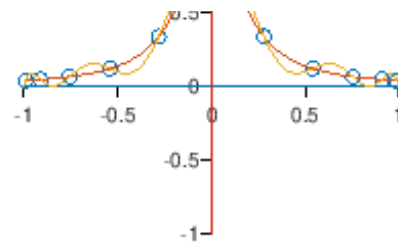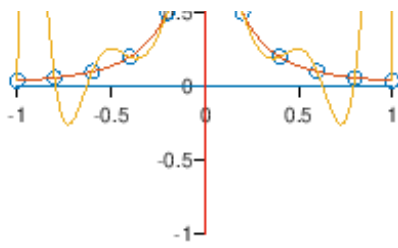
Out[34]:

Poly. intepolation on equidistant nodes, n = 21   Poly. interpolation on Chebyshev nodes, n = 21