```
Get[FileNameJoin[{NotebookDirectory[], "DeSite.wl"}]]
```

Aplikační příklad 6

Apl. příklad 6: Jednoduchý model chování sloupce plasmy stlačované zářením odvodil Troesch ve tvaru nelineární okrajové úlohy

$$\frac{\partial^2 y}{\partial x^2} = \alpha \sinh(\alpha y) \quad ,$$

$y(0) = 0, \; y(1) = 1.$

Použijte parametry α=0,8; 1; 2; 5; 10; 20.

$\alpha = 0.8$

Definice parametrů diferenciální rovnice

```
α = 0.8;
```

Definice pravé strany diferenciální rovnice

```
f[x_, y1_, y2_] = α Sinh[α y1];
```

Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[0.05 * (i - 1), {i, 1, n + 1}];
```

```
yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 10];
```

```
iterace =  0
```

```
y={0., 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35,
  0.4, 0.45, 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.}
```

```
iterace = 1     s = 0.0479017
```

```
y={0., 0.0449207, 0.0899133, 0.13505, 0.180403, 0.226046,
  0.272052, 0.318497, 0.365456, 0.413009, 0.461234, 0.510214, 0.560033,
  0.610777, 0.662537, 0.715407, 0.769485, 0.824873, 0.881679, 0.940014, 1.}
```

```
iterace = 2     s = 0.0000179775
```

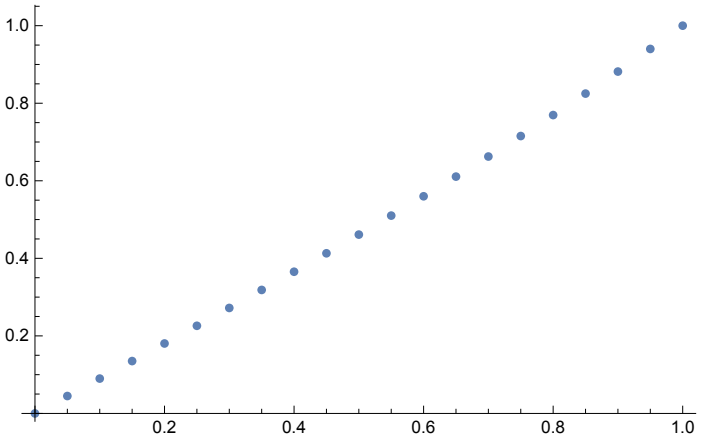
```
y={0., 0.044919, 0.08991, 0.135045, 0.180396, 0.226037,
  0.272042, 0.318485, 0.365444, 0.412995, 0.46122, 0.510199, 0.560018,
  0.610762, 0.662524, 0.715395, 0.769475, 0.824865, 0.881673, 0.940012, 1.}
```

```
iterace = 3     s = 2.26586×10^-12
```

```
y={0., 0.044919, 0.08991, 0.135045, 0.180396, 0.226037,
  0.272042, 0.318485, 0.365444, 0.412995, 0.46122, 0.510199, 0.560018,
  0.610762, 0.662524, 0.715395, 0.769475, 0.824865, 0.881673, 0.940012, 1.}
```

Graf řešení *y*(x)

```
ListPlot[yres]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	0.044919
0.1	0.08991
0.15	0.135045
0.2	0.180396
0.25	0.226037
0.3	0.272042
0.35	0.318485
0.4	0.365444
0.45	0.412995
0.5	0.46122
0.55	0.510199
0.6	0.560018
0.65	0.610762
0.7	0.662524
0.75	0.715395
0.8	0.769475
0.85	0.824865
0.9	0.881673
0.95	0.940012
1.	1.

$\alpha = 1.0$

Definice parametrů diferenciální rovnice

```
α = 1.0;
```

Definice pravé strany diferenciální rovnice

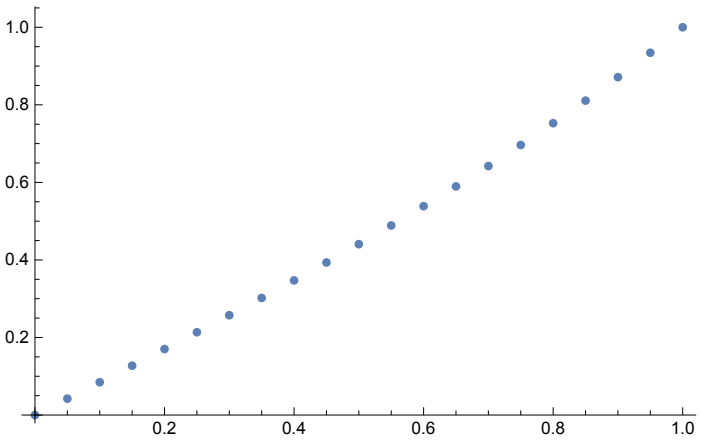
```
f[x_, y1_, y2_] = α Sinh[α y1];
```

Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[0.05 * (i - 1), {i, 1, n + 1}];

yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 10];

iterace =  0

y={0., 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35,
  0.4, 0.45, 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.}

iterace = 1     s = 0.0735046

y={0., 0.0422899, 0.0846855, 0.127293, 0.17022, 0.213574,
  0.257465, 0.302007, 0.347314, 0.393506, 0.440705, 0.48904, 0.538645,
  0.589659, 0.642231, 0.696518, 0.752688, 0.81092, 0.871407, 0.934358, 1.}

iterace = 2     s = 0.000102554

y={0., 0.0422808, 0.0846672, 0.127266, 0.170183, 0.213528,
  0.257411, 0.301944, 0.347244, 0.39343, 0.440624, 0.488957, 0.538561,
  0.589577, 0.642154, 0.696449, 0.75263, 0.810875, 0.871376, 0.934343, 1.}

iterace = 3     s = 1.66341×10^-10

y={0., 0.0422808, 0.0846672, 0.127266, 0.170183, 0.213528,
  0.257411, 0.301944, 0.347244, 0.39343, 0.440624, 0.488957, 0.538561,
  0.589577, 0.642154, 0.696449, 0.75263, 0.810875, 0.871376, 0.934343, 1.}
```

Graf řešení *y*(x)

```
ListPlot[yres]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	0.0422808
0.1	0.0846672
0.15	0.127266
0.2	0.170183
0.25	0.213528
0.3	0.257411
0.35	0.301944
0.4	0.347244
0.45	0.39343
0.5	0.440624
0.55	0.488957
0.6	0.538561
0.65	0.589577
0.7	0.642154
0.75	0.696449
0.8	0.75263
0.85	0.810875
0.9	0.871376
0.95	0.934343
1.	1.

$\alpha = 2.0$

Definice parametrů diferenciální rovnice

```
α = 2.0;
```

Definice pravé strany diferenciální rovnice

```
f[x_, y1_, y2_] = α Sinh[α y1];
```

Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[0.05 * (i - 1), {i, 1, n + 1}];
```

```
yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 10];
```

```
iterace =  0
```

```
y={0., 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35,
  0.4, 0.45, 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.}
```

```
iterace = 1     s = 0.234818
```

```
y={0., 0.0270391, 0.0543483, 0.0821985, 0.110863, 0.140617,
  0.171743, 0.204532, 0.239288, 0.276335, 0.316026, 0.358754, 0.40497,
  0.455201, 0.510085, 0.570406, 0.637148, 0.711571, 0.795306, 0.8905, 1.}
```

```
iterace = 2     s = 0.0153383
```

```
y={0., 0.026006, 0.0522722, 0.0790621, 0.106646, 0.135304,
  0.165332, 0.197043, 0.230776, 0.266899, 0.305819, 0.347991, 0.39393,
  0.444227, 0.499574, 0.560788, 0.628861, 0.705016, 0.790799, 0.888225, 1.}
```

```
iterace = 3     s = 0.0000321098
```

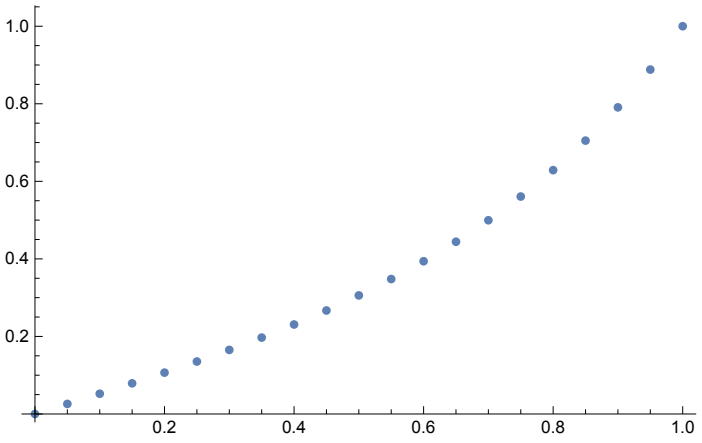
```
y={0., 0.0260039, 0.052268, 0.0790558, 0.106637, 0.135293,
  0.165319, 0.197028, 0.230759, 0.26688, 0.305798, 0.347969, 0.393907,
  0.444204, 0.499552, 0.560768, 0.628844, 0.705002, 0.79079, 0.888221, 1.}
```

```
iterace = 4     s = 1.3601×10^-10
```

```
y={0., 0.0260039, 0.052268, 0.0790558, 0.106637, 0.135293,
  0.165319, 0.197028, 0.230759, 0.26688, 0.305798, 0.347969, 0.393907,
  0.444204, 0.499552, 0.560768, 0.628844, 0.705002, 0.79079, 0.888221, 1.}
```

Graf řešení *y*(x)

```
ListPlot[yres]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	0.0260039
0.1	0.052268
0.15	0.0790558
0.2	0.106637
0.25	0.135293
0.3	0.165319
0.35	0.197028
0.4	0.230759
0.45	0.26688
0.5	0.305798
0.55	0.347969
0.6	0.393907
0.65	0.444204
0.7	0.499552
0.75	0.560768
0.8	0.628844
0.85	0.705002
0.9	0.79079
0.95	0.888221
1.	1.

$\alpha = 5.0$

Definice parametrů diferenciální rovnice

```
α = 5.0;
```

Definice pravé strany diferenciální rovnice

```
f[x_, y1_, y2_] = α Sinh[α y1];
```

Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[0.05 * (i - 1), {i, 1, n + 1}];
```

```
yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 10];
```

```
iterace =  0
```

```
y={0., 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35,
  0.4, 0.45, 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.}
```

```
iterace = 1     s = 0.274566
```

```
y={0., 0.018461, 0.0380466, 0.0597797, 0.0844912, 0.112753,
  0.14484, 0.18073, 0.220141, 0.262597, 0.307511, 0.354277, 0.402344,
  0.451264, 0.50072, 0.550545, 0.600799, 0.652188, 0.708194, 0.787115, 1.}
```

```
iterace = 2     s = 0.285183
```

```
y={0., 0.00721376, 0.014877, 0.0234582, 0.0334592, 0.045421,
  0.0599143, 0.0775107, 0.0987347, 0.124001, 0.153554, 0.187426, 0.225437,
  0.267268, 0.312617, 0.361519, 0.415026, 0.476901, 0.558463, 0.693904, 1.}
```

```
iterace = 3     s = 0.208217
```

```
y={0., 0.00314666, 0.00648993, 0.0102382, 0.0146241, 0.0199172,
  0.0264383, 0.0345735, 0.0447877, 0.0576355, 0.0737686, 0.0939399, 0.119015,
  0.150015, 0.18825, 0.235643, 0.295485, 0.374102, 0.484816, 0.65944, 1.}
```

```
iterace = 4     s = 0.0519403
```

```
y={0., 0.0024256, 0.00500281, 0.00789272, 0.011276, 0.0153643,
  0.0204135, 0.0267401, 0.0347413, 0.0449216, 0.0579263, 0.0745885, 0.0959949,
  0.123585, 0.159318, 0.205961, 0.267685, 0.351363, 0.469929, 0.653221, 1.}
```

```
iterace = 5     s = 0.00169866
```

```
y={0., 0.0024052, 0.00496072, 0.00782632, 0.0111812, 0.0152352,
  0.0202424, 0.0265169, 0.0344536, 0.0445543, 0.0574627, 0.0740121, 0.0952935,
  0.122759, 0.158387, 0.204982, 0.266753, 0.350596, 0.469431, 0.653016, 1.}
```

```
iterace = 6     s = 1.61546×10^-6
```

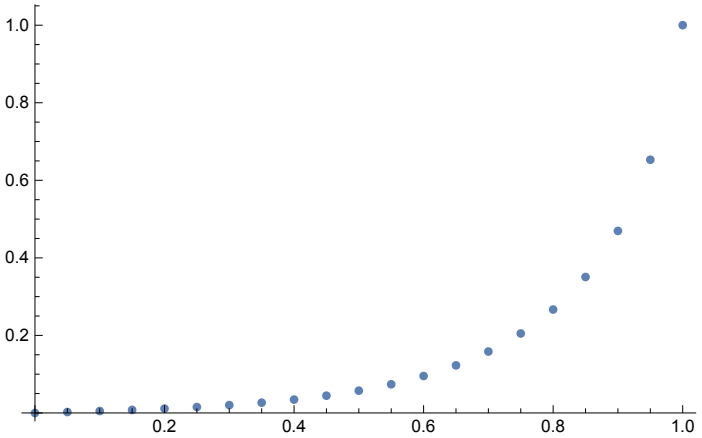
```
y={0., 0.00240518, 0.00496068, 0.00782626, 0.0111811, 0.0152351,
  0.0202423, 0.0265167, 0.0344533, 0.0445539, 0.0574622, 0.0740116, 0.0952929,
  0.122758, 0.158386, 0.204981, 0.266752, 0.350596, 0.46943, 0.653015, 1.}
```

```
iterace = 7     s = 1.51195×10^-12
```

```
y={0., 0.00240518, 0.00496068, 0.00782626, 0.0111811, 0.0152351,
  0.0202423, 0.0265167, 0.0344533, 0.0445539, 0.0574622, 0.0740116, 0.0952929,
  0.122758, 0.158386, 0.204981, 0.266752, 0.350596, 0.46943, 0.653015, 1.}
```

Graf řešení *y*(x)

```
ListPlot[yres, PlotRange → All]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	0.00240518
0.1	0.00496068
0.15	0.00782626
0.2	0.0111811
0.25	0.0152351
0.3	0.0202423
0.35	0.0265167
0.4	0.0344533
0.45	0.0445539
0.5	0.0574622
0.55	0.0740116
0.6	0.0952929
0.65	0.122758
0.7	0.158386
0.75	0.204981
0.8	0.266752
0.85	0.350596
0.9	0.46943
0.95	0.653015
1.	1.

$\alpha = 10.0$

Definice parametrů diferenciální rovnice

```
α = 10.0;
```

Definice pravé strany diferenciální rovnice

```
f[x_, y1_, y2_] = α Sinh[α y1];
```

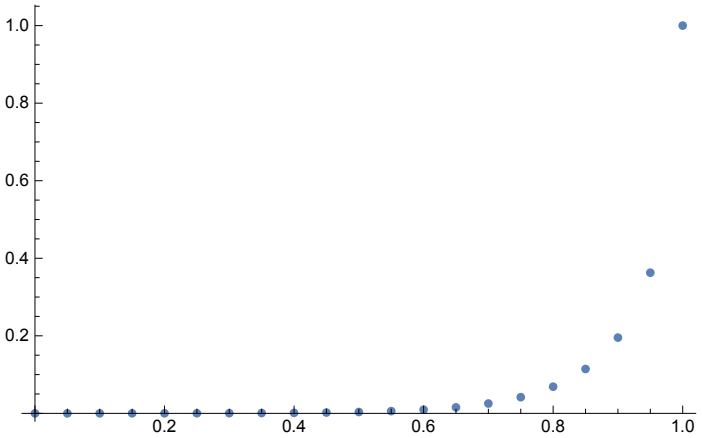
Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[0.05 * (i - 1), {i, 1, n + 1}];

yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 12];

iterace =  0

y={0., 0.05, 0.1, 0.15, 0.2, 0.25, 0.3, 0.35,
  0.4, 0.45, 0.5, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85, 0.9, 0.95, 1.}

iterace = 1     s = 0.15274

y={0., 0.018906, 0.0420738, 0.0722755, 0.109999, 0.153744, 0.201177, 0.25033, 0.300092,
  0.350029, 0.40001, 0.450003, 0.500001, 0.55, 0.6, 0.65, 0.7, 0.75, 0.8, 0.85006, 1.}

iterace = 2     s = 0.165028

y={0., 0.00740444, 0.0166366, 0.0297699, 0.0490619,
  0.0763262, 0.111957, 0.154499, 0.201408, 0.250389, 0.300107, 0.350033,
  0.400011, 0.450004, 0.500001, 0.550001, 0.6, 0.65, 0.700001, 0.750384, 1.}

iterace = 3     s = 0.177539

y={0., 0.00282452, 0.00635372, 0.0114549, 0.0193258, 0.0316135,
  0.0502947, 0.0770608, 0.112317, 0.154636, 0.201449, 0.250399, 0.300109,
  0.350033, 0.400011, 0.450004, 0.500001, 0.550001, 0.600013, 0.651691, 1.}

iterace = 4     s = 0.188841

y={0., 0.00105803, 0.00238049, 0.00429713, 0.00728257, 0.0120624,
  0.0197438, 0.0319115, 0.0505006, 0.0771859, 0.112378, 0.15466, 0.201456,
  0.2504, 0.30011, 0.350034, 0.400012, 0.450008, 0.500134, 0.556275, 1.}

iterace = 5     s = 0.195511

y={0., 0.000393889, 0.000886247, 0.00160012, 0.00271372, 0.00450434,
  0.0074146, 0.0121504, 0.0198061, 0.0319575, 0.0505333, 0.0772061, 0.112388,
  0.154664, 0.201457, 0.250402, 0.30012, 0.350122, 0.401127, 0.470412, 1.}

iterace = 6     s = 0.189665

y={0., 0.000146455, 0.000329524, 0.000594971, 0.00100915, 0.00167553,
  0.00276047, 0.00453401, 0.00743447, 0.0121651, 0.0198189, 0.0319706, 0.0505491,
  0.0772292, 0.112431, 0.154766, 0.201773, 0.251703, 0.307437, 0.406285, 1.}

iterace = 7     s = 0.155175

y={0., 0.0000555323, 0.000124948, 0.0002256, 0.000382651, 0.000635362,
  0.0010469, 0.00172008, 0.00282295, 0.00463008, 0.00758828, 0.0124158, 0.0202321,
  0.0326625, 0.0517447, 0.0794279, 0.116939, 0.165636, 0.234036, 0.373375, 1.}

iterace = 8     s = 0.0753367

y={0., 0.0000285746, 0.0000642929, 0.000116084, 0.000196897, 0.000326934,
  0.000538703, 0.000885147, 0.00145287, 0.00238376, 0.00391041, 0.00641383, 0.0105171,
  0.0172344, 0.0281986, 0.0459917, 0.0746592, 0.121036, 0.200252, 0.363815, 1.}

iterace = 9     s = 0.0104333
```

```
y={0., 0.0000256221, 0.0000576498, 0.00010409, 0.000176553, 0.000293153,
  0.000483043, 0.000793693, 0.00130277, 0.00213755, 0.00350675, 0.00575281, 0.00943783,
  0.0154857, 0.0254198, 0.0417748, 0.0688698, 0.114543, 0.195458, 0.362762, 1.}

iterace = 10     s = 0.000147365

y={0., 0.0000255857, 0.0000575677, 0.000103942, 0.000176301, 0.000292736,
  0.000482355, 0.000792563, 0.00130091, 0.0021345, 0.00350176, 0.00574463, 0.00942445,
  0.0154639, 0.0253847, 0.04172, 0.0687906, 0.114448, 0.195385, 0.362748, 1.}

iterace = 11     s = 2.96088×10^-8

y={0., 0.0000255856, 0.0000575677, 0.000103942, 0.000176301, 0.000292736,
  0.000482355, 0.000792562, 0.00130091, 0.0021345, 0.00350175, 0.00574463, 0.00942444,
  0.0154639, 0.0253847, 0.04172, 0.0687906, 0.114448, 0.195385, 0.362748, 1.}
```

Graf řešení *y*(x)

```
ListPlot[yres, PlotRange → All]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	0.0000255856
0.1	0.0000575677
0.15	0.000103942
0.2	0.000176301
0.25	0.000292736
0.3	0.000482355
0.35	0.000792562
0.4	0.00130091
0.45	0.0021345
0.5	0.00350175
0.55	0.00574463
0.6	0.00942444
0.65	0.0154639
0.7	0.0253847
0.75	0.04172
0.8	0.0687906
0.85	0.114448
0.9	0.195385
0.95	0.362748
1.	1.

α = 20.0

Definice parametrů diferenciální rovnice

```
α = 20.0;
```

Definice pravé strany diferenciální rovnice

```
f[x_, y1_, y2_] = α Sinh[α y1];
```

Parametry programu DESite2

```
a = 0.0;
b = 1.0;
α1 = 1;
α2 = 1;
β1 = 0;
β2 = 0;
γ1 = 0;
γ2 = 1;
ϵ = 0.000001;
n = 20;
y0 = Table[((0.05 * (i - 1)) ^5, {i, 1, n + 1}]
```

```
{0., 3.125×10^-7, 0.00001, 0.0000759375, 0.00032, 0.000976563,
 0.00243, 0.00525219, 0.01024, 0.0184528, 0.03125, 0.0503284, 0.07776,
 0.116029, 0.16807, 0.237305, 0.32768, 0.443705, 0.59049, 0.773781, 1.}
```

```
yres = DESite2[n, f, a, b, α1, α2 , β1, β2 , γ1 , γ2 , ϵ, y0, 20];
```

```
iterace = 0
y={0., 3.125×10^-7, 0.00001, 0.0000759375, 0.00032, 0.000976563,
  0.00243, 0.00525219, 0.01024, 0.0184528, 0.03125, 0.0503284, 0.07776,
  0.116029, 0.16807, 0.237305, 0.32768, 0.443705, 0.59049, 0.773781, 1.}
iterace = 1     s = 0.0931029
y={0., 1.35252×10^-6, 4.05755×10^-6, 0.0000108201, 0.0000284028, 0.0000743844,
  0.00019464, 0.000507853, 0.00131238, 0.00331315, 0.00800604, 0.01809, 0.0374457,
  0.0702025, 0.119499, 0.187692, 0.277754, 0.393714, 0.540491, 0.723781, 1.}
iterace = 2     s = 0.0880597
y={0., 3.26995×10^-7, 9.80984×10^-7, 2.61596×10^-6, 6.86689×10^-6, 0.0000179847,
  0.0000470872, 0.000123276, 0.00032273, 0.000844725, 0.00220845, 0.00574039,
  0.0145928, 0.034924, 0.0747536, 0.138913, 0.227962, 0.343738, 0.490492, 0.673781, 1.}
iterace = 3     s = 0.0846417
y={0., 1.36996×10^-7, 4.10987×10^-7, 1.09596×10^-6, 2.87691×10^-6, 7.53475×10^-6, 0.0000197274,
  0.0000516473, 0.000135214, 0.000353994, 0.000926739, 0.00242569, 0.00634108,
  0.0164517, 0.0412314, 0.0933898, 0.178601, 0.293803, 0.440496, 0.623782, 1.}
iterace = 4     s = 0.0818337
y={0., 7.17513×10^-8, 2.15254×10^-7, 5.74011×10^-7, 1.50678×10^-6, 3.94632×10^-6, 0.0000103322,
  0.0000270503, 0.0000708186, 0.000185405, 0.000485396, 0.00127076, 0.00332648,
  0.00870141, 0.0226529, 0.0574087, 0.130903, 0.243991, 0.390507, 0.573784, 1.}
iterace = 5     s = 0.079164
y={0., 4.24546×10^-8, 1.27364×10^-7, 3.39637×10^-7, 8.91547×10^-7, 2.335×10^-6, 6.11347×10^-6,
  0.0000160054, 0.0000419027, 0.000109703, 0.000287205, 0.000751912, 0.0019685,
  0.00515303, 0.0134807, 0.0351145, 0.0889523, 0.194609, 0.340537, 0.52379, 1.}
```

iterace = 6 s = 0.0762611

y={0., 2.71248×10^-8, 8.13745×10^-8, 2.16999×10^-7, 5.69622×10^-7, 1.49187×10^-6, 3.90598×10^-6, 0.0000102261, 0.0000267722, 0.0000700906, 0.0001835, 0.000480408, 0.00125772, 0.00329272, 0.00861966, 0.0225524, 0.0587689, 0.146916, 0.290624, 0.473809, 1.}

iterace = 7 s = 0.0732387

y={0., 1.83574×10^-8, 5.50723×10^-8, 1.46859×10^-7, 3.85506×10^-7, 1.00966×10^-6, 2.64347×10^-6, 6.92075×10^-6, 0.0000181188, 0.0000474356, 0.000124188, 0.000325128, 0.000851197, 0.00222847, 0.00583428, 0.0152756, 0.0400123, 0.104741, 0.240905, 0.423869, 1.}

iterace = 8 s = 0.0692913

y={0., 1.28603×10^-8, 3.85809×10^-8, 1.02882×10^-7, 2.70066×10^-7, 7.07316×10^-7, 1.85188×10^-6, 4.84833×10^-6, 0.0000126931, 0.000033231, 0.0000869999, 0.000227769, 0.000596307, 0.00156116, 0.00408723, 0.0107019, 0.0280421, 0.0737919, 0.191945, 0.374054, 1.}

iterace = 9 s = 0.0652374

y={0., 9.41684×10^-9, 2.82505×10^-8, 7.53347×10^-8, 1.97754×10^-7, 5.17926×10^-7, 1.35602×10^-6, 3.55015×10^-6, 9.29442×10^-6, 0.0000243331, 0.0000637049, 0.000166782, 0.00043664, 0.00114314, 0.00299283, 0.00783626, 0.0205319, 0.0540405, 0.145741, 0.324614, 1.}

iterace = 10 s = 0.0599219

y={0., 6.99669×10^-9, 2.09901×10^-8, 5.59735×10^-8, 1.4693×10^-7, 3.84818×10^-7, 1.00752×10^-6, 2.63775×10^-6, 6.90573×10^-6, 0.0000180794, 0.0000473326, 0.000123918, 0.000324423, 0.000849351, 0.00222365, 0.00582201, 0.0152497, 0.0400574, 0.107082, 0.276294, 1.}

iterace = 11 s = 0.0506483

y={0., 5.35301×10^-9, 1.6059×10^-8, 4.28241×10^-8, 1.12413×10^-7, 2.94416×10^-7, 7.70834×10^-7, 2.01808×10^-6, 5.28342×10^-6, 0.0000138322, 0.0000362131, 0.0000948072, 0.000248208, 0.000649819, 0.00170126, 0.00445418, 0.0116652, 0.0306108, 0.0813947, 0.231225, 1.}

iterace = 12 s = 0.0385367

y={0., 4.43521×10^-9, 1.33056×10^-8, 3.54816×10^-8, 9.31393×10^-8, 2.43936×10^-7, 6.3867×10^-7, 1.67207×10^-6, 4.37755×10^-6, 0.0000114606, 0.0000300042, 0.0000785519, 0.000205652, 0.000538404, 0.00140957, 0.00369046, 0.00966467, 0.025355, 0.0673325, 0.194539, 1.}

iterace = 13 s = 0.0216443

y={0., 3.98961×10^-9, 1.19688×10^-8, 3.19168×10^-8, 8.37817×10^-8, 2.19428×10^-7, 5.74503×10^-7, 1.50408×10^-6, 3.93774×10^-6, 0.0000103091, 0.0000269897, 0.0000706599, 0.00018499, 0.000484311, 0.00126795, 0.00331967, 0.00869339, 0.0228026, 0.0604799, 0.173704, 1.}

iterace = 14 s = 0.00544727

y={0., 3.87581×10^-9, 1.16274×10^-8, 3.10065×10^-8, 8.13921×10^-8, 2.1317×10^-7, 5.58117×10^-7, 1.46118×10^-6, 3.82543×10^-6, 0.0000100151, 0.0000262199, 0.0000686445, 0.000179714, 0.000470497, 0.00123178, 0.00322498, 0.00844539, 0.0221513, 0.0587383, 0.168492, 1.}

iterace = 15 s = 0.000274173

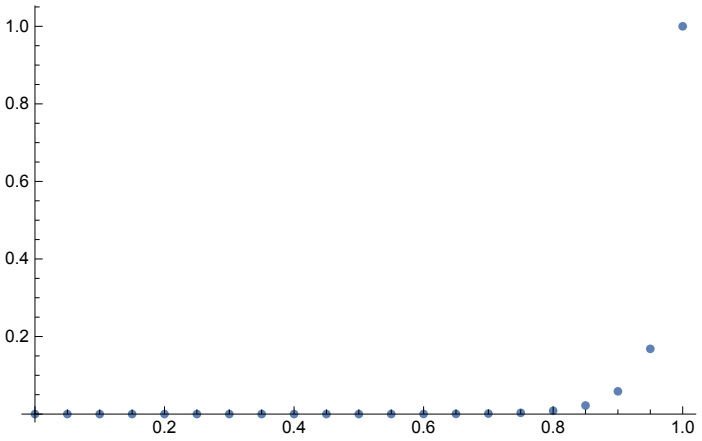
y={0., 3.86988×10^-9, 1.16096×10^-8, 3.0959×10^-8, 8.12675×10^-8, 2.12843×10^-7, 5.57263×10^-7, 1.45894×10^-6, 3.81957×10^-6, 9.99977×10^-6, 0.0000261797, 0.0000685394, 0.000179439, 0.000469777, 0.0012299, 0.00322004, 0.00843246, 0.0221174, 0.058648, 0.168231, 1.}

iterace = 16 s = 6.44607×10^-7

y={0., 3.86987×10^-9, 1.16096×10^-8, 3.09589×10^-8, 8.12672×10^-8, 2.12843×10^-7, 5.57261×10^-7, 1.45894×10^-6, 3.81956×10^-6, 9.99973×10^-6, 0.0000261796, 0.0000685392, 0.000179438, 0.000469775, 0.00122989, 0.00322003, 0.00843243, 0.0221173, 0.0586478, 0.16823, 1.}

Graf řešení *y*(x)

```
ListPlot[yres, PlotRange → All]
```



Tabulka řešení *y*(x)

```
MatrixForm[yres]
```

0.	0.
0.05	3.86987×10^{-9}
0.1	1.16096×10^{-8}
0.15	3.09589×10^{-8}
0.2	8.12672×10^{-8}
0.25	2.12843×10^{-7}
0.3	5.57261×10^{-7}
0.35	1.45894×10^{-6}
0.4	3.81956×10^{-6}
0.45	9.99973×10^{-6}
0.5	0.0000261796
0.55	0.0000685392
0.6	0.000179438
0.65	0.000469775
0.7	0.00122989
0.75	0.00322003
0.8	0.00843243
0.85	0.0221173
0.9	0.0586478
0.95	0.16823
1.	1.