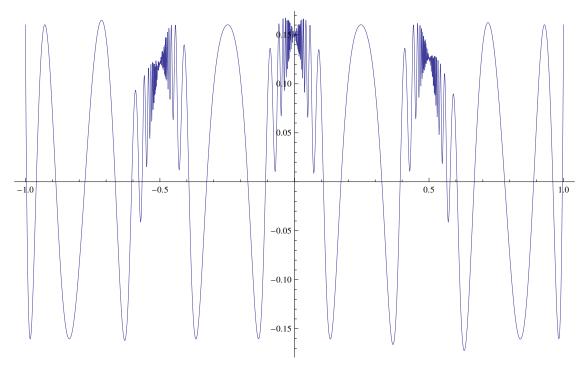
```
\mathbf{f}[\mathbf{x}_{-}] := 4 \cos \left[ \sqrt{2} \ \mathbf{x} \right] - \mathbf{x} \sin \left[ \frac{1}{\mathbf{x}} \right] - \left( \mathbf{x} - \frac{1}{2} \right) \sin \left[ \frac{1}{\mathbf{x} - \frac{1}{2}} \right] - \left( \mathbf{x} + \frac{1}{2} \right) \sin \left[ \frac{1}{\mathbf{x} + \frac{1}{2}} \right]
point = Sort[RandomReal[{-1, 1}, n + 1]]
interpoint = point;
b = Table[{f[point[[i]]]}, {i, n+1}];
a = N[Normal[SparseArray[{\{i_, 1\} \Rightarrow 1,}]]
           \{i_{n}, j_{n}\} / ; 2 \le j \le n \Rightarrow Part[point, i]^{j-1}, \{i_{n}, n+1\} \Rightarrow (-1)^{i}\}, \{n+1, n+1\}], \{n+1, n+1\}
\rho s = NMaximize \left[ \left\{ Abs \left[ f[x] - sol[[1, 1]] - \sum_{i=1}^{n-1} \left( sol[[k+1, 1]] \ x^k \right) \right], \ -1 \le x \le 1 \right\}, \ x \right]
\{\rho, x0\} = \{\rho s[[1]], x\} /. \rho s[[2]]
test = True;
\text{While}\Big[\text{test, If}\Big[-1 \leq x0 < \text{point}[[1]], \text{If}\Big[\left(\text{f}[x0] - \text{sol}[[1, 1]] - \sum_{k=1}^{n-1} \left(\text{sol}[[k+1, 1]] \times 0^{k}\right)\right)\Big]\Big]
         \left| f[point[[1]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[1]]^{k} \right) \right| \ge 0,
     interpoint[[1]] = x0, interpoint = RotateRight[point, 1]; interpoint[[1]] = x0 | |;
 If [point[[-1]] < x0 ≤ 1, If [ f[x0] - sol[[1, 1]] - \sum_{k=1}^{n-1} (sol[[k+1, 1]] x0<sup>k</sup>)
         \left| f[point[[-1]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[-1]]^k \right) \right| \ge 0,
     interpoint[[-1]] = x0, interpoint = RotateLeft[point, 1]; interpoint[[-1]] = x0 | ;
  If Select[Table[i, \{i, 1, n\}], point[[#]] \le x0 &] =!= {} &&
     Select[Table[i, \{i, 2, n+1\}], point[[\#]] \ge x0 \&] = != \{\},
    j = Last[Select[Table[i, {i, n}], point[[#]] \le x0 &]];
   If \left[ f[x0] - sol[[1, 1]] - \sum_{k=1}^{n-1} (sol[[k+1, 1]] x0^k) \right]
          \left| f[point[[j]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[j]]^{k} \right) \right| \ge 0,
     interpoint[[j]] = x0, interpoint[[j+1]] = x0];
 point = interpoint;
 b = N[Table[{f[point[[i]]]}, {i, n+1}], 6 n];
  a = N[Normal[SparseArray[{\{i_, 1\} \Rightarrow 1,}]]
           \{i_{-}, j_{-}\} /; 2 \le j \le n \Rightarrow Part[point, i]^{j-1}, \{i_{-}, n+1\} \Rightarrow (-1)^{i}\}, \{n+1, n+1\}], 6n];
 sol = N[Inverse[a].b, 6 n];
 \rho s = N \Big[ NMaximize \Big[ \Big\{ Abs \Big[ f[x] - sol[[1, 1]] - \sum_{k=1}^{n-1} \Big( sol[[k+1, 1]] x^k \Big) \Big], -1 \le x \le 1 \Big\}, x \Big], 6 n \Big];
 If [Abs[Abs[sol[[-1, 1]]] - \rho s[[1]]] < 10^{-n}, test = False];
 Print[N[sol[[-1]], 6 n]];
  \{\rho, x0\} = \{\rho s[[1]], x\} /. \rho s[[2]]
point
Plot [f[x] - sol[[1, 1]] - \sum_{k=1}^{n-1} (sol[[k+1, 1]] x^k), \{x, -1, 1\}]
```

```
\{-0.888298, -0.784824, -0.595155, 0.0383027, 0.595875, 0.940728, 0.976649\}
\{0.816829, \{x \rightarrow -0.250006\}\}
\{0.816829, -0.250006\}
{0.0923368}
{0.146709}
{0.16377}
{0.19771}
{0.237423}
{0.250585}
\{-0.321327\}
{-0.331739}
\{-0.340522\}
\{-0.341659\}
\{-1., -0.627091, -0.250006, 0.0708147, 0.259882, 0.634988, 1.\}
                                                           0.2
                                                           0.1
-1.0
                                                                                                                         1.0
                                                          -0.1
n = 20;
                     \frac{\text{RandomInteger}[\{-10^{20}, 10^{20}\}, n+1]}{}, 6 n];
point = Sort N
interpoint = point;
b = N[Table[{f[point[[i]]]}, {i, n+1}], 6n];
a = N[Normal[SparseArray[{\{i_, 1\}} : 1,
          \{i_{-}, j_{-}\} /; 2 \le j \le n \Rightarrow Part[point, i]^{j-1}, \{i_{-}, n+1\} \Rightarrow (-1)^{i}\}, \{n+1, n+1\}], 6n];
sol = N[Inverse[a].b, 6 n];
\rho s = NMaximize \left[ \left\{ Abs \left[ f\left[ x \right] - sol\left[ \left[ 1, 1 \right] \right] - \sum_{k=1}^{n-1} \left( sol\left[ \left[ k+1, 1 \right] \right] \, x^k \right) \right], \, -1 \leq x \leq 1 \right\}, \, x \right]
\{\rho, x0\} = \{\rho s[[1]], x\} /. \rho s[[2]]
test = True;
```

```
 \text{While} \Big[ \text{test, If} \Big[ -1 \le x0 < \text{point}[[1]], \, \text{If} \Big[ \Big[ \text{f}[x0] - \text{sol}[[1, 1]] - \sum_{k=1}^{n-1} \Big( \text{sol}[[k+1, 1]] \, x0^k \Big) \Big] \Big] \Big] 
        \left| f[point[[1]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[1]]^{k} \right) \right| \ge 0,
     interpoint[[1]] = x0, interpoint = RotateRight[point, 1]; interpoint[[1]] = x0];
 If [point[[-1]] < x0 \le 1, If [f[x0] - sol[[1, 1]] - \sum_{k=0}^{n-1} (sol[[k+1, 1]] x0^k)]
        \left| f[point[[-1]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[-1]]^k \right) \right| \ge 0,
     interpoint[[-1]] = x0, interpoint = RotateLeft[point, 1]; interpoint[[-1]] = x0 | ;
 Select[Table[i, {i, 2, n + 1}], point[[#]] \ge x0 \&] =!= {},
   j = Last[Select[Table[i, {i, n}], point[[#]] \le x0 &]];
   If \left[ f[x0] - sol[[1, 1]] - \sum_{k=1}^{n-1} (sol[[k+1, 1]] x0^{k}) \right]
         \left| f[point[[j]]] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] point[[j]]^{k} \right) \right| \ge 0,
     interpoint[[j]] = x0, interpoint[[j+1]] = x0];
 point = interpoint;
 b = N[Table[{f[point[[i]]]}, {i, n+1}], 6n];
 a = N[Normal[SparseArray[{i_, 1} :> 1,
          \{i_{n}, j_{n}\} /; 2 \le j \le n \Rightarrow Part[point, i]^{j-1}, \{i_{n}, n+1\} \Rightarrow (-1)^{i}, \{n+1, n+1\} ], \{n+1, n+1\} \}
 sol = N[Inverse[a].b, 6 n];
 \rho s = N \left[ NMaximize \left[ \left\{ Abs \left[ f[x] - sol[[1, 1]] - \sum_{k=1}^{n-1} \left( sol[[k+1, 1]] x^{k} \right) \right], -1 \le x \le 1 \right\}, x \right], 6 n \right];
 If [Abs[Abs[sol[[-1, 1]]] - \rho s[[1]]] < 10^{-10}, test = False];
 Print[N[sol[[-1, 1]], 6 n]];
 \{\rho, x0\} = \{\rho s[[1]], x\} /. \rho s[[2]]
point
g1 = Plot [f[x] - sol[[1, 1]] - \sum_{k=1}^{n-1} (sol[[k+1, 1]] x^k), \{x, -1, 1\}]
\mathtt{Print}\Big[\mathtt{sol}[\texttt{[1,1]}] + \sum_{}^{n-1} \big(\mathtt{sol}[\texttt{[k+1,1]}] \ \mathbf{x}^{k}\big)\Big]
\{2100.66, \{x \rightarrow -1.\}\}
\{2100.66, -1.\}
0.0279517
0.0280597
-0.0303653
-0.0303933
-0.0304138
-0.0304766
-0.0306248
```

- -0.030831
- -0.0310583
- -0.0312045
- -0.0313969
- -0.0322491
- -0.03226
- -0.0322839
- -0.0323214
- -0.0323722
- -0.0324335
- -0.0325179
- -0.0326586
- -0.0332485
- -0.0350557
- -0.0350846
- 0.0362425
- 0.0362468
- 0.0362535
- 0.0362651
- 0.0362825
- 0.0363067
- 0.0363396
- 0.036383
- 0.0364514
- 0.0365798
- 0.036794
- 0.0378726
- 0.0499207
- 0.0697973
- 0.0748881
- 0.0787707
- 0.081174
- 0.0829542
- 0.0842572
- 0.0844658
- 0.0853194
- 0.0856813
- 0.0859688
- 0.0860777

- -0.115014
- -0.115476
- -0.117532
- -0.124918
- -0.138678
- -0.144532
- -0.145018
- -0.147473
- -0.149624
- -0.152127
- -0.156034
- -0.156195
- -0.157608
- -0.157641
- -0.158687
- -0.159633
- -0.159642
- -0.16029
- -0.160291
- -0.160291
- $\{-1., -0.981382, -0.927614, -0.838068, -0.725816, -0.6334, -0.457556, -0.367134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457556, -0.457134, -0.457134, -0.457134, -0.457134, -0.457134, -0.457134, -0.457144, -0.45$
- -0.247904, -0.133437, -0.0584389, 0.132164, 0.246076, 0.371407, 0.442236,



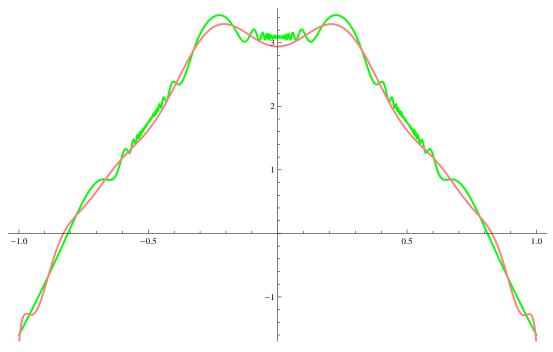
 $299.529 \, \mathbf{x}^7 + 283.195 \, \mathbf{x}^8 + 1464.47 \, \mathbf{x}^9 - 10\,360. \, \mathbf{x}^{10} - 4052.96 \, \mathbf{x}^{11} + 29\,099.3 \, \mathbf{x}^{12} + 6612.33 \, \mathbf{x}^{13} - 37\,683.8 \, \mathbf{x}^{14} - 6300.41 \, \mathbf{x}^{15} + 24\,052. \, \mathbf{x}^{16} + 3242.17 \, \mathbf{x}^{17} - 6105.86 \, \mathbf{x}^{18} - 696.053 \, \mathbf{x}^{19}$ 

$$sol[[1, 1]] + \sum_{k=1}^{n-1} (sol[[k+1, 1]] x^k)$$

 $2.94096 + 0.0168035 \, x + 18.2032 \, x^2 - 1.35426 \, x^3 - 273.564 \, x^4 + 31.3196 \, x^5 + 965.774 \, x^6 - 10.0168035 \, x + 10.0168000 \, x + 10.01680000 \, x + 10.0168000 \, x + 10.0160000 \, x + 10.0160000 \, x + 10.0160000 \, x + 10.01600000 \, x$  $299.529 \, \mathbf{x}^7 + 283.195 \, \mathbf{x}^8 + 1464.47 \, \mathbf{x}^9 - 10360. \, \mathbf{x}^{10} - 4052.96 \, \mathbf{x}^{11} + 29099.3 \, \mathbf{x}^{12} + 6612.33 \, \mathbf{x}^{13} - 100.000 \, \mathbf{x}^{10} + 100.0000$  $37\,683.8\,{x}^{14}-6300.41\,{x}^{15}+24\,052.\,{x}^{16}+3242.17\,{x}^{17}-6105.86\,{x}^{18}-696.053\,{x}^{19}$ 

$$\label{eq:show_plot} \begin{split} &\operatorname{Show}\Big[\operatorname{Plot}[\mathtt{f}[\mathtt{x}]\,,\,\{\mathtt{x},\,-1,\,1\}\,,\,\operatorname{PlotStyle}\,\rightarrow\,\{\operatorname{Thick},\,\operatorname{Green}\}\,]\,, \end{split}$$

$$\text{Plot}\Big[\text{sol}[[1,1]] + \sum_{k=1}^{n-1} \left(\text{sol}[[k+1,1]] \ x^k\right), \ \{x,-1,1\}, \ \text{PlotStyle} \rightarrow \{\text{Thick, Pink}\}\Big]\Big]$$



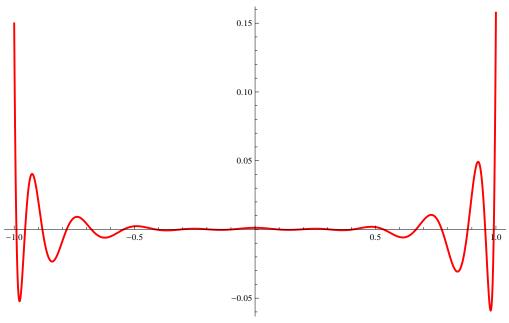
```
-0.7258161170478117`, -0.6334001381988549`, -0.4575559588576906`,
              -0.367133595166574`, -0.24790357759282936`, -0.1334365453555474`,
              -0.058438925296807956`, 0.058438925296807956`, 0.13216436145150076`,
              0.24607567767603752, 0.3714073922134931, 0.4422358962410348,
              0.71293046296282853524~120., 0.8371992841876895~,
              0.9287715942408771, 0.9822948678503866, 1. };
{point, RotateRight[point]} // MatrixForm
                                                                                                                                                                                                                                                               -0.981382
                                                                                                                                                                                                                                                                -0.927614
                                                                                                                                                                                                                                                                -0.838068
                                                                                                                                                                                                                                                                -0.725816
                                                                                                                                                                                                                                                                   -0.6334
                                                                                                                                                                                                                                                                -0.457556
                                                                                                                                                                                                                                                                -0.367134
                                                                                                                                                                                                                                                                -0.247904
                                                                                                                                                                                                                                                                -0.133437
                                                                                                                                                                                                                                                              -0.0584389
                                                                                                                                                                                                                                                                  0.132164
                                                                                                                                                                                                                                                                  0.246076
                                                                                                                                                                                                                                                                  0.371407
                                                                                                                                                                                                                                                                  0.442236
      0.837199
                                                                                                                                                                                                                                                                  0.928772
                                                                                                                                                                                                                                                                  0.982295
                                                  Total[{point, RotateRight[point]}], 1
\{-0.990691, -0.954498, -0.882841, -0.781942, -0.679608, -0.545478, -0.412345, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.88284
    -0.307519, -0.19067, -0.0959377, 0.0368627, 0.18912, 0.308742, 0.406822, 0.533056, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.066827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.068827, -0.
    point[[1;;11]]
\{-1., -0.981382, -0.927614, -0.838068, -0.725816,
   -0.6334, -0.457556, -0.367134, -0.247904, -0.133437, -0.0584389
\alpha = mean
\{-0.990691, -0.954498, -0.882841, -0.781942, -0.679608, -0.545478, -0.412345, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.88284
    -0.307519, -0.19067, -0.0959377, 0.0368627, 0.18912, 0.308742, 0.406822, 0.533056,
   0.058438925296807956 + 0.13216436145150076
\alpha[[11]] = -
                                                                                                                                     2
0.0953016
\{-0.990691, -0.954498, -0.882841, -0.781942, -0.679608, -0.545478, -0.412345, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.882841, -0.88284
    -0.307519, -0.19067, -0.0959377, 0.0953016, 0.18912, 0.308742, 0.406822, 0.533056,
```

$$S[x_{-}] := \prod_{k=1}^{n} (\alpha[[k]] - x)$$

 $\texttt{NMaximize[\{Abs[4000S[x]],-1 \leq x \leq 1\}, x]}$ 

 $\{\,\text{0.157618}\,,\,\,\{\,x\,\rightarrow\,\text{1.}\,\}\,\}$ 

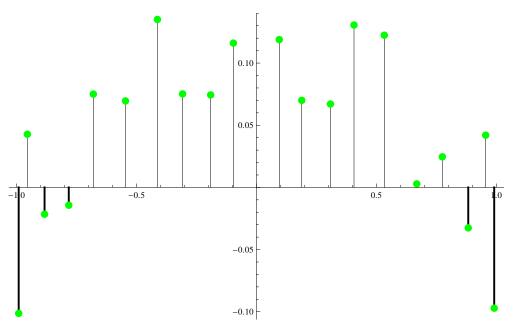
 $g2 = Plot[4000 S[x], \{x, -1, 1\}, PlotRange \rightarrow Full, PlotStyle \rightarrow \{Red, Thick\}]$ 



g3 =

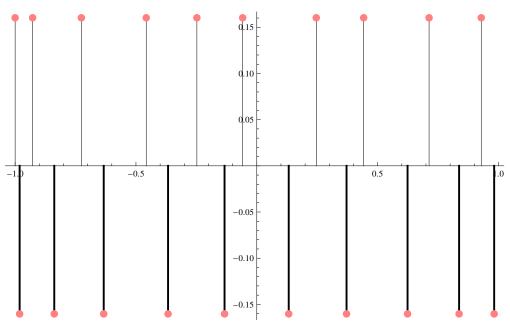
 $ListPlot\Big[Table\Big[\Big\{\alpha[[k]]\,,\,f[\alpha[[k]]]\,-\,sol[[1,\,1]]\,-\,\sum_{j=1}^{n-1}\Big(sol[[j+1,\,1]]\,\alpha[[k]]^j\Big)\Big\},\,\{k,\,1,\,n\}\Big]\,,$ 

 $\texttt{PlotStyle} \rightarrow \{\texttt{PointSize[0.015], Green}\}, \texttt{Filling} \rightarrow \texttt{Axis, FillingStyle} \rightarrow \{\texttt{Thick, Black}\} \Big]$ 



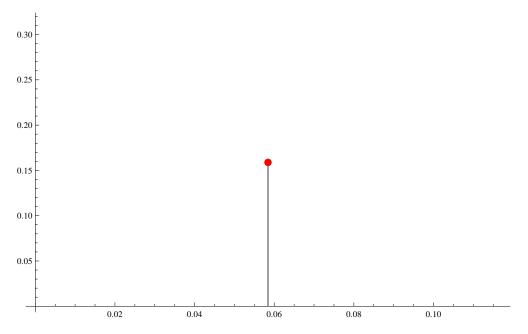
$$\left\{ \text{point}[[k]], \, \text{f[point[[k]]] - sol[[1, 1]] - } \sum_{j=1}^{n-1} \left( \text{sol[[j+1, 1]] point[[k]]}^{j} \right) \right\}, \, \{k, 1, n\} \right],$$

PlotStyle → {PointSize[0.015], Pink}, Filling → Axis, FillingStyle → {Thick, Black}

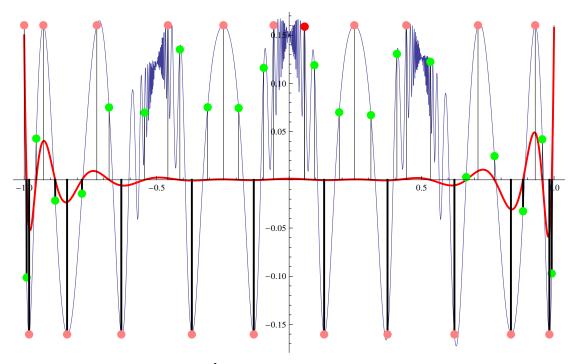


$$Table \Big[ \Big\{ pnt[[k]] \text{, } f[pnt[[k]]] - sol[[1, 1]] - \sum_{j=1}^{n-1} \Big( sol[[j+1, 1]] \text{ } pnt[[k]]^j \Big) \Big\}, \text{ } \{k, 12, 12\} \Big], \\$$

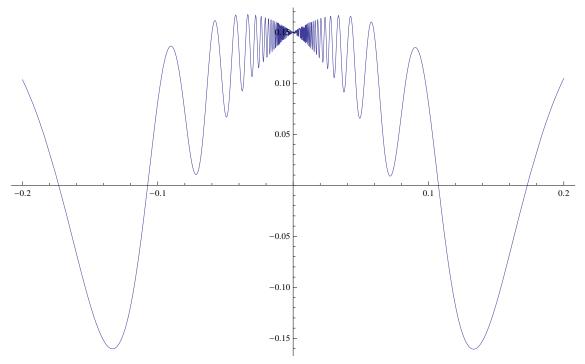
PlotStyle → {PointSize[0.015], Red}, Filling → Axis, FillingStyle → {Thick, Black}



Show[g1, g2, g3, g4, g5]



g11 = Plot[f[x] - sol[[1, 1]] - 
$$\sum_{k=1}^{n-1}$$
 (sol[[k+1, 1]] x<sup>k</sup>), {x, -0.2, 0.2}]



## Show[g11, g2, g3, g4, g5]

