

EULER METHOD

t	phi(t)	error: h=0.1	error: h=0.01	error: h=0.001
0.00	1.0000	0.000000000000	0.000000000000	0.000000000000
0.10	1.6090	0.109041828449	0.013751740108	0.001412901742
0.20	2.5053	0.315329852585	0.040871120233	0.004213922341
0.30	3.8301	0.684138845750	0.091104302592	0.009425890302
0.40	5.7942	1.319826003969	0.180514008294	0.018741559897
1.00	64.8978	30.486312885959	4.860677195539	0.515245173845
2.00	3540.2001	2546.327076436795	510.872232685863	56.039306535802

IMPROVED EULER METHOD (HEUN'S METHOD)

t	phi(t)	error: h=0.1	error: h=0.01	error: h=0.001
0.00	1.0000	0.000000000000	0.000000000000	0.000000000000
0.10	1.6090	0.014041828449	0.000183376689	0.000001883984
0.20	2.5053	0.041729852585	0.000547103430	0.000005621144
0.30	3.8301	0.093010845750	0.001224210252	0.000012578635
0.40	5.7942	0.184276563969	0.002434950092	0.000025020145
1.00	64.8978	4.959579932511	0.067081377779	0.000689501491
2.00	3540.2001	520.854150633696	7.321248857906	0.075290611317

RUNGE-KUTTA METHOD

t	phi(t)	error: h=0.1	error: h=0.01	error: h=0.001
0.00	1.0000	0.000000000000	0.000000000000	0.000000000000
0.10	1.6090	0.000108495116	0.000000014622	0.000000000002
0.20	2.5053	0.000323701474	0.000000043626	0.000000000004
0.30	3.8301	0.000724336599	0.000000097624	0.000000000010
0.40	5.7942	0.001440733519	0.000000194184	0.000000000020
1.00	64.8978	0.039696355450	0.000005351317	0.000000000551
2.00	3540.2001	4.333368151289	0.000584343975	0.000000060213