1.

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python3 mai...   Ask Assistant   2s • 5 minutes ago

> Environment updated. Reloading shell...

t	Euler Approx	Taylor Approx	Exact Value	Euler Error	Taylor Error
1.00	0.000000	0.000000	0.000000	0.000000e+00	0.000000e+00
1.10	0.100000	0.105000	0.105160	5.159816e-03	1.598158e-04
1.20	0.209917	0.220919	0.221243	1.132542e-02	3.236151e-04
1.30	0.330471	0.348612	0.349121	1.865057e-02	5.087466e-04
1.40	0.462354	0.488954	0.489682	2.732812e-02	7.279102e-04
1.50	0.606285	0.642883	0.643875	3.758986e-02	9.925500e-04
1.60	0.763041	0.811438	0.812753	4.971125e-02	1.314566e-03
1.70	0.933475	0.995787	0.997494	6.401910e-02	1.707401e-03
1.80	1.118537	1.197252	1.199439	8.090191e-02	2.186918e-03
1.90	1.319293	1.417344	1.420116	1.008232e-01	2.772304e-03
2.00	1.536943	1.657795	1.661282	1.243385e-01	3.487094e-03

2.

python3 mai...

> Environment updated. Reloading shell...

結果 (h = 0.1) :

t	u1 (RK4)	u1 (exact)	u1 error	u2 (RK4)	u2 (exact)	u2 error
0.00	1.333333	1.333333	0.00e+00	0.666667	0.666667	1.11e-16
0.10	-3.052437	1.793063	4.85e+00	8.989305	-1.032002	1.00e+01
0.20	-23.847795	1.423902	2.53e+01	51.192704	-0.874681	5.21e+01
0.30	-130.165202	1.131577	1.31e+02	269.269193	-0.724999	2.70e+02
0.40	-680.231485	0.909409	6.81e+02	1399.368584	-0.608214	1.40e+03
0.50	-3531.299585	0.738788	3.53e+03	7258.241839	-0.515658	7.26e+03
0.60	-18312.795052	0.605710	1.83e+04	37634.955483	-0.440411	3.76e+04
0.70	-94951.331907	0.499860	9.50e+04	195131.871735	-0.377404	1.95e+05
0.80	-492306.465639	0.413671	4.92e+05	1011721.872078	-0.322954	1.01e+06
0.90	-2552513.623867	0.341614	2.55e+06	5245578.826590	-0.274409	5.25e+06
1.00	-13234278.789168	0.279675	1.32e+07	27197287.206587	-0.229888	2.72e+07

結果 (h = 0.05) :

t	u1 (RK4)	u1 (exact)	u1 error	u2 (RK4)	u2 (exact)	u2 error
0.00	1.333333	1.333333	0.00e+00	0.666667	0.666667	1.11e-16
0.05	1.721880	1.912059	1.90e-01	-0.499599	-0.909077	4.09e-01
0.10	1.726915	1.793063	6.61e-02	-0.832598	-1.032002	1.99e-01
0.15	1.617161	1.601967	1.52e-02	-0.890373	-0.961459	7.11e-02
0.20	1.481687	1.423902	5.78e-02	-0.861042	-0.874681	1.36e-02
0.25	1.348945	1.267646	8.13e-02	-0.807505	-0.795221	1.23e-02
0.30	1.227063	1.131577	9.55e-02	-0.750341	-0.724999	2.53e-02
0.35	1.117478	1.012999	1.04e-01	-0.695886	-0.663060	3.28e-02
0.40	1.019525	0.909409	1.10e-01	-0.645732	-0.608214	3.75e-02
0.45	0.931977	0.818630	1.13e-01	-0.599934	-0.559389	4.05e-02
0.50	0.853541	0.738788	1.15e-01	-0.558092	-0.515658	4.24e-02
0.55	0.783017	0.668275	1.15e-01	-0.519706	-0.476225	4.35e-02
0.60	0.719337	0.605710	1.14e-01	-0.484290	-0.440411	4.39e-02
0.65	0.661560	0.549909	1.12e-01	-0.451407	-0.407635	4.38e-02
0.70	0.608868	0.499860	1.09e-01	-0.420673	-0.377404	4.33e-02
0.75	0.560547	0.454695	1.06e-01	-0.391754	-0.349296	4.25e-02
0.80	0.515980	0.413671	1.02e-01	-0.364365	-0.322954	4.14e-02
0.85	0.474633	0.376158	9.85e-02	-0.338259	-0.298076	4.02e-02
0.90	0.436043	0.341614	9.44e-02	-0.313226	-0.274409	3.88e-02
0.95	0.399812	0.309583	9.02e-02	-0.289089	-0.251739	3.74e-02
1.00	0.365600	0.279675	8.59e-02	-0.265698	-0.229888	3.58e-02