

Table 25.10 ABSCESSAS AND WEIGHT FACTORS FOR HERMITE INTEGRATION

$$\int_{-\infty}^{\infty} e^{-x^2} f(x) dx \approx \sum_{i=1}^n w_i f(x_i)$$

$$\int_{-\infty}^{\infty} g(x) dx \approx \sum_{i=1}^n w_i e^{x_i^2} g(x_i)$$

Abscissas = $\pm x_i$ (Zeros of Hermite Polynomials)

Weight Factors = w_i

$\pm x_i$	w_i	$w_i e^{x_i^2}$	$\pm x_i$	w_i	$w_i e^{x_i^2}$
n=2			n=10		
0.70710 67811 86548	(-1)8.86226 92545 28	1.46114 11826 611	0.34290 13272 23705	(-1)6.10862 63373 53	0.68708 18539 513
n=3			n=12		
0.00000 00000 00000	(0)1.18163 59006 04	1.18163 59006 037	1.03661 08297 89514	(-1)2.60492 31026 42	0.70329 63231 049
1.22474 48713 91589	(-1)2.95408 97515 09	1.32393 11752 136	1.75668 36492 99882	(-2)3.38743 94455 48	0.74144 19319 436
n=4			n=16		
0.52464 76232 75290	(-1)8.04914 09000 55	1.05996 44828 950	0.31424 03762 54359	(-1)5.70135 23626 25	0.62930 78743 695
1.65068 01238 85785	(-2)8.13128 35447 25	1.24022 58176 958	0.94778 83912 40164	(-1)2.60492 31026 42	0.63962 12320 203
n=5			n=20		
0.00000 00000 00000	(-1)9.45308 72048 29	0.94530 87204 829	1.59768 26351 52605	(-2)5.16079 85615 88	0.66266 27732 669
0.95857 24646 13819	(-1)3.93619 32315 22	0.98658 09967 514	2.27950 70805 01060	(-3)3.90539 05846 29	0.70522 03661 122
2.02018 28704 56086	(-2)1.99532 42059 05	1.18148 86255 360	3.02063 70251 20890	(-5)8.57368 70435 88	0.78664 39394 633
n=6			n=24		
0.43607 74119 27617	(-1)7.24629 59522 44	0.87640 13344 362	3.88972 48978 69782	(-7)2.65855 16843 56	0.98969 90470 923
1.33584 90740 13697	(-1)1.57067 32032 29	0.93558 05576 312	n=16		
2.35060 49736 74492	(-3)4.53000 99055 09	1.13690 83326 745	0.27348 10461 3815	(-1)5.07929 47901 66	0.54737 52050 378
n=7			n=28		
0.00000 00000 00000	(-1)8.10264 61755 68	0.81026 46175 568	0.82295 14491 4466	(-1)2.80647 45852 85	0.55244 19573 675
0.81628 78828 58965	(-1)4.25607 25261 01	0.82868 73032 836	1.38025 85391 9888	(-2)8.38100 41398 99	0.56321 78290 882
1.67355 16287 67471	(-2)5.45155 82819 13	0.89718 46002 252	1.95178 79909 1625	(-2)1.28803 11535 51	0.58124 72754 009
2.65196 13568 35233	(-4)9.71781 24509 95	1.10133 07296 103	2.54620 21578 4748	(-4)9.32284 00862 42	0.60973 69582 560
n=8			n=32		
0.38118 69902 07322	(-1)6.61147 01255 82	0.76454 41286 517	3.17699 91619 7996	(-5)2.71186 00925 38	0.65575 56728 761
1.15719 37124 46780	(-1)2.07802 32581 49	0.79289 00483 864	3.86944 79048 6012	(-7)2.32098 08448 65	0.73824 56222 777
1.98165 67566 95843	(-2)1.70779 83007 41	0.86675 26065 634	4.68873 89393 0582	(-10)2.65480 74740 11	0.93687 44928 841
2.93063 74202 57244	(-4)1.99604 07221 14	1.07193 01442 480	n=20		
n=9			n=40		
0.00000 00000 00000	(-1)7.20235 21560 61	0.72023 52156 061	0.24534 07083 009	(-1)4.62243 66960 06	0.49092 15006 667
0.72355 10187 52838	(-1)4.32651 55900 26	0.73030 24527 451	0.73747 37285 454	(-1)2.86675 50536 28	0.49384 33852 721
1.46855 32892 16668	(-2)8.84745 27394 38	0.76460 81250 946	1.23407 62153 953	(-1)1.09017 20602 00	0.49992 08713 363
2.26658 05845 31843	(-3)4.94362 42755 37	0.84175 27014 787	1.73853 77121 166	(-2)2.48105 20887 46	0.50967 90271 175
3.19099 32017 81528	(-5)3.96069 77263 26	1.04700 35809 767	2.25497 40020 893	(-3)3.24377 33422 38	0.52408 03509 486
n=10			n=48		
0.00000 00000 00000	(-1)7.20235 21560 61	0.72023 52156 061	2.78880 60584 281	(-4)2.28338 63601 63	0.54485 17423 644
0.72355 10187 52838	(-1)4.32651 55900 26	0.73030 24527 451	3.34785 45673 832	(-6)7.80255 64785 32	0.57526 24428 525
1.46855 32892 16668	(-2)8.84745 27394 38	0.76460 81250 946	3.94476 40401 156	(-7)1.08606 93707 69	0.62227 86961 914
2.26658 05845 31843	(-3)4.94362 42755 37	0.84175 27014 787	4.60368 24495 507	(-10)4.39934 09922 73	0.70433 29611 769
3.19099 32017 81528	(-5)3.96069 77263 26	1.04700 35809 767	5.38748 08900 112	(-13)2.22939 36455 34	0.89859 19614 532

Compiled from H. E. Salzer, R. Zucker, and R. Capuano, Table of the zeros and weight factors of the first twenty Hermite polynomials, J. Research NBS 48, 111-116, 1952, RP2294 (with permission).

Table 25.11 COEFFICIENTS FOR FILON'S QUADRATURE FORMULA

θ	α	β	γ
0.00	0.00000 000	0.66666 667	1.33333 333
0.01	0.00000 004	0.66668 000	1.33332 000
0.02	0.00000 036	0.66671 999	1.33328 000
0.03	0.00000 120	0.66678 664	1.33321 334
0.04	0.00000 284	0.66687 990	1.33312 001
0.05	0.00000 555	0.66699 976	1.33300 003
0.06	0.00000 961	0.66714 617	1.33285 340
0.07	0.00001 524	0.66731 909	1.33268 012
0.08	0.00002 274	0.66751 844	1.33248 020
0.09	0.00003 237	0.66774 417	1.33225 365
0.1	0.00004 438	0.66799 619	1.33200 048
0.2	0.00035 354	0.67193 927	1.32800 761
0.3	0.00118 467	0.67836 065	1.32137 184
0.4	0.00278 012	0.68703 909	1.31212 154
0.5	0.00536 042	0.69767 347	1.30029 624
0.6	0.00911 797	0.70989 111	1.28594 638
0.7	0.01421 151	0.72325 813	1.26913 302
0.8	0.02076 156	0.73729 136	1.24992 752
0.9	0.02884 683	0.75147 168	1.22841 118
1.0	0.03850 188	0.76525 831	1.20467 472

See 25.4.47.