

Regions	(a,b)=(0,1) (c,d)=($\frac{1}{1000}$,1)	(a,b)=(0,1) (c,d)=($\frac{1}{1000}$,1)	(a,b)=(1,2) (c,d)=(3,4)	(a,b)=(0,15) (c,d)=($\frac{1}{8}$,15)	(a,b)=(0,15) (c,d)=(15,20)
(MAXTERMS, MAXDEGREE)	(20, 20)	(10, 10)	(7, 7)	(15,15)	(20,15)
Number of Subregions	1	22	5	44	23
Approximation Generation Time (s)	18.137	95.069	16.609	676.246	445.755
$\ f\ _\infty$	1.00	1.00	0.50	1.00	0.28
Max Error ($\ f - approx\ _\infty / \max(\ f\ _\infty, 1)$)	3.79e-15	4.19e-15	3.54e-15	4.35e-15	3.06e-15
Original Maple Time (s)	1.612	1.625	1.620	1.952	1.976
evalf Time (s)	30.438	13.916	8.876	26.894	22.690
evalhf Time (s)	3.064	1.276	0.840	2.280	1.996
Compiled Time (s)	0.244	0.132	0.104	0.188	0.180
Speedup Factor (origMaple/evalf)	-	-	-	-	-
Speedup Factor (evalf/evalhf)	9.935	10.91	10.57	11.79	11.37
Speedup Factor (evalhf/compiled)	12.56	9.667	8.077	12.13	11.09
Overall Speedup (origMaple/compiled)	6.607	12.31	15.58	10.38	10.98
Original Maple Plot Time (s)	0.216	0.232	0.228	0.232	0.256
Approximation Plot Time (s)	0.040	0.028	0.024	0.036	0.032
Plot Speedup Factor	5.400	8.286	9.500	6.444	8.000

Table 7.1: Timings and Errors for Approximating $J_x(y)$ Using Rational Approximation

Regions	(a,b)=(0,1) (c,d)=($\frac{1}{1000}$,1)	(a,b)=(1,10) (c,d)=(1,10)	(a,b)=(1,10) (c,d)=(1,10)	(a,b)=(0,15) (c,d)=($\frac{1}{8}$,15)	(a,b)=(0,15) (c,d)=(15,25)
(MAXTERMS, MAXDEGREE)	(10, 20)	(15, 15)	(20, 30)	(15,25)	(15,25)
Number of Subregions	22	48	4	39	22
Approximation Generation Time (s)	74.708	260.492	65.348	465.885	281.317
$\ f\ _\infty$	1.00	0.58	0.58	1.00	0.28
Max Error ($\ f - approx\ _\infty / \max(\ f\ _\infty, 1)$)	4.18e-15	3.92e-15	2.57e-15	4.56e-15	4.76e-15
Original Maple Time (s)	1.708	1.780	1.908	1.892	2.120
evalf Time (s)	13.957	17.737	38.966	25.109	27.358
evalhf Time (s)	1.160	1.176	3.084	1.840	2.012
Compiled Time (s)	0.128	0.124	0.252	0.176	0.180
Speedup Factor (origMaple/evalf)	-	-	-	-	-
Speedup Factor (evalf/evalhf)	12.03	15.09	12.64	13.65	13.60
Speedup Factor (evalhf/compiled)	9.062	9.484	12.24	10.45	11.18
Overall Speedup (origMaple/compiled)	13.34	14.35	7.571	10.75	11.78
Original Maple Plot Time (s)	0.216	0.216	0.252	0.264	0.292
Approximation Plot Time (s)	0.028	0.028	0.048	0.036	0.036
Plot Speedup Factor	7.714	7.714	5.250	7.333	8.111

Table 7.2: Timings and Errors for Approximating $J_x(y)$ Using Polynomial Approximation