In this tests we will consider this two attempts: In this test we will consider:

Figure 1: Old attempt.

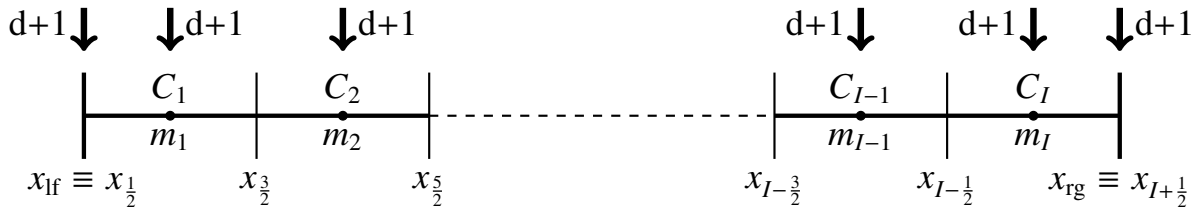

Figure 2: New attempt.

- $\psi(x) = \exp(x)$
- $\psi_{\mathrm{l}} = 1$;
- $\psi_{\mathrm{ll}} = 1$;
- $\psi_{\mathrm{r}} = 1$;
- $\psi_{\mathrm{rr}} = 1$;
- $g(x) = -\exp(x)$.

Table 1: Test of 01_01 with d and d+1 ($\exp(x)$ — constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.09E−05	—	1.72E−05	—	8.41E−06	—	1.36E−05	—
	100	1.34E−06	3.02	2.10E−06	3.03	1.02E−06	3.04	1.65E−06	3.04
	150	3.84E−07	3.08	5.99E−07	3.09	2.92E−07	3.10	4.68E−07	3.11
	200	1.57E−07	3.12	2.43E−07	3.14	1.17E−07	3.16	1.88E−07	3.16
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	2.46E−06	—	3.97E−06	—	1.55E−06	—	2.39E−06	—
	100	2.55E−07	3.27	4.01E−07	3.31	1.57E−07	3.31	2.20E−07	3.44
	150	6.01E−08	3.56	9.68E−08	3.51	3.33E−08	3.82	4.71E−08	3.80
	200	1.91E−08	3.99	3.38E−08	3.65	8.23E−09	4.86	1.53E−08	3.91
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	3.38E−06	—	6.75E−06	—	1.31E−06	—	2.11E−06	—
	100	6.77E−07	2.32	1.22E−06	2.47	1.43E−07	3.19	2.23E−07	3.24
	150	2.40E−07	2.56	4.14E−07	2.67	3.09E−08	3.77	5.31E−08	3.54
	200	1.10E−07	2.71	1.85E−07	2.79	7.66E−09	4.85	1.84E−08	3.69
$\mathbb{P}_4$	50	3.85E−07	—	7.68E−07	—	3.08E−07	—	6.06E−07	—
	100	1.11E−07	1.79	2.10E−07	1.87	9.29E−08	1.73	1.76E−07	1.78
	150	5.07E−08	1.93	9.53E−08	1.95	4.28E−08	1.91	8.06E−08	1.93
	200	2.88E−08	1.97	5.42E−08	1.96	2.44E−08	1.95	4.59E−08	1.95
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	4.20E−07	—	8.21E−07	—	3.66E−07	—	6.95E−07	—
	100	1.14E−07	1.88	2.14E−07	1.94	9.70E−08	1.92	1.82E−07	1.93
	150	5.10E−08	1.98	9.59E−08	1.99	4.36E−08	1.97	8.19E−08	1.98
	200	2.89E−08	1.97	5.44E−08	1.97	2.46E−08	2.00	4.61E−08	2.00
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	4.32E−07	—	8.31E−07	—	3.75E−07	—	7.09E−07	—
	100	1.14E−07	1.92	2.15E−07	1.95	9.76E−08	1.94	1.83E−07	1.95
	150	5.14E−08	1.97	9.64E−08	1.98	4.37E−08	1.98	8.21E−08	1.98
	200	2.90E−08	1.99	5.44E−08	1.99	2.46E−08	2.00	4.62E−08	2.00
$\mathbb{P}_5$	50	1.51E−09	—	2.16E−09	—	9.32E−10	—	1.46E−09	—
	100	3.51E−11	5.42	5.35E−11	5.34	2.82E−11	5.05	4.55E−11	5.00
	150	1.03E−12	8.69	2.29E−12	7.77	4.31E−12	4.64	8.16E−12	4.24
	200	7.66E−12	↑	1.72E−11	↑	1.27E−11	↑	2.52E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	7.22E−10	—	9.92E−10	—	6.77E−10	—	1.02E−09	—
	100	2.13E−11	5.09	3.29E−11	4.92	2.12E−11	4.99	3.32E−11	4.94
	150	1.51E−12	6.52	3.26E−12	5.70	5.91E−12	3.16	1.34E−11	2.24
	200	3.63E−12	↑	7.61E−12	↑	1.02E−11	↑	1.79E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	1.59E−09	—	2.43E−09	—	5.19E−10	—	8.43E−10	—
	100	2.91E−11	5.78	4.46E−11	5.77	1.53E−11	5.08	2.45E−11	5.10
	150	4.40E−12	4.66	7.42E−12	4.42	2.38E−12	4.59	5.77E−12	3.57
	200	6.46E−12	↑	1.27E−11	↑	6.74E−12	↑	1.58E−11	↑

Table 2: Test of 01_01 with d and d+1 ($\exp(x)$ — non-constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.14E−05	—	1.79E−05	—	7.04E−06	—	1.05E−05	—
	100	1.30E−06	3.13	2.02E−06	3.15	6.72E−07	3.39	9.69E−07	3.44
	150	3.35E−07	3.35	5.18E−07	3.35	1.30E−07	4.05	2.12E−07	3.75
	200	1.18E−07	3.62	1.88E−07	3.53	2.65E−08	5.53	6.98E−08	3.85
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	1.95E−06	—	3.29E−06	—	1.14E−06	—	2.34E−06	—
	100	7.65E−08	4.67	2.33E−07	3.82	1.40E−07	3.03	3.01E−07	2.96
	150	5.94E−08	0.62	1.34E−07	1.37	1.03E−07	0.75	2.21E−07	0.76
	200	4.77E−08	0.77	1.03E−07	0.91	7.27E−08	1.22	1.50E−07	1.35
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	1.40E−06	—	2.30E−06	—	3.20E−07	—	8.76E−07	—
	100	2.42E−07	2.53	4.06E−07	2.50	2.10E−07	0.61	4.63E−07	0.92
	150	6.95E−08	3.08	1.36E−07	2.70	1.28E−07	1.22	2.66E−07	1.37
	200	2.25E−08	3.91	6.02E−08	2.83	8.32E−08	1.49	1.68E−07	1.60
$\mathbb{P}_4$	50	7.17E−08	—	1.61E−07	—	7.74E−08	—	1.31E−07	—
	100	3.09E−08	1.22	6.13E−08	1.39	2.80E−08	1.46	5.46E−08	1.26
	150	1.64E−08	1.55	3.16E−08	1.64	1.44E−08	1.65	2.75E−08	1.70
	200	1.01E−08	1.68	1.96E−08	1.66	8.52E−09	1.82	1.61E−08	1.84
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	1.50E−07	—	3.32E−07	—	7.32E−08	—	1.47E−07	—
	100	3.93E−08	1.94	7.45E−08	2.16	3.03E−08	1.27	5.84E−08	1.33
	150	1.69E−08	2.08	3.24E−08	2.05	1.49E−08	1.75	2.83E−08	1.78
	200	1.46E−08	0.51	2.67E−08	0.68	8.69E−09	1.87	1.64E−08	1.89
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	9.44E−08	—	2.11E−07	—	1.04E−07	—	2.05E−07	—
	100	3.74E−08	1.34	7.21E−08	1.55	3.29E−08	1.66	6.27E−08	1.71
	150	1.82E−08	1.77	3.44E−08	1.82	1.54E−08	1.87	2.92E−08	1.89
	200	1.02E−08	2.00	1.94E−08	1.98	8.86E−09	1.93	1.67E−08	1.94
$\mathbb{P}_5$	50	2.80E−09	—	4.63E−09	—	2.25E−09	—	3.76E−09	—
	100	1.17E−10	4.59	2.01E−10	4.53	1.07E−10	4.40	1.87E−10	4.33
	150	1.88E−11	4.50	3.31E−11	4.44	1.94E−11	4.20	3.49E−11	4.14
	200	4.60E−12	4.89	8.42E−12	4.76	7.54E−12	3.29	1.35E−11	3.29
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	2.33E−09	—	3.90E−09	—	2.37E−09	—	4.00E−09	—
	100	9.65E−11	4.59	1.68E−10	4.53	1.08E−10	4.46	1.89E−10	4.40
	150	1.44E−11	4.69	2.57E−11	4.64	1.74E−11	4.49	3.10E−11	4.47
	200	5.38E−12	3.42	9.70E−12	3.39	6.21E−12	3.58	1.08E−11	3.66
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	5.59E−10	—	1.10E−09	—	2.00E−10	—	4.56E−10	—
	100	1.42E−11	5.30	2.71E−11	5.34	3.09E−11	2.69	6.53E−11	2.80
	150	5.27E−12	2.45	1.12E−11	2.17	9.05E−12	3.03	1.83E−11	3.13
	200	1.76E−12	3.82	3.66E−12	3.89	1.26E−11	↑	2.47E−11	↑

In this test we will consider:

- $\psi(x) = -\exp(x) + \mathbb{P}_3$
- $\psi_{\mathrm{l}} = 0$;
- $\psi_{\mathrm{ll}} = 0$;
- $\psi_{\mathrm{r}} = 0$;
- $\psi_{\mathrm{rr}} = 0$;
- $g(x) = \exp(x)$.

Table 3: Test of 01_01 with d and d+1 ($\exp(x) + \mathbb{P}_3$ — constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.09E−05	—	1.72E−05	—	8.41E−06	—	1.36E−05	—
	100	1.34E−06	3.02	2.10E−06	3.03	1.02E−06	3.04	1.65E−06	3.04
	150	3.84E−07	3.08	5.99E−07	3.09	2.92E−07	3.10	4.68E−07	3.11
	200	1.56E−07	3.12	2.43E−07	3.14	1.17E−07	3.16	1.88E−07	3.16
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	2.46E−06	—	3.97E−06	—	1.55E−06	—	2.39E−06	—
	100	2.55E−07	3.27	4.01E−07	3.31	1.57E−07	3.31	2.20E−07	3.44
	150	6.01E−08	3.56	9.68E−08	3.51	3.33E−08	3.82	4.71E−08	3.80
	200	1.91E−08	3.99	3.38E−08	3.65	8.23E−09	4.86	1.53E−08	3.91
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	3.38E−06	—	6.75E−06	—	1.31E−06	—	2.11E−06	—
	100	6.77E−07	2.32	1.22E−06	2.47	1.43E−07	3.19	2.23E−07	3.24
	150	2.40E−07	2.56	4.14E−07	2.67	3.09E−08	3.77	5.31E−08	3.54
	200	1.10E−07	2.71	1.85E−07	2.79	7.65E−09	4.86	1.84E−08	3.69
$\mathbb{P}_4$	50	3.85E−07	—	7.68E−07	—	3.08E−07	—	6.06E−07	—
	100	1.11E−07	1.79	2.10E−07	1.87	9.29E−08	1.73	1.76E−07	1.78
	150	5.07E−08	1.93	9.53E−08	1.95	4.28E−08	1.91	8.06E−08	1.93
	200	2.88E−08	1.97	5.42E−08	1.96	2.44E−08	1.96	4.58E−08	1.96
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	4.20E−07	—	8.21E−07	—	3.66E−07	—	6.95E−07	—
	100	1.14E−07	1.88	2.14E−07	1.94	9.70E−08	1.92	1.82E−07	1.93
	150	5.10E−08	1.98	9.59E−08	1.99	4.36E−08	1.97	8.19E−08	1.98
	200	2.89E−08	1.97	5.44E−08	1.97	2.46E−08	1.99	4.62E−08	1.99
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	4.32E−07	—	8.31E−07	—	3.75E−07	—	7.09E−07	—
	100	1.14E−07	1.92	2.15E−07	1.95	9.76E−08	1.94	1.83E−07	1.95
	150	5.14E−08	1.97	9.65E−08	1.98	4.37E−08	1.98	8.21E−08	1.98
	200	2.90E−08	1.99	5.44E−08	1.99	2.47E−08	1.99	4.63E−08	1.99
$\mathbb{P}_5$	50	1.51E−09	—	2.16E−09	—	9.32E−10	—	1.46E−09	—
	100	3.58E−11	5.40	5.45E−11	5.31	2.95E−11	4.98	4.73E−11	4.94
	150	5.37E−12	4.68	8.57E−12	4.56	3.40E−12	5.34	5.39E−12	5.36
	200	4.18E−12	0.87	7.61E−12	0.41	1.79E−12	2.22	3.01E−12	2.03
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	7.22E−10	—	9.92E−10	—	6.77E−10	—	1.02E−09	—
	100	1.88E−11	5.27	2.85E−11	5.12	2.08E−11	5.02	3.24E−11	4.98
	150	2.91E−12	4.60	4.68E−12	4.45	3.15E−12	4.66	5.10E−12	4.56
	200	2.57E−12	0.43	4.65E−12	0.02	6.22E−13	5.64	1.04E−12	5.52
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	1.59E−09	—	2.43E−09	—	5.20E−10	—	8.44E−10	—
	100	2.90E−11	5.78	4.43E−11	5.77	1.65E−11	4.97	2.61E−11	5.01
	150	3.01E−12	5.59	4.50E−12	5.64	1.32E−12	6.24	2.14E−12	6.17
	200	1.59E−12	2.23	3.04E−12	1.36	5.35E−12	↑	9.87E−12	↑

Table 4: Test of 01_01 with d and d+1 ($\exp(x) + \mathbb{P}_3$ — non-constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.14E−05	—	1.79E−05	—	7.04E−06	—	1.05E−05	—
	100	1.30E−06	3.13	2.02E−06	3.15	6.72E−07	3.39	9.69E−07	3.44
	150	3.35E−07	3.35	5.18E−07	3.35	1.30E−07	4.05	2.12E−07	3.75
	200	1.18E−07	3.62	1.88E−07	3.53	2.65E−08	5.53	6.98E−08	3.85
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	1.95E−06	—	3.29E−06	—	1.14E−06	—	2.34E−06	—
	100	7.65E−08	4.67	2.33E−07	3.82	1.40E−07	3.03	3.01E−07	2.96
	150	5.94E−08	0.62	1.34E−07	1.37	1.03E−07	0.75	2.21E−07	0.76
	200	4.77E−08	0.77	1.03E−07	0.91	7.27E−08	1.22	1.50E−07	1.35
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	1.40E−06	—	2.30E−06	—	3.20E−07	—	8.76E−07	—
	100	2.42E−07	2.53	4.06E−07	2.50	2.10E−07	0.61	4.63E−07	0.92
	150	6.95E−08	3.08	1.36E−07	2.70	1.28E−07	1.22	2.66E−07	1.37
	200	2.25E−08	3.91	6.02E−08	2.83	8.32E−08	1.49	1.68E−07	1.60
$\mathbb{P}_4$	50	7.17E−08	—	1.61E−07	—	7.74E−08	—	1.31E−07	—
	100	3.09E−08	1.22	6.13E−08	1.39	2.80E−08	1.46	5.46E−08	1.26
	150	1.64E−08	1.55	3.16E−08	1.64	1.44E−08	1.65	2.75E−08	1.70
	200	1.01E−08	1.68	1.96E−08	1.66	8.52E−09	1.82	1.61E−08	1.85
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	1.50E−07	—	3.32E−07	—	7.32E−08	—	1.47E−07	—
	100	3.93E−08	1.94	7.45E−08	2.16	3.03E−08	1.27	5.84E−08	1.33
	150	1.69E−08	2.08	3.24E−08	2.05	1.49E−08	1.75	2.83E−08	1.78
	200	1.46E−08	0.51	2.67E−08	0.68	8.69E−09	1.87	1.64E−08	1.89
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	9.44E−08	—	2.11E−07	—	1.04E−07	—	2.05E−07	—
	100	3.74E−08	1.34	7.21E−08	1.55	3.29E−08	1.66	6.27E−08	1.71
	150	1.82E−08	1.77	3.44E−08	1.82	1.54E−08	1.87	2.92E−08	1.88
	200	1.02E−08	2.00	1.94E−08	1.98	8.86E−09	1.93	1.67E−08	1.94
$\mathbb{P}_5$	50	2.80E−09	—	4.63E−09	—	2.25E−09	—	3.76E−09	—
	100	1.17E−10	4.58	2.02E−10	4.52	1.07E−10	4.40	1.87E−10	4.33
	150	1.87E−11	4.53	3.28E−11	4.48	1.90E−11	4.25	3.39E−11	4.20
	200	6.09E−12	3.89	1.08E−11	3.85	4.71E−12	4.85	8.46E−12	4.83
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	2.33E−09	—	3.90E−09	—	2.37E−09	—	4.00E−09	—
	100	9.59E−11	4.60	1.67E−10	4.54	1.07E−10	4.47	1.89E−10	4.41
	150	1.61E−11	4.39	2.89E−11	4.33	1.84E−11	4.35	3.29E−11	4.31
	200	4.05E−12	4.81	7.24E−12	4.81	6.05E−12	3.86	1.10E−11	3.82
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	5.59E−10	—	1.10E−09	—	2.00E−10	—	4.56E−10	—
	100	1.37E−11	5.35	2.55E−11	5.43	3.11E−11	2.69	6.57E−11	2.79
	150	5.58E−12	2.21	1.19E−11	1.88	7.36E−12	3.55	1.50E−11	3.64
	200	1.15E−12	5.49	2.30E−12	5.71	6.08E−12	0.66	1.17E−11	0.86

In this test we will consider:

- $\psi(x) = \sin(x)$
- $\psi_{\mathrm{l}} = 0$;
- $\psi_{\mathrm{ll}} = 1$;
- $\psi_{\mathrm{r}} = \sin(1)$;
- $\psi_{\mathrm{rr}} = \cos(1)$;
- $g(x) = -\sin(x)$.

Table 5: Test of 01_01 with d and d+1 ($\sin(x)$ — constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	2.73E−06	—	4.84E−06	—	2.30E−06	—	4.05E−06	—
	100	3.57E−07	2.94	6.30E−07	2.94	3.03E−07	2.92	5.34E−07	2.92
	150	1.10E−07	2.91	1.93E−07	2.91	9.42E−08	2.89	1.65E−07	2.89
	200	4.80E−08	2.87	8.44E−08	2.88	4.15E−08	2.85	7.28E−08	2.86
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	7.68E−07	—	1.39E−06	—	4.76E−07	—	8.59E−07	—
	100	1.08E−07	2.83	1.91E−07	2.86	7.47E−08	2.67	1.33E−07	2.69
	150	3.57E−08	2.73	6.29E−08	2.74	2.63E−08	2.57	4.68E−08	2.57
	200	1.67E−08	2.64	2.94E−08	2.64	1.28E−08	2.50	2.29E−08	2.49
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	1.05E−06	—	2.41E−06	—	4.78E−07	—	8.80E−07	—
	100	2.09E−07	2.33	4.35E−07	2.47	7.92E−08	2.59	1.42E−07	2.63
	150	7.75E−08	2.44	1.53E−07	2.58	2.81E−08	2.55	5.01E−08	2.57
	200	3.76E−08	2.51	7.19E−08	2.62	1.37E−08	2.50	2.44E−08	2.50
$\mathbb{P}_4$	50	1.11E−07	—	2.30E−07	—	1.03E−07	—	2.05E−07	—
	100	3.12E−08	1.83	5.98E−08	1.94	2.71E−08	1.93	5.17E−08	1.99
	150	1.42E−08	1.94	2.70E−08	1.96	1.22E−08	1.97	2.31E−08	1.98
	200	8.08E−09	1.97	1.53E−08	1.97	6.92E−09	1.97	1.31E−08	1.98
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	1.19E−07	—	2.44E−07	—	9.83E−08	—	1.94E−07	—
	100	3.20E−08	1.90	6.09E−08	2.00	2.69E−08	1.87	5.13E−08	1.92
	150	1.43E−08	1.98	2.71E−08	1.99	1.22E−08	1.96	2.31E−08	1.97
	200	8.12E−09	1.97	1.54E−08	1.96	6.91E−09	1.97	1.31E−08	1.98
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	1.22E−07	—	2.40E−07	—	1.03E−07	—	2.00E−07	—
	100	3.21E−08	1.93	6.08E−08	1.98	2.73E−08	1.92	5.17E−08	1.95
	150	1.44E−08	1.97	2.73E−08	1.98	1.22E−08	1.97	2.31E−08	1.98
	200	8.14E−09	1.99	1.54E−08	1.99	6.86E−09	2.01	1.29E−08	2.02
$\mathbb{P}_5$	50	3.37E−10	—	5.16E−10	—	2.20E−10	—	3.75E−10	—
	100	6.59E−12	5.68	1.09E−11	5.56	6.92E−12	4.99	1.17E−11	5.01
	150	1.13E−12	4.35	1.90E−12	4.31	1.08E−12	4.59	1.90E−12	4.47
	200	6.04E−13	2.18	1.45E−12	0.94	4.82E−12	↑	1.18E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	1.49E−10	—	2.39E−10	—	1.41E−10	—	2.37E−10	—
	100	2.88E−12	5.69	5.23E−12	5.52	3.53E−12	5.32	6.26E−12	5.24
	150	4.39E−13	4.64	8.58E−13	4.46	1.17E−12	2.73	2.50E−12	2.27
	200	3.73E−13	0.57	5.76E−13	1.38	1.14E−12	0.09	2.11E−12	0.59
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	4.06E−10	—	6.44E−10	—	1.46E−10	—	2.60E−10	—
	100	8.36E−12	5.60	1.39E−11	5.53	5.27E−12	4.79	9.29E−12	4.81
	150	7.76E−13	5.86	1.23E−12	5.97	3.87E−13	6.44	7.53E−13	6.20
	200	2.47E−12	↑	4.43E−12	↑	5.13E−12	↑	9.48E−12	↑

Table 6: Test of 01_01 with d and d+1 ($\sin(x)$ — non-constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.99E−06	—	3.18E−06	—	1.66E−06	—	2.69E−06	—
	100	2.87E−07	2.79	4.71E−07	2.75	2.57E−07	2.69	4.26E−07	2.66
	150	1.00E−07	2.59	1.68E−07	2.54	9.33E−08	2.50	1.58E−07	2.45
	200	4.93E−08	2.47	8.39E−08	2.41	4.69E−08	2.39	8.06E−08	2.34
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	8.43E−07	—	1.44E−06	—	7.38E−07	—	1.31E−06	—
	100	1.59E−07	2.41	2.82E−07	2.35	1.50E−07	2.30	2.73E−07	2.26
	150	6.44E−08	2.23	1.16E−07	2.19	6.26E−08	2.16	1.15E−07	2.13
	200	3.46E−08	2.16	6.30E−08	2.13	3.41E−08	2.11	6.32E−08	2.08
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	1.27E−06	—	2.25E−06	—	7.26E−07	—	1.28E−06	—
	100	2.46E−07	2.37	4.21E−07	2.42	1.53E−07	2.25	2.76E−07	2.22
	150	9.37E−08	2.38	1.61E−07	2.38	6.35E−08	2.16	1.16E−07	2.13
	200	4.78E−08	2.34	8.23E−08	2.32	3.45E−08	2.12	6.38E−08	2.09
$\mathbb{P}_4$	50	3.03E−07	—	6.50E−07	—	2.79E−07	—	5.61E−07	—
	100	1.08E−07	1.48	2.08E−07	1.65	9.37E−08	1.57	1.79E−07	1.65
	150	5.15E−08	1.83	9.74E−08	1.87	4.41E−08	1.86	8.33E−08	1.88
	200	2.99E−08	1.89	5.66E−08	1.88	2.54E−08	1.93	4.77E−08	1.94
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	4.29E−07	—	8.48E−07	—	3.23E−07	—	6.31E−07	—
	100	1.18E−07	1.86	2.22E−07	1.93	9.73E−08	1.73	1.84E−07	1.78
	150	5.22E−08	2.01	9.85E−08	2.01	4.49E−08	1.91	8.45E−08	1.92
	200	3.41E−08	1.47	6.30E−08	1.55	2.56E−08	1.95	4.81E−08	1.96
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	3.98E−07	—	7.89E−07	—	3.65E−07	—	7.00E−07	—
	100	1.16E−07	1.77	2.20E−07	1.84	1.00E−07	1.87	1.89E−07	1.89
	150	5.35E−08	1.92	1.01E−07	1.93	4.55E−08	1.95	8.55E−08	1.96
	200	3.02E−08	1.99	5.67E−08	1.99	2.58E−08	1.97	4.84E−08	1.98
$\mathbb{P}_5$	50	2.20E−10	—	3.18E−10	—	1.69E−10	—	2.60E−10	—
	100	3.96E−12	5.79	6.72E−12	5.57	4.98E−12	5.08	9.47E−12	4.78
	150	7.33E−13	4.16	1.72E−12	3.36	2.48E−12	1.72	4.76E−12	1.70
	200	5.79E−12	↑	1.10E−11	↑	5.93E−12	↑	1.29E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	1.55E−10	—	2.23E−10	—	1.60E−10	—	2.45E−10	—
	100	2.00E−12	6.28	4.15E−12	5.75	2.26E−12	6.15	4.67E−12	5.71
	150	3.96E−13	4.00	9.29E−13	3.69	5.67E−12	↑	1.13E−11	↑
	200	4.07E−12	↑	7.61E−12	↑	3.66E−12	1.52	7.71E−12	1.33
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	1.49E−10	—	2.48E−10	—	7.00E−11	—	1.35E−10	—
	100	3.89E−12	5.26	7.28E−12	5.09	1.40E−12	5.65	3.62E−12	5.22
	150	1.78E−12	1.93	3.17E−12	2.05	2.82E−12	↑	5.65E−12	↑
	200	4.48E−12	↑	8.97E−12	↑	1.37E−11	↑	2.69E−11	↑

In this test we will consider:

- $\psi(x) = x^4$
- $\psi_{\mathrm{l}} = 0$;
- $\psi_{\mathrm{ll}} = 0$;
- $\psi_{\mathrm{r}} = 1$;
- $\psi_{\mathrm{rr}} = 4$;
- $g(x) = -24$.

Table 7: Test of 01_01 with d and d+1 (x^4 — constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.47E−04	—	2.22E−04	—	1.08E−04	—	1.65E−04	—
	100	1.86E−05	2.98	2.80E−05	2.99	1.36E−05	2.98	2.07E−05	2.99
	150	5.54E−06	2.99	8.33E−06	2.99	4.06E−06	2.99	6.15E−06	3.00
	200	2.34E−06	2.99	3.52E−06	3.00	1.72E−06	2.99	2.60E−06	3.00
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	3.71E−05	—	5.71E−05	—	2.92E−05	—	4.67E−05	—
	100	4.56E−06	3.02	6.92E−06	3.04	3.81E−06	2.94	5.97E−06	2.97
	150	1.34E−06	3.03	2.02E−06	3.04	1.15E−06	2.97	1.78E−06	2.98
	200	5.61E−07	3.02	8.46E−07	3.03	4.87E−07	2.98	7.54E−07	2.99
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	4.90E−05	—	8.07E−05	—	2.34E−05	—	3.71E−05	—
	100	1.01E−05	2.28	1.59E−05	2.34	3.28E−06	2.84	5.05E−06	2.87
	150	3.68E−06	2.49	5.72E−06	2.53	1.01E−06	2.91	1.54E−06	2.93
	200	1.74E−06	2.60	2.68E−06	2.63	4.33E−07	2.94	6.60E−07	2.95
$\mathbb{P}_4$	50	2.53E−14	—	7.51E−14	—	9.54E−14	—	2.50E−13	—
	100	3.36E−13	↑	8.20E−13	↑	1.37E−11	↑	2.54E−11	↑
	150	2.57E−12	↑	5.02E−12	↑	7.51E−12	1.49	1.85E−11	0.78
	200	5.60E−12	↑	1.16E−11	↑	3.18E−10	↑	6.12E−10	↑
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	9.08E−14	—	1.83E−13	—	4.22E−13	—	8.47E−13	—
	100	2.42E−12	↑	4.59E−12	↑	1.56E−11	↑	3.01E−11	↑
	150	4.54E−12	↑	8.92E−12	↑	5.89E−12	2.41	1.48E−11	1.74
	200	1.50E−11	↑	2.85E−11	↑	4.64E−11	↑	1.01E−10	↑
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	1.14E−13	—	2.18E−13	—	5.82E−13	—	1.25E−12	—
	100	2.60E−13	↑	5.00E−13	↑	1.54E−11	↑	2.95E−11	↑
	150	3.38E−12	↑	7.08E−12	↑	6.94E−11	↑	1.34E−10	↑
	200	8.20E−12	↑	1.42E−11	↑	9.51E−11	↑	2.00E−10	↑
$\mathbb{P}_5$	50	3.22E−13	—	5.87E−13	—	5.88E−13	—	1.13E−12	—
	100	1.38E−12	↑	2.58E−12	↑	8.40E−12	↑	1.55E−11	↑
	150	2.86E−12	↑	7.08E−12	↑	8.22E−12	0.05	1.91E−11	↑
	200	9.51E−12	↑	1.67E−11	↑	2.18E−11	↑	4.34E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	4.43E−13	—	8.42E−13	—	1.45E−13	—	3.63E−13	—
	100	1.48E−12	↑	2.93E−12	↑	2.75E−13	↑	5.41E−13	↑
	150	5.15E−12	↑	1.13E−11	↑	7.38E−12	↑	1.84E−11	↑
	200	2.05E−12	3.20	4.53E−12	3.18	1.98E−11	↑	3.85E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	4.29E−13	—	7.83E−13	—	4.75E−13	—	9.54E−13	—
	100	2.86E−13	0.59	5.58E−13	0.49	1.00E−12	↑	2.38E−12	↑
	150	6.52E−12	↑	1.34E−11	↑	6.25E−12	↑	1.42E−11	↑
	200	1.01E−11	↑	2.54E−11	↑	8.59E−11	↑	1.62E−10	↑

Table 8: Test of 01_01 with d and d+1 (x^4 — non-constant mesh).

		$\omega = 1\|1$				$\omega = 1\|3$			
	I	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$	E_1	$\mathcal{O}_1$	E_∞	$\mathcal{O}_\infty$
$\mathbb{P}_3$	50	1.96E−04	—	3.38E−04	—	1.02E−04	—	1.73E−04	—
	100	2.03E−05	3.27	3.66E−05	3.20	5.90E−06	4.11	1.52E−05	3.51
	150	4.32E−06	3.82	9.03E−06	3.45	1.85E−06	2.86	3.41E−06	3.69
	200	1.08E−06	4.83	3.20E−06	3.61	1.50E−06	0.73	3.21E−06	0.21
$\mathbb{P}_3/\mathbb{P}_4$ (old)	50	1.74E−05	—	5.22E−05	—	1.38E−05	—	3.48E−05	—
	100	5.05E−06	1.79	1.11E−05	2.23	7.80E−06	0.82	1.65E−05	1.08
	150	3.31E−06	1.04	6.89E−06	1.17	4.55E−06	1.33	9.22E−06	1.44
	200	2.20E−06	1.42	4.44E−06	1.53	2.90E−06	1.57	5.74E−06	1.65
$\mathbb{P}_3/\mathbb{P}_4$ (new)	50	2.59E−05	—	5.48E−05	—	2.66E−05	—	5.84E−05	—
	100	5.02E−06	2.37	1.06E−05	2.37	1.02E−05	1.38	2.07E−05	1.50
	150	2.28E−06	1.95	4.82E−06	1.95	5.26E−06	1.64	1.04E−05	1.71
	200	1.38E−06	1.74	2.93E−06	1.74	3.19E−06	1.74	6.21E−06	1.79
$\mathbb{P}_4$	50	9.79E−14	—	1.86E−13	—	3.31E−13	—	6.33E−13	—
	100	2.92E−13	↑	5.95E−13	↑	1.49E−12	↑	2.86E−12	↑
	150	6.92E−13	↑	1.74E−12	↑	6.43E−12	↑	1.28E−11	↑
	200	2.41E−12	↑	5.94E−12	↑	1.15E−11	↑	2.73E−11	↑
$\mathbb{P}_4/\mathbb{P}_5$ (old)	50	5.64E−14	—	1.23E−13	—	6.20E−14	—	1.15E−13	—
	100	6.94E−13	↑	1.34E−12	↑	2.13E−12	↑	4.26E−12	↑
	150	1.60E−12	↑	3.41E−12	↑	5.21E−12	↑	1.12E−11	↑
	200	2.39E−12	↑	4.90E−12	↑	2.72E−11	↑	5.53E−11	↑
$\mathbb{P}_4/\mathbb{P}_5$ (new)	50	2.23E−13	—	4.42E−13	—	5.35E−13	—	1.01E−12	—
	100	2.84E−13	↑	5.32E−13	↑	9.65E−13	↑	2.16E−12	↑
	150	2.74E−12	↑	5.22E−12	↑	1.58E−12	↑	3.40E−12	↑
	200	2.92E−12	↑	6.70E−12	↑	3.81E−11	↑	7.19E−11	↑
$\mathbb{P}_5$	50	9.79E−14	—	1.57E−13	—	2.35E−13	—	4.91E−13	—
	100	2.09E−12	↑	4.13E−12	↑	4.17E−12	↑	8.43E−12	↑
	150	2.94E−12	↑	5.22E−12	↑	6.53E−12	↑	1.34E−11	↑
	200	1.15E−11	↑	2.48E−11	↑	2.09E−11	↑	4.12E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (old)	50	9.42E−14	—	1.69E−13	—	6.24E−13	—	1.21E−12	—
	100	2.25E−12	↑	4.30E−12	↑	3.95E−12	↑	7.44E−12	↑
	150	5.83E−13	3.33	1.60E−12	2.44	1.37E−11	↑	2.71E−11	↑
	200	2.71E−12	↑	6.11E−12	↑	1.97E−11	↑	4.26E−11	↑
$\mathbb{P}_5/\mathbb{P}_6$ (new)	50	2.46E−13	—	4.75E−13	—	1.79E−13	—	3.42E−13	—
	100	2.47E−12	↑	4.67E−12	↑	2.24E−12	↑	4.56E−12	↑
	150	4.09E−13	4.44	8.24E−13	4.28	9.28E−12	↑	1.83E−11	↑
	200	6.53E−12	↑	1.52E−11	↑	3.62E−11	↑	6.77E−11	↑