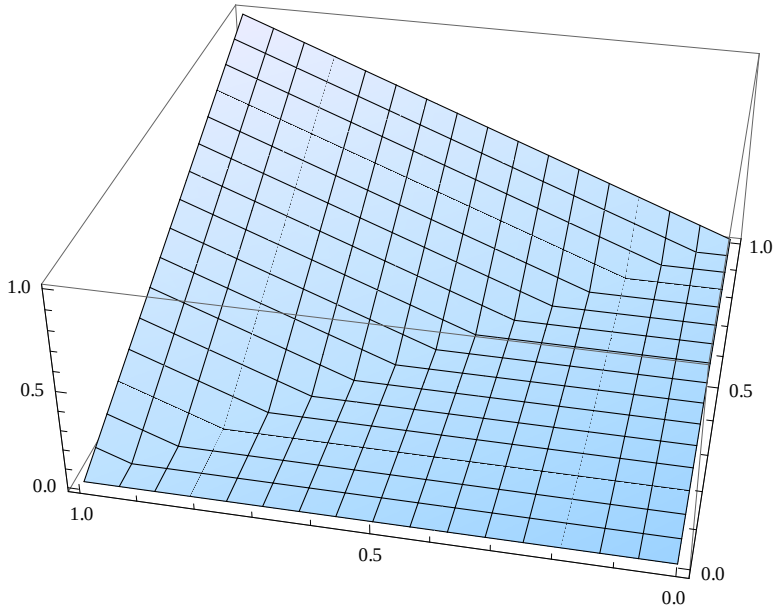
```
daten = {#[[2]], #[[1]]} & /@ hedgeI;
d = {{{0, 0, 0}, {0, 1, 0}}, {{1, 0, 0}, {1, 1, 1}}};
n = Length[d] - 1;(*Anzahl der Punkte - 1*)
p = 3;(*Ordnung*)
m = n + 1 + p ;(*Anzahl der Knots - 1*)
(*Knot-Erzeugung*)
u = Join[Table[0, {i, p}], Table[i / (n + 1 - p), {i, 0, n + 1 - p}], Table[1, {i, p}]];
w = Table[ts[i], {i, 5, 8}];

ListPlot3D[Flatten[d, 1]]
```



```
P[t0_] := Module[{ab, a, k, j = m, i, t = t0, u = u, d = d * w, p = p, n = n, m = m, w = w},
  (*j Bestimmtung*)
  If[t == 0, j = 1,
   While[t <= u[[j]], j--]];
  If[j <= p, j = p + 1];

  ab = Table[{0, 0}, {i, n + 1}];

  (*Berechnung*)
  For[k = 1, k ≤ p, k++,
   For[i = j - p + k, i ≤ j, i++,
     a = (t - u[[i]]) / (u[[i + p + 1 - k]] - u[[i]]);
     ab[[i]] =
      (1 - a) ab[[i - 1]] + a ab[[i]] + (d[[i]] - d[[i - 1]]) / (u[[i + p + 1 - k]] - u[[i]]);

     d[[i]] = (1 - a) d[[i - 1]] + a d[[i]];
     w[[i]] = (1 - a) w[[i - 1]] + a w[[i]];
    ];
  ];
  Simplify[Append[d[[j]] / w[[j]], #[[2]] / #[[1]] &[ab[[j]]]]]
 ]

tt = Table[P[f[x, 2]], {x, 0, 1, 0.01}];

tt[[3]]
```

$$\left\{\left(0.000799999\,ts[1]\,ts[6]+6.40511\times10^{-7}\,ts[3]\,ts[7]+5.12\times10^{-10}\,ts[8]\right)\Big/\left(0.999199\,ts[5]+0.000799999\,ts[6]+6.40511\times10^{-7}\,ts[7]+5.12\times10^{-10}\,ts[8]\right),\right.$$
$$\left(-0.0114634\,ts[5]+0.000799999\,ts[2]\,ts[6]+6.40511\times10^{-7}\,ts[4]\,ts[7]+6.05469\times10^{-12}\,ts[8]\right)\Big/\left(0.999199\,ts[5]+0.000799999\,ts[6]+6.40511\times10^{-7}\,ts[7]+5.12\times10^{-10}\,ts[8]\right),$$
$$\left.\left(0.011491\,ts[5]+0.999998\,ts[2]\,ts[6]+0.00160192\,ts[4]\,ts[7]+2.27051\times10^{-8}\,ts[8]\right)\Big/\left(0.999998\,ts[1]\,ts[6]+0.00160192\,ts[3]\,ts[7]+1.92\times10^{-6}\,ts[8]\right)\right\}$$

```
s[v0_] := Module[{i, s = 0, y, b, v = v0,
    tt = tt /. Table[ts[i] → v0[[i]], {i, 8}], daten = daten, n = Length[tt], j},
  For[i = 2, i < Length[daten], i++,

   (*j Bestimmtung*)
   j = n;
   While[daten[[i, 1]] ≤ tt[[j, 1]], j--];

   b = tt[[j + 1, 1]] - tt[[j, 1]]; y = daten[[i, 1]] - tt[[j, 1]];
   s += (daten[[i, 2]] - {tt[[j, 2]], tt[[j + 1, 2]], tt[[j, 3]], tt[[j + 1, 3]]}.
         {1 - 3 y^2/b^2 + 2 y^3/b^3, 3 y^2/b^2 - 2 y^3/b^3, y - 2 y^2/b + y^3/b^2, -y^2/b + y^3/b^2})^2;
  ];
  s / Variance[Transpose[daten][[2]]] / Length[daten]]
```

```
n1 = 10; n2 = 10; min = 10^10; pmin = {};
For[i = 0, i ≤ n1, i++,

 For[j = 0, j ≤ n1, j++,
  Print[min];
  For[k = 0, k ≤ n2, k++,
   For[l = 0, l ≤ n2, l++,

    t1 = -2 + 6 i / n1;
    t2 = -2 + 6 j / n1;
    t3 = -0.05 + 0.1 k / n2;
    t4 = -0.05 + 0.1 l / n2;

    st = s[{t1, t2, t3, t4, 1, 1, 1, 1}];
    If[st < min, min = st; pmin = {i, j, k, l}];

   ]]]]
```

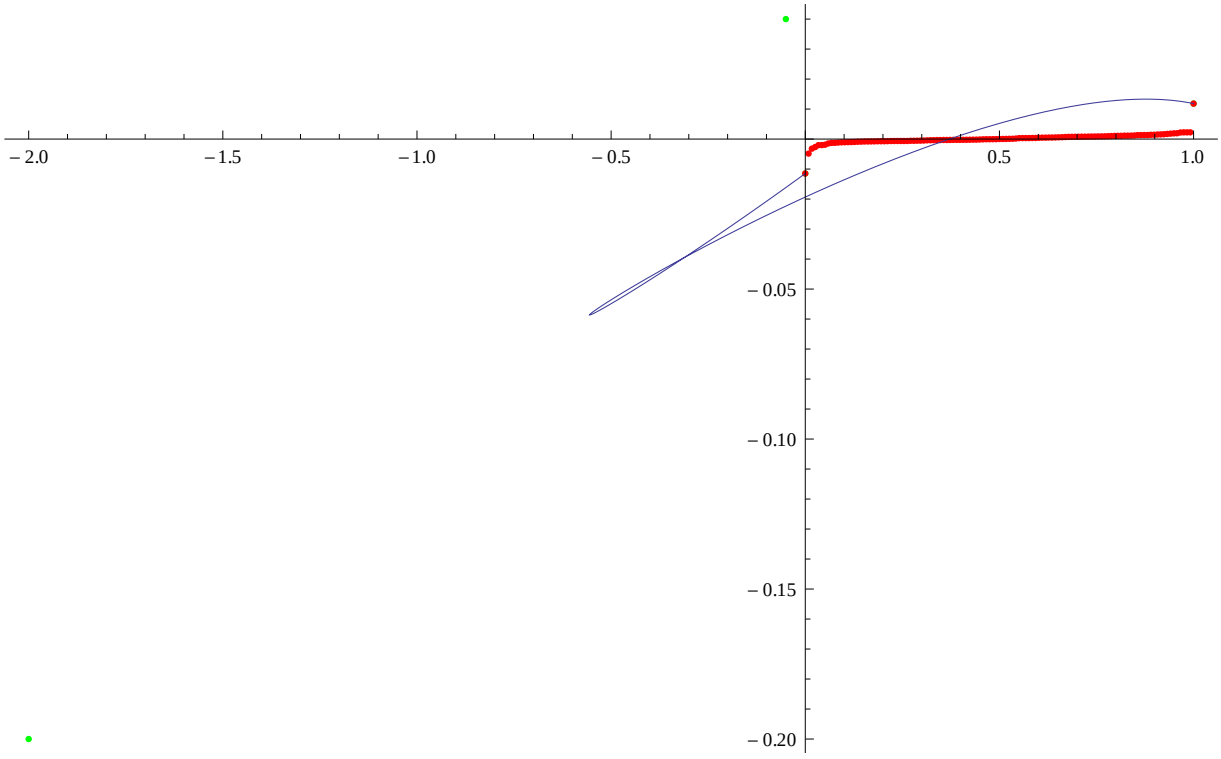
```
pmin
```

```
{0, 3, 0, 9}
```

```
t1 = -2
t2 = -2 + 6 * 3 / n1;
t3 = -0.05
t4 = -0.05 + 0.1 * 9 / n2;
```

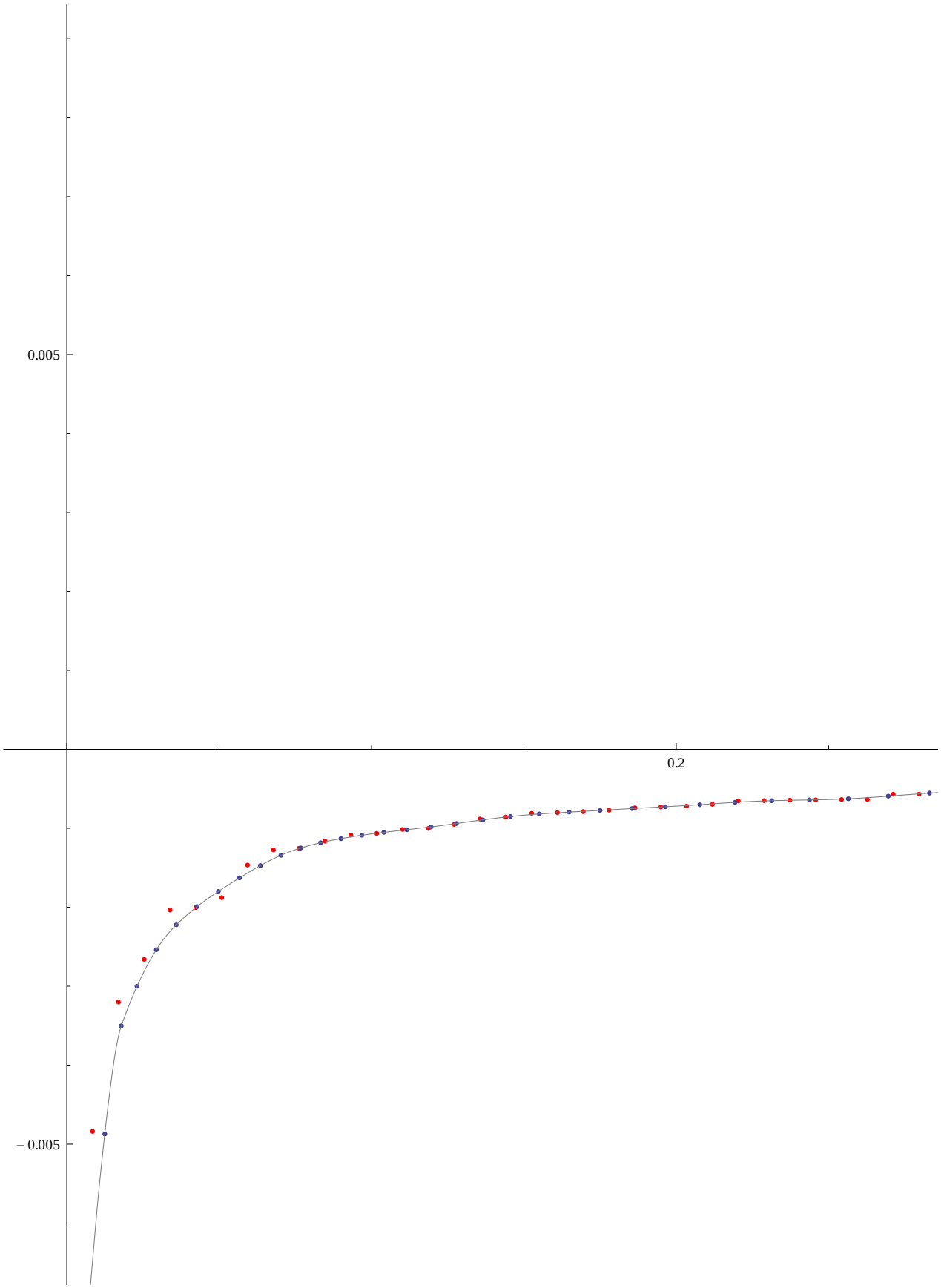
```
v = {-2, -2 + 6 * 3 / n1, -0.05, -0.05 + 0.1 * 9 / n2, 1, 1, 1, 1}; s[v]
Show[ListPlot[d /. Table[ts[i] → v[[i]], {i, 8}], PlotStyle → Green],
 ListPlot[daten, PlotStyle → Red, PlotRange → All],
 ListPlot[Transpose[Transpose[tt][[1 ;; 2]]] /. Table[ts[i] → v[[i]], {i, 8}],
  Joined → True, PlotRange → All]]
```

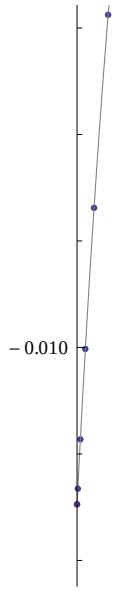
```
23.8601
```




```
f[x_, n_] := Piecewise[{{(2 x)^n / 2, x ≤ 0.5}}, -(2 - 2 x)^n / 2 + 1];
Plot[f[x, 2], {x, 0, 1}];
```

```
Show[ListPlot[d, Joined → False, PlotStyle → Red, PlotRange → All],
 ListPlot[tt, Joined → False, PlotRange → All],
 Plot[IP[x], {x, 0, 1}, PlotStyle → Gray, PlotRange → All]]
```


0.005
0.2
– 0.005




```
IP[t0_] := Module[{t = t0, tt = tt, j = Length[tt], m = ab, y},
  (*j Bestimmtung*)
  If[t == 0, j = 1,
   While[t ≤ tt[[j, 1]], j--]];
  b = tt[[j + 1, 1]] - tt[[j, 1]]; y = t - tt[[j, 1]];
  {tt[[j, 2]], tt[[j + 1, 2]], m[[j]], m[[j + 1]]}.
   {1 - 3 y^2/b^2 + 2 y^3/b^3, 3 y^2/b^2 - 2 y^3/b^3, y - 2 y^2/b + y^3/b^2, -y^2/b + y^3/b^2}
]
```