

Table 7.7

FRESNEL INTEGRALS

$$C(x) = \int_0^x \cos\left(\frac{\pi}{2}t^2\right) dt \quad S(x) = \int_0^x \sin\left(\frac{\pi}{2}t^2\right) dt$$

$x$	$C(x)$	$S(x)$	$x$	$C(x)$	$S(x)$	$x$	$C(x)$	$S(x)$
2.00	0.48825 34	0.34341 57	3.00	0.60572 08	0.49631 30	4.00	0.49842 60	0.42051 58
2.02	0.50820 04	0.34467 48	3.02	0.60383 73	0.51619 42	4.02	0.51821 54	0.42301 99
2.04	0.52782 73	0.34844 87	3.04	0.59823 78	0.53536 29	4.04	0.53675 05	0.43039 00
2.06	0.54681 06	0.35470 04	3.06	0.58910 11	0.55311 95	4.06	0.55284 04	0.44217 81
2.08	0.56482 79	0.36334 98	3.08	0.57674 01	0.56880 28	4.08	0.56543 47	0.45764 45
2.10	0.58156 41	0.37427 34	3.10	0.56159 39	0.58181 59	4.10	0.57369 56	0.47579 83
2.12	0.59671 75	0.38730 37	3.12	0.54421 58	0.59165 11	4.12	0.57705 88	0.49545 71
2.14	0.61000 60	0.40223 09	3.14	0.52525 53	0.59791 29	4.14	0.57527 76	0.51532 14
2.16	0.62117 32	0.41880 45	3.16	0.50543 56	0.60033 66	4.16	0.56844 74	0.53405 87
2.18	0.62999 53	0.43673 63	3.18	0.48552 76	0.59880 34	4.18	0.55700 75	0.55039 41
2.20	0.63628 60	0.45570 46	3.20	0.46632 03	0.59334 95	4.20	0.54171 92	0.56319 89
2.22	0.63990 31	0.47535 85	3.22	0.44858 96	0.58416 97	4.22	0.52362 06	0.57157 23
2.24	0.64075 25	0.49532 41	3.24	0.43306 55	0.57161 47	4.24	0.50396 08	0.57491 03
2.26	0.63879 28	0.51521 11	3.26	0.42040 05	0.55618 06	4.26	0.48411 63	0.57295 47
2.28	0.63403 83	0.53462 03	3.28	0.41113 97	0.53849 35	4.28	0.46549 61	0.56582 05
2.30	0.62656 17	0.55315 16	3.30	0.40569 44	0.51928 61	4.30	0.44944 12	0.55399 59
2.32	0.61649 45	0.57041 28	3.32	0.40431 99	0.49936 95	4.32	0.43712 50	0.53831 55
2.34	0.60402 69	0.58602 84	3.34	0.40709 96	0.47960 04	4.34	0.42946 40	0.51990 77
2.36	0.58940 65	0.59964 89	3.36	0.41393 66	0.46084 46	4.36	0.42704 39	0.50011 73
2.38	0.57293 44	0.61095 96	3.38	0.42455 18	0.44393 82	4.38	0.43006 79	0.48041 08
2.40	0.55496 14	0.61969 00	3.40	0.43849 17	0.42964 95	4.40	0.43833 29	0.46226 80
2.42	0.53588 11	0.62562 11	3.42	0.45514 37	0.41864 11	4.42	0.45123 59	0.44707 06
2.44	0.51612 29	0.62859 38	3.44	0.47375 96	0.41143 69	4.44	0.46781 05	0.43599 33
2.46	0.49614 28	0.62851 43	3.46	0.49348 70	0.40839 28	4.46	0.48679 41	0.42990 86
2.48	0.47641 35	0.62535 98	3.48	0.51340 62	0.40967 54	4.48	0.50671 95	0.42931 16
2.50	0.45741 30	0.61918 18	3.50	0.53257 24	0.41524 80	4.50	0.52602 59	0.43427 30
2.52	0.43961 32	0.61010 76	3.52	0.55006 11	0.42486 72	4.52	0.54318 11	0.44442 34
2.54	0.42346 72	0.59834 06	3.54	0.56501 32	0.43808 83	4.54	0.55680 46	0.45897 36
2.56	0.40939 65	0.58415 75	3.56	0.57668 02	0.45428 17	4.56	0.56578 27	0.47676 89
2.58	0.39777 91	0.56790 42	3.58	0.58446 43	0.47265 92	4.58	0.56936 57	0.49637 56
2.60	0.38893 75	0.54998 93	3.60	0.58795 33	0.49230 95	4.60	0.56723 67	0.51619 23
2.62	0.38312 73	0.53087 53	3.62	0.58694 64	0.51224 12	4.62	0.55954 81	0.53457 97
2.64	0.38052 80	0.51106 79	3.64	0.58147 10	0.53143 21	4.64	0.54691 86	0.54999 67
2.66	0.38123 50	0.49110 35	3.66	0.57178 75	0.54888 15	4.66	0.53039 13	0.56113 28
2.68	0.38525 32	0.47153 52	3.68	0.55838 18	0.56366 38	4.68	0.51135 38	0.56702 44
2.70	0.39249 40	0.45291 75	3.70	0.54194 57	0.57498 04	4.70	0.49142 65	0.56714 55
2.72	0.40277 39	0.43578 98	3.72	0.52334 49	0.58220 56	4.72	0.47232 71	0.56146 19
2.74	0.41581 68	0.42066 03	3.74	0.50357 70	0.58492 61	4.74	0.45572 30	0.55044 52
2.76	0.43125 85	0.40798 90	3.76	0.48371 94	0.58296 92	4.76	0.44308 30	0.53504 16
2.78	0.44865 46	0.39817 24	3.78	0.46487 19	0.57641 91	4.78	0.43554 28	0.51659 82
2.80	0.46749 17	0.39152 84	3.80	0.44809 49	0.56561 87	4.80	0.43379 66	0.49675 02
2.82	0.48720 04	0.38828 41	3.82	0.43434 86	0.55115 74	4.82	0.43802 47	0.47728 00
2.84	0.50717 21	0.38856 43	3.84	0.42443 43	0.53384 32	4.84	0.44786 69	0.45995 75
2.86	0.52677 66	0.39238 50	3.86	0.41894 43	0.51466 22	4.86	0.46244 40	0.44637 74
2.88	0.54538 21	0.39964 80	3.88	0.41822 16	0.49472 45	4.88	0.48042 90	0.43780 82
2.90	0.56237 64	0.41014 06	3.90	0.42233 27	0.47520 24	4.90	0.50016 10	0.43506 74
2.92	0.57718 78	0.42353 87	3.92	0.43105 68	0.45726 13	4.92	0.51979 51	0.43843 48
2.94	0.58930 60	0.43941 39	3.94	0.44389 17	0.44198 92	4.94	0.53747 34	0.44761 56
2.96	0.59830 19	0.45724 45	3.96	0.46007 70	0.43032 79	4.96	0.55150 25	0.46175 67
2.98	0.60384 56	0.47643 06	3.98	0.47863 51	0.42301 17	4.98	0.56051 94	0.47951 78

3.00	0.60572 08	0.49631 30	4.00	0.49842 60	0.42051 58	5.00	0.56363 12	0.49919 14
	$\left[ \begin{smallmatrix} (-4)5 \\ 6 \end{smallmatrix} \right]$	$\left[ \begin{smallmatrix} (-4)4 \\ 6 \end{smallmatrix} \right]$		$\left[ \begin{smallmatrix} (-4)6 \\ 7 \end{smallmatrix} \right]$	$\left[ \begin{smallmatrix} (-4)6 \\ 7 \end{smallmatrix} \right]$		$\left[ \begin{smallmatrix} (-4)7 \\ 7 \end{smallmatrix} \right]$	$\left[ \begin{smallmatrix} (-4)8 \\ 7 \end{smallmatrix} \right]$

For  $x > 5$   $\frac{C(x)}{S(x)} = 0.5 \pm \left( 0.3183099 - \frac{0.0968}{x^4} \right) \frac{\sin\left(\frac{\pi}{2}x^2\right)}{x} - \left( 0.10132 - \frac{0.154}{x^4} \right) \frac{\cos\left(\frac{\pi}{2}x^2\right)}{x^3} + \epsilon(x) \quad |\epsilon(x)| < 3 \times 10^{-7}$

For  $u > 39$   $\frac{C_2(u)}{S_2(u)} = 0.5 \pm \left( 0.3989423 - \frac{0.3}{u^2} \right) \frac{\sin(u)}{\sqrt{u}} - \left( 0.19947 - \frac{0.748}{u^2} \right) \frac{\cos(u)}{u\sqrt{u}} + \epsilon(u) \quad |\epsilon(u)| < 3 \times 10^{-7}$