

$u = x(x-1)^2$ with DE $-u_{xx} + u = x^3 - 2x^2 - 5x + 4$ on $[0, 1]$

D6

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.617050e-02		1.131598e+03	0.000063
0.250000	6.872969e-03	2.674073	1.565085e+03	0.000050
0.125000	8.052844e-03	-0.237644	3.808061e+03	0.000067
0.062500	2.650689e-03	1.481607	1.280367e+04	0.000081
0.031250	6.527349e-04	1.751755	6.273596e+04	0.000154
0.015625	1.337674e-04	1.902082	3.279182e+05	0.000342
0.007812	2.825589e-05	1.813934	1.777962e+06	0.001766
0.003906	1.653564e-05	0.612324	9.837457e+06	0.009866
0.001953	1.062731e-05	0.497352	5.502172e+07	0.054704

D8

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	1.961832e-02		2.570877e+03	0.000074
0.250000	2.281490e-02	-0.301900	2.277282e+03	0.000068
0.125000	7.453373e-03	1.678121	4.454572e+03	0.000073
0.062500	1.880761e-03	1.835987	1.274885e+04	0.000109
0.031250	4.719789e-04	1.728122	5.323901e+04	0.000153
0.015625	1.204125e-04	1.639213	2.702692e+05	0.000341
0.007812	3.162757e-05	1.559710	1.441716e+06	0.001797
0.003906	8.727428e-06	1.471496	7.907208e+06	0.010987
0.001953	2.608931e-06	1.358472	4.402290e+07	0.049096

D10

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.637977e-02		6.672527e+03	0.000084
0.250000	2.378861e-02	0.206781	3.642506e+03	0.000081
0.125000	5.830260e-03	2.109218	5.757604e+03	0.000085
0.062500	1.398883e-03	1.903184	1.470227e+04	0.000113
0.031250	3.416783e-04	1.761949	5.251371e+04	0.000176
0.015625	8.481212e-05	1.672117	2.595958e+05	0.000389
0.007812	2.136594e-05	1.608413	1.364211e+06	0.002011
0.003906	5.484406e-06	1.554159	7.420923e+06	0.010091
0.001953	1.451209e-06	1.495701	4.113628e+07	0.057919

D12

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.825079e-02		1.782620e+04	0.000091
0.250000	2.242574e-02	0.461823	5.948582e+03	0.000096
0.125000	5.023571e-03	2.244103	7.559087e+03	0.000090
0.062500	1.186381e-03	1.924311	1.736247e+04	0.000124
0.031250	2.870392e-04	1.773806	5.457434e+04	0.000183
0.015625	7.056916e-05	1.683631	2.601852e+05	0.000399
0.007812	1.752006e-05	1.625455	1.347933e+06	0.002016
0.003906	4.379447e-06	1.584485	7.274457e+06	0.009910
0.001953	1.102264e-06	1.552001	4.015357e+07	0.056216

D14

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.875876e-02		4.816307e+04	0.000099
0.250000	2.087703e-02	0.640586	9.778351e+03	0.000089
0.125000	4.578348e-03	2.275967	9.916494e+03	0.000106
0.062500	1.074575e-03	1.932551	2.054746e+04	0.000140
0.031250	2.590963e-04	1.778101	6.064749e+04	0.000199
0.015625	6.354354e-05	1.686569	2.648618e+05	0.000465
0.007812	1.573289e-05	1.628634	1.353403e+06	0.002204
0.003906	3.915612e-06	1.589465	7.247818e+06	0.010211
0.001953	9.775563e-07	1.561130	3.983999e+07	0.062803

D16

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.875458e-02		1.307104e+05	0.000112
0.250000	1.953769e-02	0.772903	1.611174e+04	0.000110
0.125000	4.304672e-03	2.268967	1.295324e+04	0.000124
0.062500	1.007427e-03	1.936402	2.421893e+04	0.000152
0.031250	2.425180e-04	1.780098	6.741897e+04	0.000218
0.015625	5.942464e-05	1.687641	2.712849e+05	0.000459
0.007812	1.470367e-05	1.629380	1.367819e+06	0.002080
0.003906	3.656868e-06	1.590275	7.270019e+06	0.010764
0.001953	9.118989e-07	1.562437	3.979817e+07	0.044918

D18

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.853791e-02		3.553592e+05	0.000131
0.250000	1.844944e-02	0.872398	2.657072e+04	0.000123
0.125000	4.122947e-03	2.247699	1.684561e+04	0.000148
0.062500	9.632227e-04	1.938719	2.838944e+04	0.000170
0.031250	2.316842e-04	1.781137	7.475731e+04	0.000259
0.015625	5.674568e-05	1.688155	2.785348e+05	0.000542
0.007812	1.403745e-05	1.629659	1.386176e+06	0.002306
0.003906	3.490602e-06	1.590462	7.313438e+06	0.011027
0.001953	8.702753e-07	1.562647	3.987398e+07	0.065179

D20

h	Euclidean Error	Convergence rate	Condition Number	Average Com putation time
0.500000	2.823885e-02		9.667048e+05	0.000142
0.250000	1.757708e-02	0.948206	4.383267e+04	0.000138
0.125000	3.994670e-03	2.222452	2.182858e+04	0.000150
0.062500	9.320664e-04	1.940416	3.309819e+04	0.000184
0.031250	2.240933e-04	1.781677	8.261245e+04	0.000277
0.015625	5.487454e-05	1.688416	2.862220e+05	0.000551
0.007812	1.357307e-05	1.629788	1.406345e+06	0.002215
0.003906	3.374927e-06	1.590530	7.366389e+06	0.010990
0.001953	8.414475e-07	1.562631	4.000241e+07	0.069756