FIGURE 2.1

Solution to the Cauchy problem (2.3), (2.4).

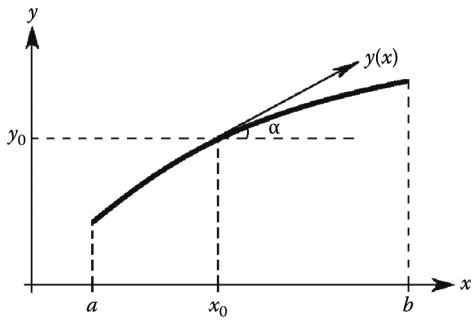


FIGURE 2.2

Four particular solutions for different initial conditions. Dashed line is the vertical asymptote $x = -C_2/C_1 = 1.5$.

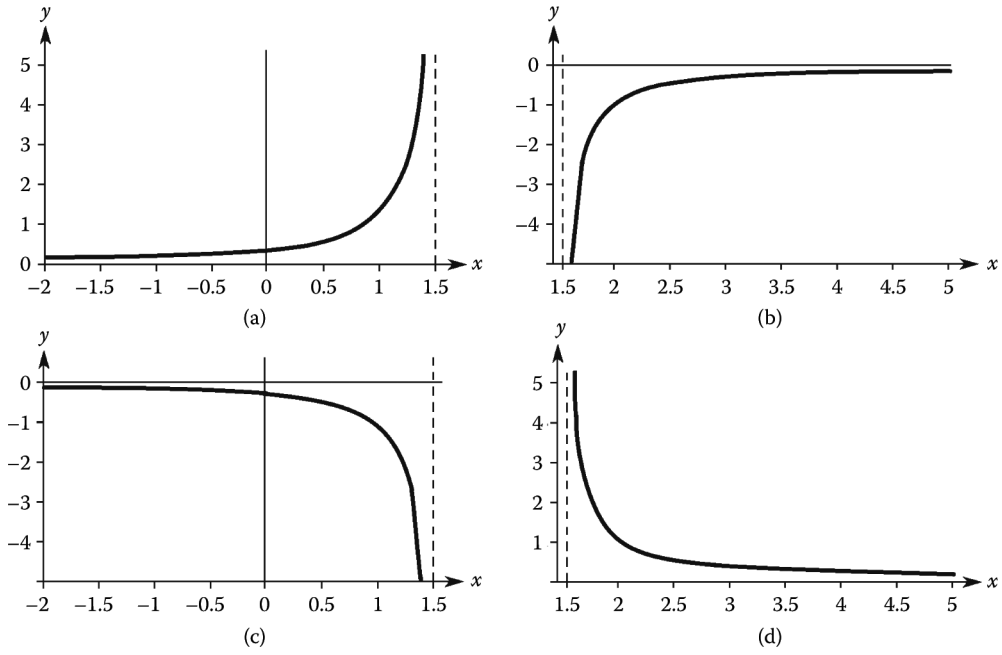


FIGURE 2.3

Starting interface of the program **ODE 2nd order**.

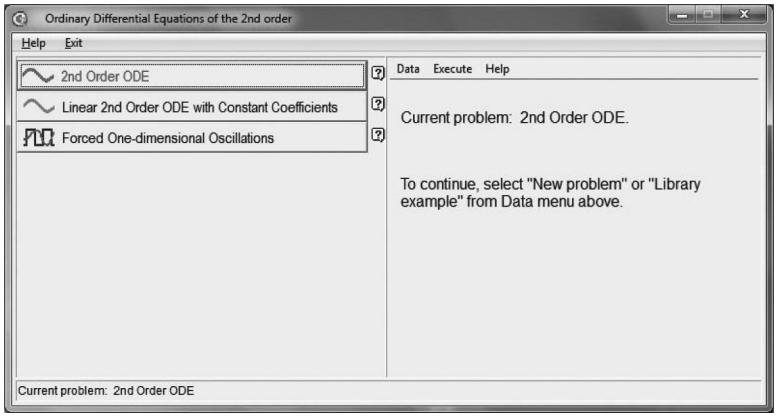


FIGURE 2.4

Equation $yy'' - 2y'^2 = 0$ with initial conditions $y(1) = -1$, $y'(1) = 2$.

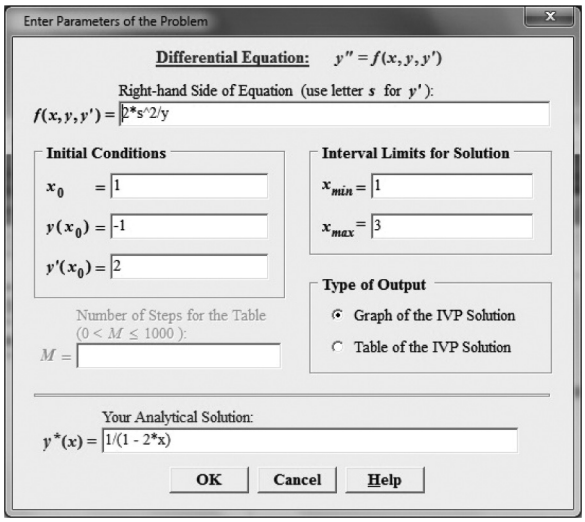


FIGURE 2.5

Graph of the solution of equation $yy'' - 2y'^2 = 0$ with initial conditions $y(1) = -1$, $y'(1) = 2$.

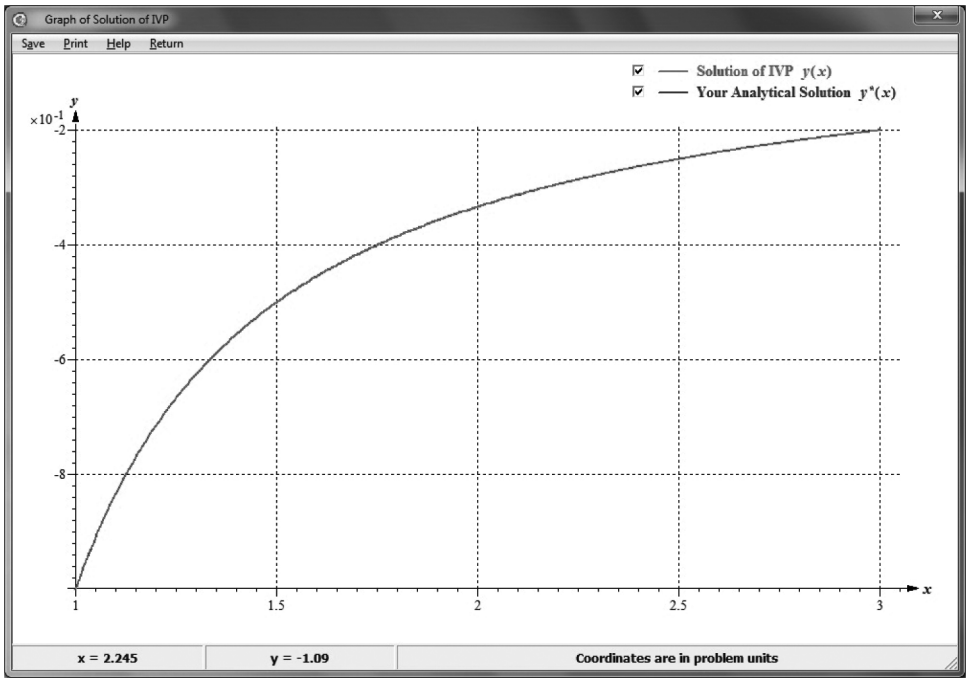
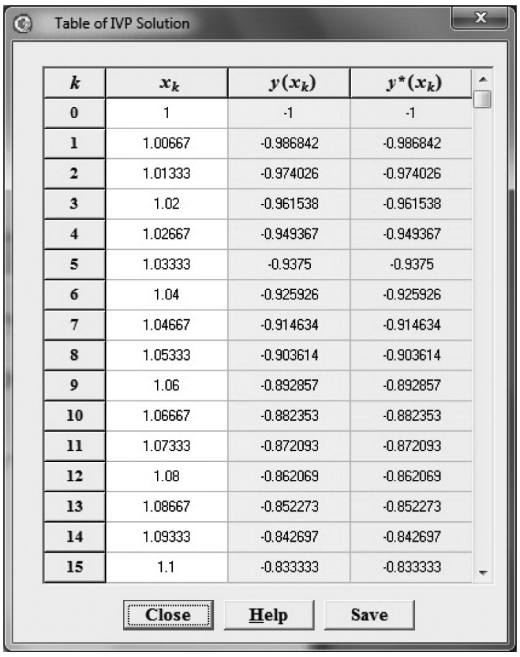


FIGURE 2.6

Solution of equation $yy'' - 2y'^2 = 0$ with initial conditions $y(1) = -1$, $y'(1) = 2$ presented in the table form.



k	x_k	$y(x_k)$	$y^*(x_k)$
0	1	-1	-1
1	1.00667	-0.986842	-0.986842
2	1.01333	-0.974026	-0.974026
3	1.02	-0.961538	-0.961538
4	1.02667	-0.949367	-0.949367
5	1.03333	-0.9375	-0.9375
6	1.04	-0.925926	-0.925926
7	1.04667	-0.914634	-0.914634
8	1.05333	-0.903614	-0.903614
9	1.06	-0.892857	-0.892857
10	1.06667	-0.882353	-0.882353
11	1.07333	-0.872093	-0.872093
12	1.08	-0.862069	-0.862069
13	1.08667	-0.852273	-0.852273
14	1.09333	-0.842697	-0.842697
15	1.1	-0.833333	-0.833333

FIGURE 2.7

Equation $y'' + y = \sin x + x$ with initial conditions $y(0) = 1$, $y'(0) = 0$.

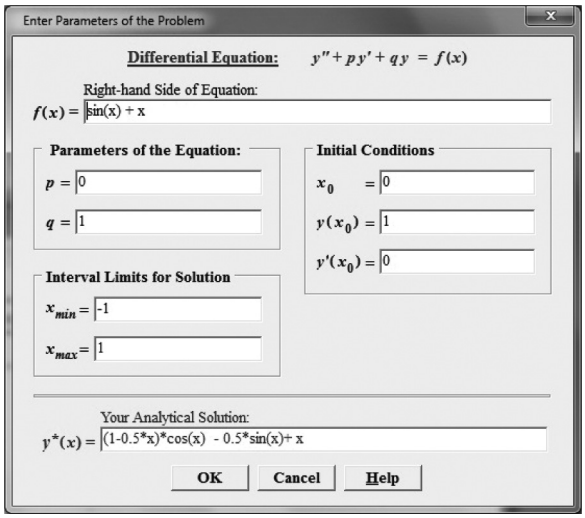


FIGURE 2.8

Example 2.25. IVP solution: analytical and numerical.

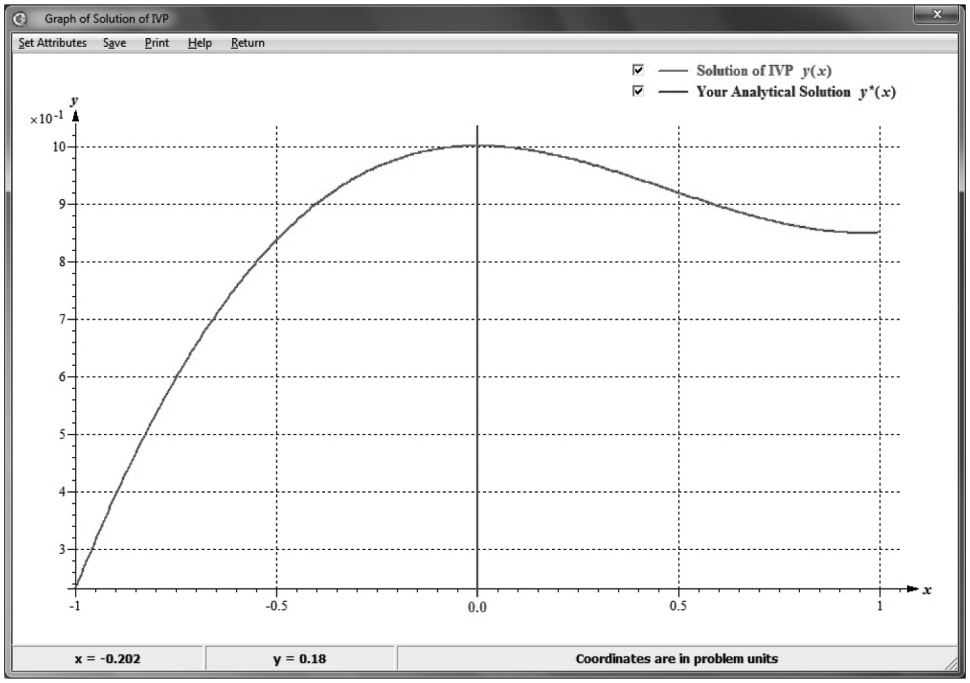
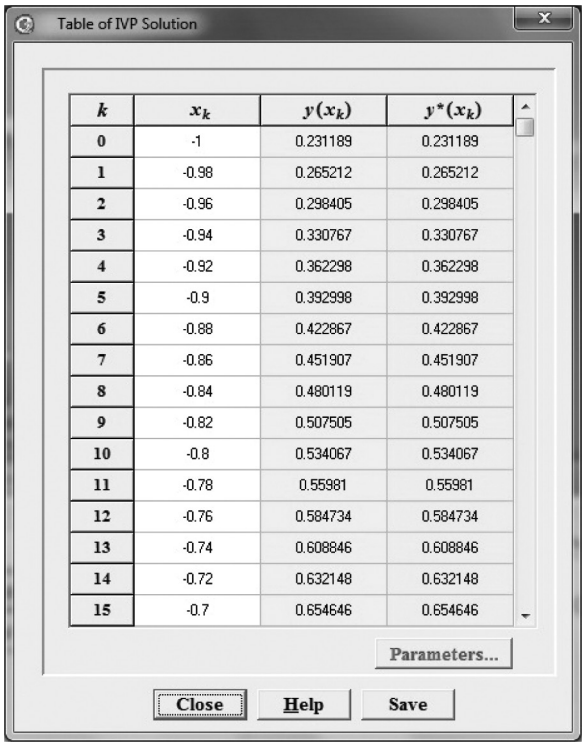


FIGURE 2.9

Example 2.25. Solution of IVP presented in the table form.



k	x_k	$y(x_k)$	$y^*(x_k)$
0	-1	0.231189	0.231189
1	-0.98	0.265212	0.265212
2	-0.96	0.298405	0.298405
3	-0.94	0.330767	0.330767
4	-0.92	0.362298	0.362298
5	-0.9	0.392998	0.392998
6	-0.88	0.422867	0.422867
7	-0.86	0.451907	0.451907
8	-0.84	0.480119	0.480119
9	-0.82	0.507505	0.507505
10	-0.8	0.534067	0.534067
11	-0.78	0.55981	0.55981
12	-0.76	0.584734	0.584734
13	-0.74	0.608846	0.608846
14	-0.72	0.632148	0.632148
15	-0.7	0.654646	0.654646

FIGURE 2.10

Example 2.25. Graphs of the fundamental solutions of equation $y'' + y = \sin x + x$.