# POLYTECHNIC INSTITUTE OF BROOKLYN

333 Jay Street, Brooklyn 1, New York

PHYSICS DEPARTMENT

## FREE ELECTRON MODEL CALCULATION OF THE DEPENDENCE OF THE ATTENUATION OF TRANSVERSE SOUND WAVES ON A MAGNETIC FIELD PARALLEL TO THE LATTICE DISPLACEMENT

by

Harold L. Grubin

RESEARCH REPORT

GRANT AF-AFOSR 62-258

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RESEARCH ASSISTANT Harold L. Grubin

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## I. ABSTRACT

The results of a calculation of the attenuation of ultrasonic waves in a metal when a d.c. magnetic field is present in a direction parallel to the polarization direction of a sound wave is described. A principal part of the report includes tables of use to anyone interested in attenuation calculations. Graphical results for the case in question are included.

## II. INTRODUCTION AND DISCUSSION

This note* reports the results of a calculation of the attenuation of ultrasonic waves in a metal when a d.c. magnetic field $\underline{H}$ is present in a direction parallel to the polarization direction $\underline{U}$ of a transverse sound wave. The method of treatment involves the simultaneous solution of Maxwell's equations with the Boltzmann transport equation, applied to a free electron model. Thus, the formulation of the problem is the same as that of Cohen, Harrison and Harrison[1] who in their general discussion of the problem include an evaluation of the attenuation for an infinite electronic mean free path. Indeed the analytical results obtained are identical with those of CHH, however, we solved the linearized Boltzmann equation by standard techniques of partial differential equations rather than by Chambers method as employed by CHH; furthermore, the attenuation has been evaluated for a set of different values of the electronic mean free path.

The results shown in Fig. 1 may be regarded as the attenuation $Re(\alpha)$ plotted against $1/H$, for a series of different values of the electronic mean free path $l$ (corresponding to different $ql$[2] ). The abscissa is the dimension-

*Based on a thesis submitted in partial fullfillment of the requirements for the degree of Master of Science (Physics) at the Polytechnic Institute of Brooklyn.

less variable $X_F = q\, v_F/\omega_c$ where $\omega_c$ is the cyclotron frequency eH/mc. The results shown in Fig. 1, however, are not in agreement with experimental findings[3] in particular the presence of a substantial peak in the magneto-acoustic oscillations observed experimentally is not discernible in the free electron model result.

Each curve represents a monotonically increasing function, approaching a limit at zero magnetic field (large $X_F$), identical with the zero field limit indicated by Pippard[4]. For curves corresponding to larger electronic mean free paths we observe the presence of slight "wiggles" that have the appearance of oscillations about curves having simpler forms. This is most apparent when we consider the curve for infinite mean free path, here we appear to have oscillations about a curve of constant slope. We note that the curve for infinite electronic free path is the same as that of CHH. The oscillations are a consequence of the presence of Bessel functions in the expression of the magneto-acoustic conductivity (see below).

The theory requires the calculation, from the Boltzmann equation, of the magneto-acoustic conductivity. The specific expression turns out to be:

$$\sigma = 3\sigma_o \sum_{n=-\infty}^{+\infty} \frac{r_n(X_F)}{1+i\tau(n\omega_c-\omega)} \qquad (1)$$

where $\sigma_o$ is the d.c. conductivity $\frac{N_o e^2 \tau}{m}$, $N_o$ the electron density at absolute zero and:

$$r_n(X_F) = \int_o^{\pi/2} d\theta\, J_n^{\,2}(X_F \sin\theta) \cos^2\theta \sin\theta \qquad (2)$$

$J_n$ being a Bessel function of the first kind[5]. Equation (1) is the same as Eq. (4.1) of CHH. The attenuation coefficient Re(α) is then:

$$\mathrm{Re}(\alpha) = \frac{m}{Mc_s \tau} \mathrm{Re}\left[\frac{1}{\sigma/\sigma_o} - 1\right] \qquad (3)$$

Some comparison may be made between the curves presented in here and those reported by Kjeldaas and Holstein[6] for the case of a magnetic field perpendicular to the direction of polarization of a transverse sound wave. We observe:

a) the corresponding expression for the zero field limits are the same,

b) ~~maxima in the attenuation curves of Kjeldaas and Holstein correspond to valleys in the~~ curves shown here.

It should be noted that the distance between valleys is very nearly equal to π. There is a problem in defining points of maxima and minima in the curves presented, since the curves are monotonically increasing; however, one can isolate certain sections of the curves and observe maxima and minima in these sections.

We tabulate in the appendices the computations required to obtain the curves shown in Fig. 1. Table I contains the actual plotted points.

III

FIGURE I

MAGNETIC FIELD DEPENDENCE OF THE ATTENUATION.

ORDINATE: $Re\,[\alpha(X_F)]/\frac{m}{\hbar q\tau}$

ABSCISSA: $X_F$

(All curves were obtained by computation at the points indicated on the curve for $ql=3$.)

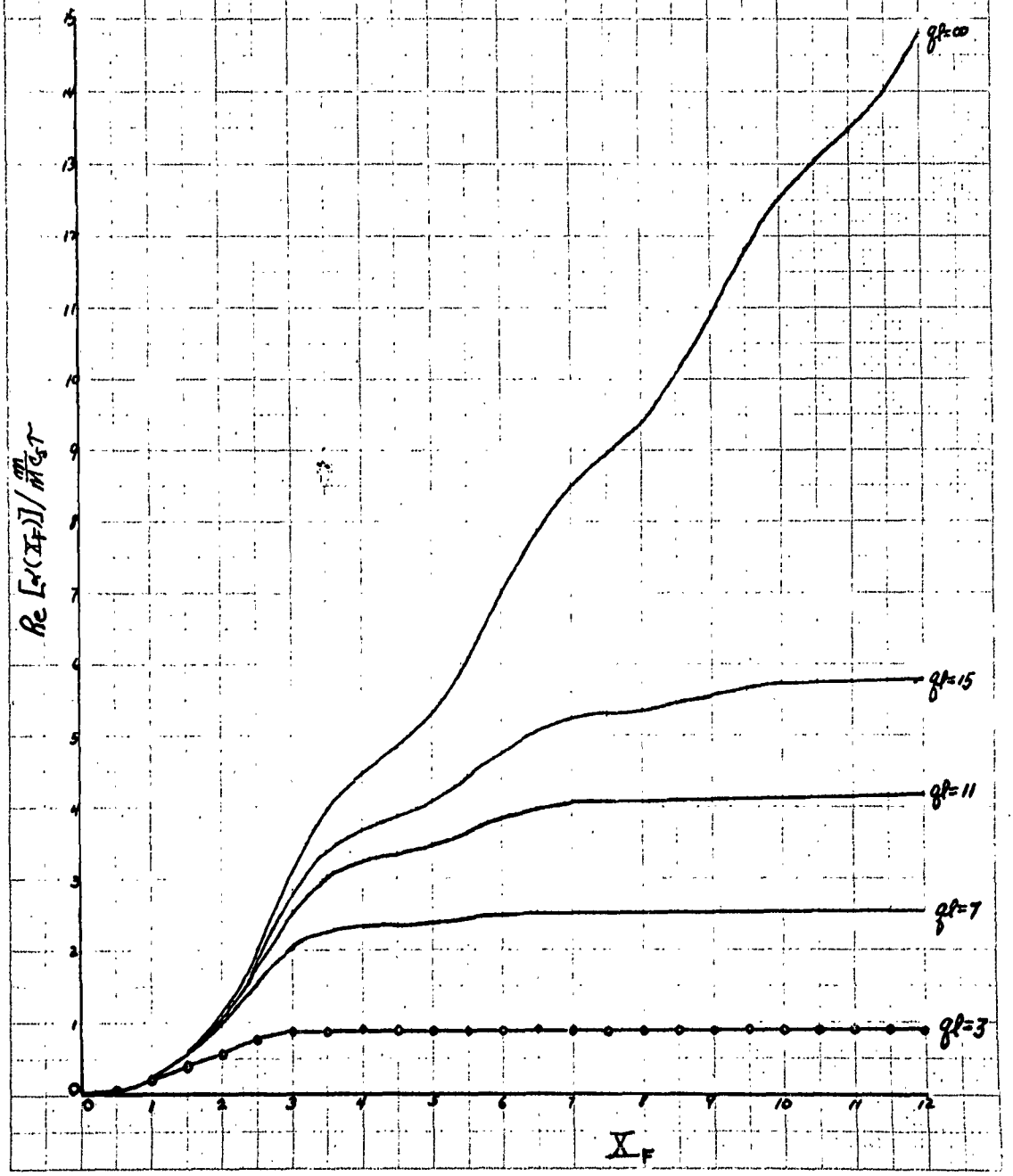

TABLE I



| $X_p$ | $\sigma/3\sigma_0$ $(qf=3)$ | $Re\, a(X_p)/\frac{m}{mc_5\tau}$ $(qf=3)$ |
|---|---|---|
| 0.0 | 0. 333 333 333 | 0. 000 000 000 |
| 0.5 | 0. 317 541 907 | 0. 049 730 211 |
| 1.0 | 0. 279 221 421 | 0. 193 795 705 |
| 1.5 | 0. 237 185 981 | 0. 405 366 927 |
| 2.0 | 0. 209 673 585 | 0. 589 772 661 |
| 2.5 | 0. 187 671 230 | 0. 776 155 744 |
| 3.0 | 0. 180 149 269 | 0. 850 317 435 |
| 3.5 | 0. 177 923 677 | 0. 873 462 480 |
| 4.0 | 0. 177 520 664 | 0. 877 715 674 |
| 4.5 | 0. 177 389 950 | 0. 879 099 313 |
| 5.0 | 0. 177 165 011 | 0. 881 485 127 |
| 5.5 | 0. 176 894 144 | 0. 884 366 128 |
| 6.0 | 0. 176 667 383 | 0. 886 784 802 |
| 6.5 | 0. 176 507 776 | 0. 888 490 925 |
| 7.0 | 0. 176 401 137 | 0. 889 632 567 |
| 7.5 | 0. 176 322 914 | 0. 890 470 873 |
| 8.0 | 0. 176 134 072 | 0. 892 497 740 |
| 8.5 | 0. 176 197 214 | 0. 891 819 545 |
| 9.0 | 0. 176 148 015 | 0. 892 347 940 |
| 9.5 | 0. 176 107 778 | 0. 892 780 302 |
| 10.0 | 0. 176 071 130 | 0. 893 174 271 |
| 10.5 | 0. 176 041 090 | 0. 893 497 326 |
| 11.0 | 0. 176 015 163 | 0. 893 776 238 |
| 11.5 | 0. 175 992 466 | 0. 894 020 470 |
| 12.0 | 0. 175 972 554 | 0. 894 234 786 |

TABLE I (Con't.)

| $X_F$ | $\sigma/3\sigma_0$ $(ql=7)$ | $Re\,d(X_F)/\frac{dM}{MCS\gamma}$ $(ql=7)$ |
|---|---|---|
| 0.0 | 0. 333 333 333 | 0. 000 000 000 |
| 0.5 | 0. 317 188 085 | 0. 050 901 181 |
| 1.0 | 0. 274 552 107 | 0. 214 098 616 |
| 1.5 | 0. 219 772 661 | 0. 516 718 830 |
| 2.0 | 0. 169 437 629 | 0. 967 292 243 |
| 2.5 | 0. 131 453 708 | 1. 535 746 905 |
| 3.0 | 0. 110 651 377 | 2. 012 464 393 |
| 3.5 | 0. 102 256 455 | 2. 259 777 911 |
| 4.0 | 0. 100 165 116 | 2. 327 838 539 |
| 4.5 | 0. 099 621 188 | 2. 346 008 414 |
| 5.0 | 0. 098 553 645 | 2. 382 252 714 |
| 5.5 | 0. 096 957 568 | 2. 437 930 016 |
| 6.0 | 0. 095 548 073 | 2. 488 645 274 |
| 6.5 | 0. 094 771 374 | 2. 517 236 474 |
| 7.0 | 0. 094 560 001 | 2. 525 098 665 |
| 7.5 | 0. 094 583 148 | 2. 524 235 980 |
| 8.0 | 0. 094 572 218 | 2. 524 643 287 |
| 8.5 | 0. 094 455 250 | 2. 529 008 001 |
| 9.0 | 0. 094 298 881 | 2. 534 859 902 |
| 9.5 | 0. 094 186 736 | 2. 539 068 742 |
| 10.0 | 0. 094 143 134 | 2. 540 707 847 |
| 10.5 | 0. 094 142 624 | 2. 540 727 028 |
| 11.0 | 0. 094 144 997 | 2. 540 637 781 |
| 11.5 | 0. 094 139 938 | 2. 540 828 052 |
| 12.0 | 0. 094 104 214 | 2. 542 172 227 |

TABLE I (Con't.)

| $X_F$ | $\sigma/3\sigma_0$ (qf=11) | $Re\,d(I_F)/\frac{m}{MC_{ST}}$ (qf=11) |
|---|---|---|
| 0.0 | 0. 333 333 333 | 0. 000 000 000 |
| 0.5 | 0. 317 139 501 | 0. 051 062 173 |
| 1.0 | 0. 273 863 673 | 0. 217 150 597 |
| 1.5 | 0. 216 922 001 | 0. 536 650 647 |
| 2.0 | 0. 162 118 525 | 1. 056 108 845 |
| 2.5 | 0. 119 679 190 | 1. 785 223 841 |
| 3.0 | 0. 094 375 415 | 2. 531 993 298 |
| 3.5 | 0. 082 880 323 | 3. 021 863 347 |
| 4.0 | 0. 079 028 110 | 3. 217 908 454 |
| 4.5 | 0. 077 299 968 | 3. 312 205 321 |
| 5.0 | 0. 074 921 859 | 3. 449 079 851 |
| 5.5 | 0. 071 747 564 | 3. 645 918 477 |
| 6.0 | 0. 068 826 911 | 3. 843 066 883 |
| 6.5 | 0. 066 982 152 | 3. 976 450 044 |
| 7.0 | 0. 066 423 231 | 4. 018 324 587 |
| 7.5 | 0. 065 998 620 | 4. 050 610 654 |
| 8.0 | 0. 065 758 084 | 4. 069 085 244 |
| 8.5 | 0. 065 305 466 | 4. 104 217 973 |
| 9.0 | 0. 064 772 229 | 4. 146 238 418 |
| 9.5 | 0. 064 372 348 | 4. 178 206 849 |
| 10.0 | 0. 064 193 292 | 4. 192 650 555 |
| 10.5 | 0. 064 165 300 | 4. 194 915 839 |
| 11.0 | 0. 064 158 535 | 4. 195 463 601 |
| 11.5 | 0. 064 095 852 | 4. 200 544 542 |
| 12.0 | 0. 063 987 166 | 4. 209 377 976 |

TABLE I (Con't.)

| $X_F$ | $\sigma/3\sigma_0$ $(qf=15)$ | $Re\,\alpha(X_F)/\frac{m}{\rho C_{ST}}$ $(qf=15)$ |
|---|---|---|
| 0.0 | 0. 333 333 333 | 0. 000 000 000 |
| 0.5 | 0. 317 124 157 | 0. 051 113 029 |
| 1.0 | 0. 273 643 699 | 0. 218 129 028 |
| 1.5 | 0. 215 993 923 | 0. 543 253 294 |
| 2.0 | 0. 159 683 391 | 1. 087 464 020 |
| 2.5 | 0. 115 636 152 | 1. 882 604 656 |
| 3.0 | 0. 085 031 928 | 2. 761 691 218 |
| 3.5 | 0. 075 809 091 | 3. 397 010 027 |
| 4.0 | 0. 071 093 400 | 3. 688 667 771 |
| 4.5 | 0. 068 693 242 | 3. 852 490 923 |
| 5.0 | 0. 065 552 423 | 4. 034 988 747 |
| 5.5 | 0. 061 446 732 | 4. 424 752 830 |
| 6.0 | 0. 057 573 415 | 4. 789 709 249 |
| 6.5 | 0. 054 960 948 | 5. 064 912 368 |
| 7.0 | 0. 053 699 109 | 5. 207 427 637 |
| 7.5 | 0. 053 143 692 | 5. 272 302 897 |
| 8.0 | 0. 052 585 968 | 5. 338 826 611 |
| 8.5 | 0. 051 757 406 | 5. 440 302 153 |
| 9.0 | 0. 050 811 755 | 5. 560 161 784 |
| 9.5 | 0. 050 063 842 | 5. 658 165 254 |
| 10.0 | 0. 049 661 174 | 5. 712 151 696 |
| 10.5 | 0. 049 510 542 | 5. 732 572 899 |
| 11.0 | 0. 049 409 025 | 5. 746 405 810 |
| 11.5 | 0. 049 223 404 | 5. 771 846 443 |
| 12.0 | 0. 048 963 504 | 5. 807 791 642 |

TABLE I (Con't.)

| $X_F$ | $\sigma/3\sigma_0$ $(\ell=\infty)$ | $Re(X_F)/\frac{m}{MC_{ST}}$ $(\ell=\infty)$ |
|---|---|---|
| 0.0 | 0. 333 333 333 | 0. 000 000 000 |
| 0.5 | 0. 317 106 269 | 0. 051 172 322 |
| 1.0 | 0. 273 385 667 | 0. 219 278 746 |
| 1.5 | 0. 214 894 401 | 0. 551 149 456 |
| 2.0 | 0. 156 763 851 | 1. 126 340 551 |
| 2.5 | 0. 110 702 286 | 2. 011 079 042 |
| 3.0 | 0. 081 451 231 | 3. 092 428 429 |
| 3.5 | 0. 066 852 651 | 3. 986 089 980 |
| 4.0 | 0. 060 848 254 | 4. 478 108 432 |
| 4.5 | 0. 057 358 432 | 4. 811 409 442 |
| 5.0 | 0. 052 940 111 | 5. 296 423 015 |
| 5.5 | 0. 047 231 244 | 6. 057 475 202 |
| 6.0 | 0. 041 623 793 | 7. 008 240 222 |
| 6.5 | 0. 037 470 534 | 7. 895 878 914 |
| 7.0 | 0. 035 028 603 | 8. 516 032 749 |
| 7.5 | 0. 033 545 414 | 8. 936 778 044 |
| 8.0 | 0. 032 053 108 | 9. 399 407 549 |
| 8.5 | 0. 030 099 110 | 10. 074 524 573 |
| 9.0 | 0. 027 904 243 | 10. 945 614 626 |
| 9.5 | 0. 025 983 416 | 11. 828 695 554 |
| 10.0 | 0. 024 646 010 | 12. 524 839 652 |
| 10.5 | 0. 023 780 906 | 13. 016 847 521 |
| 11.0 | 0. 023 023 101 | 13. 478 211 833 |
| 11.5 | 0. 022 086 660 | 14. 092 066 131 |
| 12.0 | 0. 020 966 886 | 14. 898 084 881 |

V

# APPENDIX A

## DESCRIPTION OF CALCULATIONS

The function $r_n(X_F)$ appearing Eq. (1) is evaluated from

$$r_n(X_F) = \left(\frac{1}{2} + \frac{1-4n^2}{8X_F}\right) g_n(X_F) - \frac{1}{8X_F^2} J_{2n}(2X_F) + \frac{1}{8X_F}\left(J_{2n-1}(2X_F) - J_{2n+1}(2X_F)\right) \quad (A\text{-}1)$$

where

$$g_n(X_F) = X_F^{-1} \sum_{m=o}^{\infty} J_{2m+2n+1}(2X_F) \quad (A\text{-}2)$$

Equation (A-1) is essentially identical to Eq. (A1) of CHH.

Col. (I) of the tabulated calculations contains the values of $X_F g_n(X_F)$ for $X_F = 0, \frac{1}{2}, 1, \frac{3}{2} \ldots 12$. The first term of Eq. (A-1) is then obtained by multiplying the values $\left(\frac{1}{2} + \frac{1-4n^2}{8X_F}\right)\frac{1}{X_F}$, (Col. (II)), by the corresponding terms of Col. (I), the results are tabulated in Col. (III). Cols. (IV) and (V) contain the terms $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ and $\frac{1}{8X_F}\left(J_{2n-1}(2X_F) - J_{2n+1}(2X_F)\right)$ respectively. Summing Cols. (III), (IV) and (V) we obtain $r_n(X_F)$, tabulated in Col. (VI).

To obtain the attenuation we must calculate the ratio $r_n(X_F)/1+(ql)^2 \frac{n^2}{X_F^2}$ for ql = 3, 7, 11, 15 ; values of this ratio are contained in Cols. (VIII), (X), (XII) and (XIV), with the values $1+(ql)^2 n^2/X_F^2$ tabulated in Cols. (VII),

(IX), (XI) and (XIII). It should be noted that the above ratio for $ql=\infty$ is non-zero only for n=o.

The ratio of $\sigma/3\sigma_0$ (see Eq. (1)) consists in performing a summation of the Cols. (VIII), (X), (XII) and (XIV). These results are tabulated in Table I. A calculation of the relative attenuation $\mathrm{Re}\left[\alpha(X_F)\right] / \frac{m}{mc_s\tau}$ is obtained by subtracting one (1) from the reciprocal of $\sigma/3\sigma_0$; this is also tabulated in Table I.

Computations were performed retaining nine places; one can expect the attenuation to have five significant figures when its numerical value is of the order of magnitude of a tenth, and less than five significant figures when the order of magnitude is less than a tenth.

Bessel functions in a form most suitable for the numerical evaluation of the above equations were found in Ref. (5).

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 0.5 | 0 | 0. 459 865 202 | 2 | + 0. 919 730 404 |
| | 1 | 0. 019 814 617 | - 2 | - 0. 039 629 234 |
| | 2 | 0. 000 251 264 | - 14 | - 0. 003 517 696 |
| | 3 | 0. 000 001 507 | - 34 | - 0. 000 051 238 |
| | 4 | 0. 000 000 005 | - 62 | - 0. 000 000 310 |
| $X_F$ | 0 | 0. 712 885 144 | 5/8 | + 0. 445 553 215 |
| 1.0 | 1 | 0. 136 160 337 | 1/8 | + 0. 017 020 042 |
| | 2 | 0. 007 217 088 | - 11/8 | - 0. 009 923 496 |
| | 3 | 0. 000 177 459 | - 31/8 | - 0. 000 687 653 |
| | 4 | 0. 000 002 515 | - 59/8 | - 0. 000 018 548 |
| | 5 | 0. 000 000 023 | - 95/8 | - 0. 000 000 273 |
| | 6 | 0. 000 000 000 | - 139/8 | 0. 000 000 000 |
| $X_F$ | 0 | 0. 693 783 622 | 10/27 | + 0. 256 956 897 |
| 1.5 | 1 | 0. 354 724 664 | 6/27 | + 0. 078 827 703 |
| | 2 | 0. 045 661 942 | - 6/27 | - 0. 010 147 098 |
| | 3 | 0. 002 633 508 | - 26/27 | - 0. 002 535 970 |
| | 4 | 0. 000 086 214 | - 54/27 | - 0. 000 172 428 |
| | 5 | 0. 000 001 819 | - 90/27 | - 0. 000 006 063 |
| | 6 | 0. 000 000 026 | - 134/27 | - 0. 000 000 129 |
| | 7 | 0. 000 000 000 | | 0. 000 000 000 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col I x Col. II |
|---|---|---|---|---|
| 2.0 | 0 | 0. 512 367 075 | 17/64 | + 0. 136 097 504 |
| | 1 | 0. 578 410 403 | 13/64 | + 0. 117 489 613 |
| | 2 | 0. 148 238 930 | 1/64 | + 0. 023 162 332 |
| | 3 | 0. 016 152 274 | - 19/64 | - 0. 004 795 206 |
| | 4 | 0. 000 976 205 | - 47/64 | - 0. 000 716 900 |
| | 5 | 0. 000 037 604 | - 83/64 | - 0. 000 048 767 |
| | 6 | 0. 000 001 004 | - 127/64 | - 0. 000 001 992 |
| | 7 | 0. 000 000 019 | - 179/64 | - 0. 000 000 053 |
| | 8 | 0. 000 000 000 | - 239/64 | 0. 000 000 000 |
| 2.5 | 0 | 0. 357 655 956 | 26/125 | + 0. 074 392 438 |
| | 1 | 0. 685 235 093 | 22/125 | + 0. 120 601 376 |
| | 2 | 0. 320 403 863 | 10/125 | + 0. 025 632 309 |
| | 3 | 0. 059 263 317 | - 10/125 | - 0. 004 741 065 |
| | 4 | 0. 005 886 907 | - 38/125 | - 0. 001 789 619 |
| | 5 | 0. 000 366 624 | - 74/125 | - 0. 000 217 041 |
| | 6 | 0. 000 015 697 | - 118/125 | - 0. 000 014 817 |
| | 7 | 0. 000 000 490 | - 170/125 | - 0. 000 000 666 |
| | 8 | 0. 000 000 011 | - 230/125 | - 0. 000 000 020 |
| | 9 | 0. 000 000 000 | | 0. 000 000 000 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 3.0 | 0 | 0. 353 110 606 | 37/216 | + 0. 060 486 538 |
| | 1 | 0. 629 794 464 | 33/216 | + 0. 096 218 598 |
| | 2 | 0. 515 026 080 | 21/216 | + 0. 050 071 980 |
| | 3 | 0. 152 939 006 | 1/216 | + 0. 000 708 050 |
| | 4 | 0. 023 352 355 | - 27/216 | - 0. 002 919 044 |
| | 5 | 0. 002 187 032 | - 63/216 | - 0. 000 637 884 |
| | 6 | 0. 000 139 086 | - 109/216 | - 0. 000 070 186 |
| | 7 | 0. 000 006 415 | - 159/216 | - 0. 000 004 722 |
| | 8 | 0. 000 000 224 | - 219/216 | - 0. 000 000 227 |
| | 9 | 0. 000 000 006 | - 287/216 | - 0. 000 000 007 |
| | 10 | 0. 000 000 000 | - 363/216 | 0. 000 000 000 |
| 3.5 | 0 | 0. 477 320 154 | 50/343 | + 0. 069 580 197 |
| | 1 | 0. 482 002 977 | 46/343 | + 0. 064 641 798 |
| | 2 | 0. 649 558 564 | 34/343 | + 0. 064 387 729 |
| | 3 | 0. 301 662 240 | 14/343 | + 0. 012 312 744 |
| | 4 | 0. 068 078 671 | - 14/343 | - 0. 002 778 721 |
| | 5 | 0. 009 158 163 | - 50/343 | - 0. 001 335 009 |
| | 6 | 0. 000 823 402 | - 94/343 | - 0. 000 225 655 |
| | 7 | 0. 000 053 181 | - 146/343 | - 0. 000 022 636 |
| | 8 | 0. 000 002 591 | - 206/343 | - 0. 000 001 556 |
| | 9 | 0. 000 000 097 | - 274/343 | - 0. 000 000 077 |
| | 10 | 0. 000 000 002 | - 350/343 | - 0. 000 000 002 |
| | 11 | 0. 000 000 000 | | 0. 000 000 000 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 4.0 | 0 | 0. 605 373 413 | 65/512 | + 0. 076 854 046 |
| | 1 | 0. 370 737 067 | 61/512 | + 0. 044 169 845 |
| | 2 | 0. 661 869 274 | 49/512 | + 0. 063 342 957 |
| | 3 | 0. 476 094 502 | 29/512 | + 0. 026 966 290 |
| | 4 | 0. 155 505 425 | 1/512 | + 0. 000 303 721 |
| | 5 | 0. 029 184 531 | - 35/512 | - 0. 001 995 036 |
| | 6 | 0. 003 587 859 | - 79/512 | - 0. 000 553 595 |
| | 7 | 0. 000 313 066 | - 131/512 | - 0. 000 080 100 |
| | 8 | 0. 000 020 463 | - 191/512 | - 0. 000 007 633 |
| | 9 | 0. 000 001 041 | - 259/512 | - 0. 000 000 526 |
| | 10 | 0. 000 000 042 | - 335/512 | - 0. 000 000 027 |
| | 11 | 0. 000 000 001 | - 419/512 | 0. 000 000 000 |
| | 12 | 0. 000 000 000 | - 511/512 | 0. 000 000 000 |
| 4.5 | 0 | 0. 626 133 219 | 82/729 | + 0. 070 429 250 |
| | 1 | 0. 380 821 433 | 78/729 | + 0. 040 746 326 |
| | 2 | 0. 561 756 623 | 66/729 | + 0. 050 858 624 |
| | 3 | 0. 616 795 478 | 46/729 | + 0. 038 919 879 |
| | 4 | 0. 289 334 599 | 18/729 | + 0. 007 144 064 |
| | 5 | 0. 074 454 017 | - 18/729 | - 0. 001 838 370 |
| | 6 | 0. 012 236 616 | - 62/729 | - 0. 001 040 699 |
| | 7 | 0. 001 406 315 | - 114/729 | - 0. 000 219 917 |
| | 8 | 0. 000 119 930 | - 174/729 | - 0. 000 028 625 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 4.5 | 9 | 0. 000 007 912 | - 242/729 | - 0. 000 002 626 |
| | 10 | 0. 000 000 415 | - 318/729 | - 0. 000 000 181 |
| | 11 | 0. 000 000 017 | - 402/729 | - 0. 000 000 009 |
| | 12 | 0. 000 000 000 | | 0. 000 000 000 |
| 5.0 | 0 | 0. 533 505 648 | 101/1000 | + 0. 053 884 070 |
| | 1 | 0. 490 030 902 | 97/1000 | + 0. 047 533 191 |
| | 2 | 0. 431 653 523 | 85/1000 | + 0. 036 690 549 |
| | 3 | 0. 665 715 051 | 65/1000 | + 0. 043 271 478 |
| | 4 | 0. 449 004 134 | 37/1000 | + 0. 016 613 152 |
| | 5 | 0. 157 148 449 | 1/1000 | + 0. 000 157 148 |
| | 6 | 0. 034 031 921 | - 43/1000 | - 0. 001 463 372 |
| | 7 | 0. 005 059 838 | - 95/1000 | - 0. 000 480 684 |
| | 8 | 0. 000 551 865 | - 155/1000 | - 0. 000 085 539 |
| | 9 | 0. 000 046 219 | - 223/1000 | - 0. 000 010 306 |
| | 10 | 0. 000 003 073 | - 299/1000 | - 0. 000 000 918 |
| | 11 | 0. 000 000 166 | - 383/1000 | - 0. 000 000 063 |
| | 12 | 0. 000 000 007 | - 475/1000 | - 0. 000 000 003 |
| | 13 | 0. 000 000 000 | | 0. 000 000 000 |
| 5.5 | 0 | 0. 419 899 435 | 122/1331 | + 0. 038 488 152 |
| | 1 | 0. 596 684 733 | 118/1331 | + 0. 052 899 172 |
| | 2 | 0. 369 336 700 | 106/1331 | + 0. 029 413 741 |
| | 3 | 0. 607 622 551 | 86/1331 | + 0. 039 260 360 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 5.5 | 4 | 0. 589 246 519 | 58/1331 | + 0. 025 677 158 |
| | 5 | 0. 280 391 019 | 22/1331 | + 0. 004 634 562 |
| | 6 | 0. 079 377 010 | - 22/1331 | - 0. 001 312 016 |
| | 7 | 0. 015 082 389 | - 74/1331 | - 0. 000 838 540 |
| | 8 | 0. 002 073 298 | - 134/1331 | - 0. 000 208 731 |
| | 9 | 0. 000 216 866 | - 202/1331 | - 0. 000 032 912 |
| | 10 | 0. 000 017 897 | - 278/1331 | - 0. 000 003 738 |
| | 11 | 0. 000 001 196 | - 362/1331 | - 0. 000 000 325 |
| | 12 | 0. 000 000 065 | - 454/1331 | - 0. 000 000 022 |
| | 13 | 0. 000 000 002 | - 554/1331 | 0. 000 000 000 |
| | 14 | 0. 000 000 000 | | |
| 6.0 | 0 | 0. 387 061 090 | 145/1728 | + 0. 032 479 084 |
| | 1 | 0. 610 508 194 | 141/1728 | + 0. 049 815 772 |
| | 2 | 0. 415 371 255 | 129/1728 | + 0. 031 008 617 |
| | 3 | 0. 488 842 218 | 109/1728 | + 0. 030 835 533 |
| | 4 | 0. 659 096 022 | 81/1728 | + 0. 030 895 126 |
| | 5 | 0. 428 715 113 | 45/1728 | + 0. 011 164 456 |
| | 6 | 0. 158 302 631 | 1/1728 | + 0. 000 091 610 |
| | 7 | 0. 038 154 749 | - 51/1728 | - 0. 001 126 095 |
| | 8 | 0. 006 542 095 | - 111/1728 | - 0. 000 420 238 |
| | 9 | 0. 000 844 335 | - 179/1728 | - 0. 000 087 462 |
| | 10 | 0. 000 085 347 | - 255/1728 | - 0. 000 012 594 |
| | 11 | 0. 000 006 958 | - 339/1728 | - 0. 000 001 365 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col I x Col. II |
|---|---|---|---|---|
| 6.0 | 12 | 0. 000 000 467 | - 431/1728 | - 0. 000 000 116 |
| | 13 | 0. 000 000 026 | - 531/1728 | - 0. 000 000 007 |
| | 14 | 0. 000 000 001 | - 639/1728 | - 0. 000 000 000 |
| | 15 | 0. 000 000 000 | | |
| 6.5 | 0 | 0. 457 211 234 | 170/2197 | + 0. 035 378 201 |
| | 1 | 0. 527 529 286 | 166/2197 | + 0. 039 858 835 |
| | 2 | 0. 524 209 470 | 154/2197 | + 0. 036 744 769 |
| | 3 | 0. 392 589 911 | 134/2197 | + 0. 023 944 946 |
| | 4 | 0. 633 160 860 | 106/2197 | + 0. 030 548 498 |
| | 5 | 0. 566 184 662 | 70/2197 | + 0. 018 039 565 |
| | 6 | 0. 273 496 230 | 26/2197 | + 0. 003 236 641 |
| | 7 | 0. 083 347 354 | - 26/2197 | - 0. 000 986 359 |
| | 8 | 0. 017 703 573 | - 87/2197 | - 0. 000 701 051 |
| | 9 | 0. 002 794 068 | - 154/2197 | - 0. 000 195 851 |
| | 10 | 0. 000 342 385 | - 230/2197 | - 0. 000 035 843 |
| | 11 | 0. 000 033 636 | - 314/2197 | - 0. 000 004 807 |
| | 12 | 0. 000 002 714 | - 406/2197 | - 0. 000 000 501 |
| | 13 | 0. 000 000 183 | - 506/2197 | - 0. 000 000 042 |
| | 14 | 0. 000 000 010 | - 614/2197 | - 0. 000 000 002 |
| | 15 | 0. 000 000 000 | | 0. 000 000 000 |

| $X_F$ | n | I $X_F\, g_n\,(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 7.0 | 0 | 0. 560 338 910 | 197/2744 | + 0. 040 228 412 |
| | 1 | 0. 426 963 756 | 193/2744 | + 0. 030 030 614 |
| | 2 | 0. 603 773 162 | 181/2744 | + 0. 039 826 145 |
| | 3 | 0. 383 395 514 | 161/2744 | + 0. 022 495 144 |
| | 4 | 0. 534 200 433 | 133/2744 | + 0. 025 892 367 |
| | 5 | 0. 648 507 631 | 97/2744 | + 0. 022 924 650 |
| | 6 | 0. 412 762 283 | 53/2744 | + 0. 007 972 449 |
| | 7 | 0. 159 164 310 | 1/2744 | + 0. 000 058 004 |
| | 8 | 0. 041 727 497 | - 59/2744 | - 0. 000 897 202 |
| | 9 | 0. 008 003 348 | - 127/2744 | - 0. 000 370 417 |
| | 10 | 0. 001 179 708 | - 203/2744 | - 0. 000 087 274 |
| | 11 | 0. 000 138 421 | - 287/2744 | - 0. 000 014 477 |
| | 12 | 0. 000 013 273 | - 379/2744 | - 0. 000 001 833 |
| | 13 | 0. 000 001 060 | - 479/2744 | - 0. 000 000 185 |
| | 14 | 0. 000 000 070 | - 587/2744 | - 0. 000 000 014 |
| | 15 | 0. 000 000 003 | - 703/2744 | - 0. 000 000 000 |
| | 16 | 0. 000 000 000 | | |
| 7.5 | 0 | 0. 602 580 962 | 226/3375 | + 0. 040 350 606 |
| | 1 | 0. 397 476 924 | 222/3375 | + 0. 026 145 148 |
| | 2 | 0. 591 495 181 | 210/3375 | + 0. 036 804 144 |
| | 3 | 0. 461 039 047 | 190/3375 | + 0. 025 954 790 |
| | 4 | 0. 426 575 392 | 162/3375 | + 0. 020 475 618 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| | 5 | 0. 646 621 617 | 126/3375 | + 0. 024 140 540 |
| | 6 | 0. 546 671 140 | 82/3375 | + 0. 013 282 083 |
| | 7 | 0. 267 956 267 | 30/3375 | + 0. 002 381 833 |
| | 8 | 0. 086 649 926 | - 30/3375 | - 0. 000 770 221 |
| | 9 | 0. 020 121 076 | - 98/3375 | - 0. 000 584 256 |
| | 10 | 0. 003 547 570 | - 174/3375 | - 0. 000 182 896 |
| 7.5 | 11 | 0. 000 493 786 | - 258/3375 | - 0. 000 037 747 |
| | 12 | 0. 000 055 841 | - 350/3375 | - 0. 000 005 790 |
| | 13 | 0. 000 005 244 | - 450/3375 | - 0. 000 000 699 |
| | 14 | 0. 000 000 415 | - 558/3375 | - 0. 000 000 068 |
| | 15 | 0. 000 000 027 | - 674/3375 | - 0. 000 000 005 |
| | 16 | 0. 000 000 001 | - 798/3375 | 0. 000 000 000 |
| | 17 | 0. 000 000 000 | | |
| X | 0. | 0. 550 432 596 | 257/4096 | + 0. 034 536 420 |
| | 1 | 0. 460 035 421 | 253/4096 | + 0. 028 415 273 |
| | 2 | 0. 503 882 916 | 241/4096 | + 0. 029 647 407 |
| | 3 | 0. 561 356 186 | 221/4096 | + 0. 030 288 016 |
| 8.0 | 4 | 0. 378 842 363 | 193/4096 | + 0. 017 850 726 |
| | 5 | 0. 568 377 328 | 157/4096 | + 0. 021 785 947 |
| | 6 | 0. 636 599 480 | 113/4096 | + 0. 017 562 436 |
| | 7 | 0. 399 776 976 | 61/4096 | + 0. 005 953 709 |
| | 8 | 0. 159 835 894 | 1/4096 | + 0. 000 039 022 |
| | 9 | 0. 044 870 590 | - 67/4096 | - 0. 000 733 967 |
| | 10 | 0. 009 427 716 | - 143/4096 | - 0. 000 329 141 |

| | | I | II | III |
|---|---|---|---|---|
| | | $X_F\, g_n(X_F)$ | $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right] \frac{1}{X_F}$ | Col. I x Col. II |
| X | n | | | |
| 8.0 | 11 | 0. 001 548 725 | - 227/4096 | - 0. 000 085 830 |
| | 12 | 0. 000 205 299 | - 319/4096 | - 0. 000 015 988 |
| | 13 | 0. 000 022 491 | - 419/4096 | - 0. 000 002 300 |
| | 14 | 0. 000 002 073 | - 527/4096 | - 0. 000 000 267 |
| | 15 | 0. 000 000 162 | - 643/4096 | - 0. 000 000 025 |
| | 16 | 0. 000 000 010 | - 767/4096 | - 0. 000 000 002 |
| | 17 | 0. 000 000 000 | - 899/4096 | - 0. 000 000 000 |
| | 18 | 0. 000 000 000 | | - 0. 000 000 000 |
| $X_F$ | n | | | |
| 8.5 | 0 | 0. 456 276 133 | 290/4913 | + 0. 026 932 643 |
| | 1 | 0. 553 944 625 | 286/4913 | + 0. 032 246 725 |
| | 2 | 0. 419 014 052 | 074/4913 | + 0. 023 368 583 |
| | 3 | 0. 606 058 171 | 254/4913 | + 0. 031 332 948 |
| | 4 | 0. 418 509 111 | 226/4913 | + 0. 019 251 589 |
| | 5 | 0. 461 364 680 | 190/4913 | + 0. 017 842 314 |
| | 6 | 0. 652 760 074 | 146/4913 | + 0. 019 398 121 |
| | 7 | 0. 529 940 922 | 94/4913 | + 0. 010 139 313 |
| | 8 | 0. 263 369 189 | 34/4913 | + 0. 001 822 624 |
| | 9 | 0. 089 461 279 | - 34/4913 | - 0. 000 619 109 |
| | 10 | 0. 022 357 639 | - 110/4913 | - 0. 000 500 578 |
| | 11 | 0. 004 319 249 | - 194/4913 | - 0. 000 170 554 |
| | 12 | 0. 000 668 044 | - 286/4913 | - 0. 000 038 888 |
| | 13 | 0. 000 084 909 | - 386/4913 | - 0. 000 006 671 |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| 8.5 | 14 | 0. 000 009 049 | - 494/4913 | - 0. 000 000 909 |
| | 15 | 0. 000 000 821 | - 610/4913 | - 0. 000 000 101 |
| | 16 | 0. 000 000 064 | - 734/4913 | - 0. 000 000 009 |
| | 17 | 0. 000 000 004 | - 866/4913 | 0. 000 000 000 |
| | 18 | 0. 000 000 000 | | |
| X | 0 | 0. 406 652 858 | 325/5832 | + 0. 022 661 553 |
| | 1 | 0. 594 647 743 | 321/5832 | + 0. 032 730 096 |
| | 2 | 0. 408 326 750 | 309/5832 | + 0. 021 634 596 |
| | 3 | 0. 563 696 848 | 289/5832 | + 0. 027 933 537 |
| | 4 | 0. 512 297 573 | 261/5832 | + 0. 022 926 897 |
| | 5 | 0. 389 533 784 | 225/5832 | + 0. 015 028 309 |
| | 6 | 0. 593 597 194 | 181/5832 | + 0. 018 422 683 |
| | 7 | 0. 624 522 018 | 129/5832 | + 0. 013 814 015 |
| 9.0 | 8 | 0. 388 929 661 | 69/5832 | + 0. 004 601 534 |
| | 9 | 0. 160 376 341 | 1/5832 | + 0. 000 027 499 |
| | 10 | 0. 047 669 895 | - 75/5832 | - 0. 000 613 038 |
| | 11 | 0. 010 807 569 | - 159/5832 | - 0. 000 294 650 |
| | 12 | 0. 001 943 759 | - 251/5832 | - 0. 000 083 656 |
| | 13 | 0. 000 285 402 | - 351/5832 | - 0. 000 017 176 |
| | 14 | 0. 000 034 968 | - 459/5832 | - 0. 000 002 752 |
| | 15 | 0. 000 003 636 | - 375/5832 | - 0. 000 000 358 |
| | 16 | 0. 000 000 324 | - 699/5832 | - 0. 000 000 038 |
| | 17 | 0. 000 000 024 | - 831/5832 | - 0. 000 000 003 |
| | 18 | 0. 000 000 001 | - 971/5832 | 0. 000 000 000 |

| | I | II | III |
|---|---|---|---|
| | $X_F\, g_n(X_F)$ | $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | Col. I x Col. II |
| $X_F$ n | | | |
| 0. 0. | 443 464 430 | 362/6859 | + 0. 023 404 887 |
| 1 0. | 549 165 861 | 358/6859 | + 0. 028 663 271 |
| 2 0. | 476 676 200 | 346/6859 | + 0. 024 045 774 |
| 3 0. | 473 103 808 | 326/6859 | + 0. 022 486 053 |
| 4 0. | 589 581 782 | 298/6859 | + 0. 025 615 304 |
| 5 0. | 394 837 454 | 262/6859 | + 0. 015 081 996 |
| 6 0. | 493 209 854 | 218/6859 | + 0. 015 675 717 |
| 7 0. | 654 363 621 | 166/6859 | + 0. 015 836 763 |
| 8 0. | 515 415 315 | 106/6859 | + 0. 007 965 304 |
| 9.5 9 0. | 259 483 531 | 38/6859 | + 0. 001 437 581 |
| 10 0. | 091 897 788 | - 38/6859 | - 0. 000 509 129 |
| 11 0. | 024 434 380 | - 122/6859 | - 0. 000 434 610 |
| 12 0. | 005 099 007 | - 214/6859 | - 0. 000 159 088 |
| 13 0. | 000 862 175 | - 314/6859 | - 0. 000 039 469 |
| 14 0. | 000 120 983 | - 422/6859 | - 0. 000 007 443 |
| 15 0. | 000 014 353 | - 538/6859 | - 0. 000 001 125 |
| 16 0. | 000 001 460 | - 662/6859 | - 0. 000 000 140 |
| 17 0. | 000 000 128 | - 794/6859 | - 0. 000 000 014 |
| 18 0. | 000 000 009 | - 934/6859 | - 0. 000 000 001 |
| 19 0. | 000 000 000 | | |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Co. I x Col. II |
|---|---|---|---|---|
| | 0 | 0. 529 189 404 | 401/8000 | + 0. 026 525 618 |
| | 1 | 0. 462 356 280 | 397/8000 | + 0. 022 944 430 |
| | 2 | 0. 561 257 674 | 385/8000 | + 0. 027 010 525 |
| | 3 | 0. 410 087 907 | 365/8000 | + 0. 018 710 260 |
| | 4 | 0. 594 309 304 | 337/8000 | + 0. 025 035 279 |
| | 5 | 0. 469 183 050 | 301/8000 | + 0. 017 653 012 |
| | 6 | 0. 407 826 747 | 257/8000 | + 0. 013 101 434 |
| | 7 | 0. 611 971 799 | 205/8000 | + 0. 015 681 777 |
| | 8 | 0. 612 783 868 | 145/8000 | + 0. 011 106 707 |
| | 9 | 0. 379 684 055 | 77/8000 | + 0. 003 654 459 |
| 10.0 | 10 | 0. 160 822 152 | 1/8000 | + 0. 000 020 102 |
| | 11 | 0. 050 188 508 | - 83/8000 | - 0. 000 520 705 |
| | 12 | 0. 012 139 819 | - 175/8000 | - 0. 000 265 558 |
| | 13 | 0. 002 358 654 | - 275/8000 | - 0. 000 081 078 |
| | 14 | 0. 000 377 919 | - 383/8000 | - 0. 000 018 092 |
| | 15 | 0. 000 050 956 | - 499/8000 | - 0. 000 003 178 |
| | 16 | 0. 000 005 874 | - 623/8000 | - 0. 000 000 457 |
| | 17 | 0. 000 000 585 | - 755/8000 | - 0. 000 000 055 |
| | 18 | 0. 000 000 050 | - 895/8000 | - 0. 000 000 005 |
| | 19 | 0. 000 000 003 | - 1043/8000 | 0. 000 000 000 |
| | 20 | 0. 000 000 000 | | |

| | I | II | III |
|---|---|---|---|
| | $X_F\, g_n\,(X_F)$ | $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | Col. I x Col. II |
| $X_F$ n | | | |
| 0 | 0. 584 504 682 | 442/9261 | + 0. 027 896 670 |
| 1 | 0. 413 384 410 | 438/9261 | + 0. 019 551 060 |
| 2 | 0. 588 367 902 | 426/9261 | + 0. 027 064 542 |
| 3 | 0. 424 703 794 | 406/9261 | + 0. 018 618 911 |
| 4 | 0. 526 854 376 | 378/9261 | + 0. 021 504 260 |
| 5 | 0. 558 607 838 | 342/9261 | + 0. 020 628 860 |
| 6 | 0. 385 395 513 | 298/9261 | + 0. 012 401 237 |
| 7 | 0. 520 975 008 | 246/9261 | + 0. 013 836 662 |
| 8 | 0. 653 114 250 | 186/9261 | + 0. 013 117 293 |
| 9 | 0. 502 660 787 | 118/9261 | + 0. 006 404 704 |
| 10.5 10 | 0. 256 132 626 | 42/9261 | + 0. 001 161 599 |
| 11 | 0. 094 039 905 | - 42/9261 | - 0. 000 426 484 |
| 12 | 0. 026 369 909 | - 134/9261 | - 0. 000 381 553 |
| 13 | 0. 005 879 820 | - 234/9261 | - 0. 000 148 566 |
| 14 | 0. 001 073 422 | - 342/9261 | - 0. 000 039 640 |
| 15 | 0. 000 164 033 | - 458/9261 | - 0. 000 008 112 |
| 16 | 0. 000 021 348 | - 582/9261 | - 0. 000 001 341 |
| 17 | 0. 000 002 398 | - 714/9261 | - 0. 000 000 184 |
| 18 | 0. 000 000 234 | - 854/9261 | - 0. 000 000 021 |
| 19 | 0. 000 000 019 | - 1002/9261 | - 0. 000 000 002 |
| 20 | 0. 000 000 001 | - 1158/9261 | 0. 000 000 000 |
| 21 | 0. 000 000 000 | | |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| | 0 | 0. 561 195 556 | 485/10648 | + 0. 025 561 593 |
| | 1 | 0. 444 017 767 | 481/10648 | + 0. 020 057 526 |
| | 2 | 0. 537 322 101 | 469/10648 | + 0. 023 666 798 |
| | 3 | 0. 501 017 999 | 449/10648 | + 0. 021 126 698 |
| | 4 | 0. 442 820 736 | 421/10648 | + 0. 017 508 220 |
| | 5 | 0. 600 085 549 | 385/10648 | + 0. 021 697 308 |
| | 6 | 0. 435 960 126 | 341/10648 | + 0. 013 961 532 |
| | 7 | 0. 429 272 365 | 289/10648 | + 0. 011 650 987 |
| | 8 | 0. 625 182 897 | 229/10648 | + 0. 013 445 424 |
| | 9 | 0. 601 600 644 | 161/10648 | + 0. 009 096 328 |
| | 10 | 0. 371 675 819 | 85/10648 | + 0. 002 966 983 |
| 11.0 | 11 | 0. 161 197 213 | 1/10648 | + 0. 000 015 138 |
| | 12 | 0. 052 474 007 | - 91/10648 | - 0. 000 448 453 |
| | 13 | 0. 013 423 902 | - 191/10648 | - 0. 000 240 793 |
| | 14 | 0. 002 788 469 | - 299/10648 | - 0. 000 078 301 |
| | 15 | 0. 000 481 922 | - 415/10648 | - 0. 000 018 782 |
| | 16 | 0. 000 070 612 | - 539/10648 | - 0. 000 003 574 |
| | 17 | 0. 000 008 902 | - 671/10648 | - 0. 000 000 560 |
| | 18 | 0. 000 000 976 | - 811/10648 | - 0. 000 000 074 |
| | 19 | 0. 000 000 093 | - 959/10648 | - 0. 000 000 008 |
| | 20 | 0. 000 000 007 | - 1115/10648 | 0. 000 000 000 |
| | 21 | 0. 000 000 000 | | |

| | I | II | III |
|---|---|---|---|
| | $X_F\, g_n\,(X_F)$ | $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | Col. I x Col. II |
| $X_F$ n | | | |
| 0 | 0. 483 788 300 | 530/12167 | + 0. 021 074 036 |
| 1 | 0. 523 307 621 | 526/12167 | + 0. 022 623 474 |
| 2 | 0. 456 140 244 | 514/12167 | + 0. 019 269 835 |
| 3 | 0. 572 509 149 | 494/12167 | + 0. 023 244 803 |
| 4 | 0. 408 735 435 | 466/12167 | + 0. 015 654 698 |
| 5 | 0. 566 367 146 | 430/12167 | + 0. 020 016 263 |
| 6 | 0. 523 685 938 | 386/12167 | + 0. 016 614 019 |
| 7 | 0. 385 826 018 | 334/12167 | + 0. 010 591 426 |
| 8 | 0. 544 596 986 | 274/12167 | + 0. 012 264 286 |
| 9 | 0. 650 056 466 | 206/12167 | + 0. 011 006 113 |
| 10 | 0. 491 349 837 | 130/12167 | + 0. 005 249 895 |
| 11.5 11 | 0. 253 200 917 | 46/12167 | + 0. 000 951 281 |
| 12 | 0. 095 945 376 | - 46/12167 | - 0. 000 362 742 |
| 13 | 0. 028 180 284 | - 146/12167 | - 0. 000 338 154 |
| 14 | 0. 006 656 784 | - 254/12167 | - 0. 000 138 967 |
| 15 | 0. 001 299 301 | - 370/12167 | - 0. 000 039 511 |
| 16 | 0. 000 213 901 | - 494/12167 | - 0. 000 008 684 |
| 17 | 0. 000 030 185 | - 626/12167 | - 0. 000 001 553 |
| 18 | 0. 000 003 698 | - 766/12167 | - 0. 000 000 232 |
| 19 | 0. 000 000 396 | - 914/12167 | - 0. 000 000 029 |
| 20 | 0. 000 000 036 | - 1070/12167 | - 0. 000 000 003 |
| 21 | 0. 000 000 002 | - 1234/12167 | - 0. 000 000 000 |
| 22 | 0. 000 000 000 | | |

| $X_F$ | n | I $X_F\, g_n(X_F)$ | II $\left[\frac{1}{2} + \frac{1-4n^2}{8X_F^2}\right]\frac{1}{X_F}$ | III Col. I x Col. II |
|---|---|---|---|---|
| | 0 | 0. 424 278 183 | 577/13824 | + 0. 017 708 949 |
| | 1 | 0. 578 316 248 | 573/13824 | + 0. 023 971 007 |
| | 2 | 0. 417 045 889 | 561/13824 | + 0. 016 924 388 |
| | 3 | 0. 579 341 641 | 541/13824 | + 0. 022 672 441 |
| | 4 | 0. 449 319 414 | 513/13824 | + 0. 016 673 962 |
| | 5 | 0. 485 746 073 | 477/13824 | + 0. 016 760 769 |
| | 6 | 0. 589 080 534 | 433/13824 | + 0. 018 451 379 |
| | 7 | 0. 412 755 984 | 381/13824 | + 0. 011 375 870 |
| | 8 | 0. 451 380 998 | 321/13824 | + 0. 010 481 286 |
| | 9 | 0. 634 501 906 | 253/13824 | + 0. 011 612 339 |
| 12.0 | 10 | 0. 591 048 765 | 177/13824 | + 0. 007 567 681 |
| | 11 | 0. 364 647 487 | 93/13824 | + 0. 002 453 140 |
| | 12 | 0. 161 517 859 | 1/13824 | + 0. 000 011 683 |
| | 13 | 0. 054 563 084 | - 99/13824 | - 0. 000 390 751 |
| | 14 | 0. 014 660 657 | - 207/13824 | - 0. 000 219 528 |
| | 15 | 0. 003 229 253 | - 323/13824 | - 0. 000 075 452 |
| | 16 | 0. 000 596 456 | - 447/13824 | - 0. 000 019 286 |
| | 17 | 0. 000 094 020 | - 579/13824 | - 0. 000 003 937 |
| | 18 | 0. 000 012 826 | - 719/13824 | - 0. 000 000 667 |
| | 19 | 0. 000 001 530 | - 867/13824 | - 0. 000 000 095 |
| | 20 | 0. 000 000 160 | - 1023/13824 | - 0. 000 000 011 |
| | 21 | 0. 000 000 014 | - 1187/13824 | - 0. 000 000 001 |
| | 22 | 0. 000 000 001 | - 1359/13824 | - 0. 000 000 000 |
| | 23 | 0. 000 000 000 | | |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 0.5 | 0 | - 0. 382 598 843 | - 0. 220 025 292 | 0. 317 106 269 |
| | 1 | - 0. 057 451 742 | + 0. 105 121 808 | 0. 008 040 832 |
| | 2 | - 0. 001 238 319 | + 0. 004 828 399 | 0. 000 072 384 |
| | 3 | - 0. 000 010 469 | + 0. 000 062 063 | 0. 000 000 356 |
| | 4 | - 0. 000 000 047 | + 0. 000 000 374 | 0. 000 000 017 |
| | 5 | - 0. 000 000 000 | + 0. 000 000 001 | 0. 000 000 001 |
| | 6 | | 0. 000 000 000 | 0. 000 000 000 |
| 1.0 | 0 | - 0. 027 986 347 | - 0. 144 181 201 | 0. 273 385 667 |
| | 1 | - 0. 044 104 253 | + 0. 055 972 694 | 0. 028 888 483 |
| | 2 | - 0. 004 249 464 | + 0. 015 237 952 | 0. 001 064 992 |
| | 3 | - 0. 000 150 303 | + 0. 000 858 085 | 0. 000 020 129 |
| | 4 | - 0. 000 002 772 | + 0. 000 021 556 | 0. 000 000 236 |
| | 5 | - 0. 000 000 031 | + 0. 000 000 308 | 0. 000 000 004 |
| | 6 | - 0. 000 000 000 | + 0. 000 000 002 | 0. 000 000 002 |
| | | | 0. 000 000 000 | 0. 000 000 000 |
| 1.5 | 0 | + 0. 014 447 330 | - 0. 056 509 826 | 0. 214 894 401 |
| | 1 | - 0. 027 005 070 | + 0. 002 499 686 | 0. 054 322 319 |
| | 2 | - 0. 007 335 232 | + 0. 022 169 524 | 0. 004 687 194 |
| | 3 | - 0. 000 632 996 | + 0. 003 373 428 | 0. 000 204 462 |
| | 4 | - 0. 000 027 413 | + 0. 000 205 241 | 0. 000 005 400 |
| | 5 | - 0. 000 000 718 | + 0. 000 006 883 | 0. 000 000 102 |
| | 6 | - 0. 000 000 012 | + 0. 000 000 147 | 0. 000 000 006 |
| | 7 | - 0. 000 000 000 | + 0. 000 000 002 | 0. 000 000 002 |
| | | | + 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 2.0 | 0 | + 0. 012 410 931 | + 0. 008 255 416 | 0. 156 763 851 |
| | 1 | - 0. 011 379 004 | - 0. 031 013 425 | 0. 075 097 184 |
| | 2 | - 0. 008 785 283 | + 0. 018 630 301 | 0. 033 007 350 |
| | 3 | - 0. 001 533 986 | + 0. 007 306 911 | 0. 000 977 719 |
| | 4 | - 0. 000 125 895 | + 0. 000 889 841 | 0. 000 047 046 |
| | 5 | - 0. 000 006 095 | + 0. 000 056 374 | 0. 000 001 512 |
| | 6 | - 0. 000 000 195 | + 0. 000 002 225 | 0. 000 000 038 |
| | 7 | - 0. 000 000 004 | + 0. 000 000 060 | 0. 000 000 003 |
| | 8 | 0. 000 000 000 | + 0. 000 000 001 | 0. 000 000 001 |
| 2.5 | 0 | + 0. 003 551 935 | + 0. 032 757 913 | 0. 110 702 286 |
| | 1 | - 0. 000 931 302 | - 0. 034 620 518 | 0. 085 049 556 |
| | 2 | - 0. 007 824 652 | + 0. 005 184 534 | 0. 022 992 191 |
| | 3 | - 0. 002 620 974 | + 0. 010 388 206 | 0. 003 026 167 |
| | 4 | - 0. 000 368 104 | + 0. 002 392 806 | 0. 000 235 083 |
| | 5 | - 0. 000 029 356 | + 0. 000 258 467 | 0. 000 012 070 |
| | 6 | - 0. 000 001 525 | + 0. 000 016 786 | 0. 000 000 444 |
| | 7 | - 0. 000 000 056 | + 0. 000 000 736 | 0. 000 000 014 |
| | 8 | - 0. 000 000 001 | + 0. 000 000 023 | 0. 000 000 002 |
| | 9 | - 0. 000 000 000 | + 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F)-J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 3.0 | 0 | - 0. 002 092 295 | + 0. 023 056 988 | 0. 081 451 231 |
| | 1 | + 0. 003 373 239 | - 0. 016 310 510 | 0. 083 281 327 |
| | 2 | - 0. 004 967 244 | - 0. 010 304 945 | 0. 034 799 791 |
| | 3 | - 0. 003 414 400 | + 0. 009 687 517 | 0. 006 981 167 |
| | 4 | - 0. 000 785 166 | + 0. 004 517 555 | 0. 000 813 345 |
| | 5 | - 0. 000 096 721 | + 0. 000 796 557 | 0. 000 061 952 |
| | 6 | - 0. 000 007 571 | + 0. 000 079 803 | 0. 000 002 046 |
| | 7 | - 0. 000 000 413 | + 0. 000 005 270 | 0. 000 000 135 |
| | 8 | - 0. 000 000 016 | + 0. 000 000 248 | 0. 000 000 005 |
| | 9 | + 0. 000 000 000 | + 0. 000 000 008 | 0. 000 000 001 |
| | 10 | + 0. 000 000 000 | + 0. 000 000 000 | 0. 000 000 000 |
| 3.5 | 0 | - 0. 003 062 033 | + 0. 000 334 487 | 0. 066 852 651 |
| | 1 | - 0. 003 075 685 | + 0. 005 816 884 | 0. 073 534 367 |
| | 2 | - 0. 001 610 185 | - 0. 018 408 996 | 0. 044 368 548 |
| | 3 | - 0. 000 461 189 | + 0. 004 082 598 | 0. 012 934 153 |
| | 4 | - 0. 001 305 821 | + 0. 006 237 966 | 0. 002 153 424 |
| | 5 | - 0. 000 240 197 | + 0. 001 806 633 | 0. 000 231 427 |
| | 6 | - 0. 000 027 098 | + 0. 000 270 162 | 0. 000 017 409 |
| | 7 | - 0. 000 002 093 | + 0. 000 025 701 | 0. 000 000 972 |
| | 8 | - 0. 000 000 118 | + 0. 000 001 717 | 0. 000 000 043 |
| | 9 | - 0. 000 000 005 | + 0. 000 000 085 | 0. 000 000 003 |
| | 10 | - 0. 000 000 000 | + 0. 000 000 003 | 0. 000 000 001 |
| | 11 | | 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 4.0 | 0 | - 0. 001 341 021 | - 0. 014 664 771 | 0. 060 848 254 |
| | 1 | + 0. 000 882 747 | + 0. 016 430 267 | 0. 061 482 859 |
| | 2 | + 0. 000 823 104 | - 0. 014 903 343 | 0. 049 262 718 |
| | 3 | - 0. 002 637 311 | - 0. 004 212 947 | 0. 020 116 032 |
| | 4 | - 0. 001 745 742 | + 0. 006 070 880 | 0. 004 628 859 |
| | 5 | - 0. 000 474 742 | + 0. 003 147 631 | 0. 000 677 853 |
| | 6 | - 0. 000 075 186 | + 0. 000 697 558 | 0. 000 068 777 |
| | 7 | - 0. 000 007 962 | + 0. 000 093 193 | 0. 000 005 131 |
| | 8 | - 0. 000 000 609 | + 0. 000 008 536 | 0. 000 000 294 |
| | 9 | - 0. 000 000 035 | + 0. 000 000 575 | 0. 000 000 014 |
| | 10 | - 0. 000 000 001 | + 0. 000 000 029 | 0. 000 000 001 |
| | 11 | 0. 000 000 000 | + 0. 000 000 001 | 0. 000 000 001 |
| | | | + 0. 000 000 000 | |
| 4.5 | 0 | + 0. 000 557 614 | - 0. 013 628 432 | 0. 057 358 432 |
| | 1 | - 0. 000 894 119 | + 0. 011 840 193 | 0. 051 692 400 |
| | 2 | 0. 001 638 708 | - 0. 003 497 120 | 0. 049 000 212 |
| | 3 | - 0. 001 261 213 | - 0. 010 624 992 | 0. 027 033 674 |
| | 4 | - 0. 001 883 130 | + 0. 003 127 230 | 0. 008 388 164 |
| | 5 | - 0. 000 769 716 | + 0. 004 240 643 | 0. 001 632 557 |
| | 6 | - 0. 000 169 091 | + 0. 001 427 419 | 0. 000 217 629 |
| | 7 | - 0. 000 024 041 | + 0. 000 265 108 | 0. 000 002 115 |
| | 8 | - 0. 000 002 427 | + 0. 000 032 621 | 0. 000 001 569 |
| | 9 | - 0. 000 000 184 | + 0. 000 002 903 | 0. 000 000 093 |
| | 10 | - 0. 000 000 010 | + 0. 000 000 197 | 0. 000 000 006 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 4.5 | 11 | - 0. 000 000 000 | + 0. 000 000 010 | 0. 000 000 001 |
| | 12 | | + 0. 000 000 000 | 0. 000 000 000 |
| 5.0 | 0 | + 0. 001 229 678 | - 0. 002 173 637 | 0. 052 940 111 |
| | 1 | - 0. 001 273 151 | - 0. 000 372 665 | 0. 045 887 375 |
| | 2 | + 0. 001 098 013 | + 0. 007 311 022 | 0. 045 099 584 |
| | 3 | + 0. 000 072 294 | - 0. 011 269 311 | 0. 032 074 461 |
| | 4 | - 0. 001 589 270 | - 0. 001 878 619 | 0. 013 145 263 |
| | 5 | - 0. 001 037 430 | + 0. 004 218 478 | 0. 003 338 196 |
| | 6 | - 0. 000 316 851 | + 0. 002 353 611 | 0. 000 573 388 |
| | 7 | - 0. 000 059 785 | + 0. 000 611 602 | 0. 000 071 133 |
| | 8 | - 0. 000 007 833 | + 0. 000 100 058 | 0. 000 006 686 |
| | 9 | - 0. 000 000 762 | + 0. 000 011 562 | 0. 000 000 494 |
| | 10 | - 0. 000 000 057 | + 0. 000 001 005 | 0. 000 000 030 |
| | 11 | - 0. 000 000 003 | + 0. 000 000 068 | 0. 000 000 002 |
| | 12 | 0. 000 000 000 | + 0. 000 000 003 | 0. 000 000 000 |
| 5.5 | 0 | + 0. 000 707 397 | + 0. 008 035 596 | 0. 047 231 244 |
| | 1 | + 0. 000 574 576 | - 0. 009 184 848 | 0. 043 139 748 |
| | 2 | + 0. 000 062 146 | + 0. 010 582 588 | 0. 040 058 475 |
| | 3 | + 0. 000 832 991 | - 0. 005 833 224 | 0. 034 260 127 |
| | 4 | - 0. 000 929 635 | - 0. 006 601 806 | 0. 018 145 717 |
| | 5 | - 0. 001 158 794 | + 0. 002 450 942 | 0. 005 926 710 |
| | 6 | - 0. 000 502 478 | + 0. 003 107 258 | 0. 001 292 764 |
| | 7 | - 0. 000 125 493 | + 0. 001 165 580 | 0. 000 201 547 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 5.5 | 8 | - 0. 000 021 115 | + 0. 000 253 469 | 0. 000 023 623 |
| | 9 | - 0. 000 002 595 | + 0. 000 037 669 | 0. 000 002 162 |
| | 10 | - 0. 000 000 245 | + 0. 000 004 142 | 0. 000 000 159 |
| | 11 | - 0. 000 000 018 | + 0. 000 000 353 | 0. 000 000 010 |
| | 12 | - 0. 000 000 001 | + 0. 000 000 024 | 0. 000 000 001 |
| | 13 | 0. 000 000 000 | + 0. 000 000 001 | 0. 000 000 001 |
| | 14 | | 0. 000 000 000 | 0. 000 000 000 |
| 6.0 | 0 | - 0. 000 165 587 | + 0. 009 310 296 | 0. 041 623 793 |
| | 1 | + 0. 000 294 897 | - 0. 008 720 500 | 0. 041 390 169 |
| | 2 | - 0. 000 633 676 | + 0. 005 595 997 | 0. 035 970 938 |
| | 3 | + 0. 000 846 266 | + 0. 002 016 309 | 0. 033 698 108 |
| | 4 | - 0. 000 156 581 | - 0. 008 346 556 | 0. 022 391 989 |
| | 5 | - 0. 001 043 319 | - 0. 000 833 991 | 0. 009 287 146 |
| | 6 | - 0. 000 678 056 | + 0. 003 130 512 | 0. 002 544 066 |
| | 7 | - 0. 000 225 834 | + 0. 001 844 483 | 0. 000 492 554 |
| | 8 | - 0. 000 048 581 | + 0. 000 539 893 | 0. 000 071 074 |
| | 9 | - 0. 000 007 473 | + 0. 000 102 891 | 0. 000 007 956 |
| | 10 | - 0. 000 000 872 | + 0. 000 014 179 | 0. 000 000 713 |
| | 11 | - 0. 000 000 080 | + 0. 000 001 497 | 0. 000 000 052 |
| | 12 | - 0. 000 000 006 | + 0. 000 000 126 | 0. 000 000 004 |
| | 13 | 0. 000 000 000 | + 0. 000 000 008 | 0. 000 000 001 |
| | 14 | | + 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 6.5 | 0 | - 0. 000 612 207 | + 0. 002 704 540 | 0. 037 470 534 |
| | 1 | + 0. 000 644 213 | - 0. 001 416 112 | 0. 039 086 936 |
| | 2 | - 0. 000 648 747 | - 0. 002 467 302 | 0. 033 628 720 |
| | 3 | + 0. 000 349 203 | + 0. 007 157 509 | 0. 031 451 658 |
| | 4 | + 0. 000 417 295 | - 0. 005 914 368 | 0. 025 051 425 |
| | 5 | - 0. 000 691 662 | - 0. 004 340 619 | 0. 013 007 284 |
| | 6 | - 0. 000 773 777 | + 0. 001 971 914 | 0. 004 434 778 |
| | 7 | - 0. 000 351 363 | + 0. 002 394 328 | 0. 001 056 606 |
| | 8 | - 0. 000 096 818 | + 0. 000 975 659 | 0. 000 177 790 |
| | 9 | - 0. 000 018 548 | + 0. 000 239 573 | 0. 000 025 174 |
| | 10 | - 0. 000 002 654 | + 0. 000 041 210 | 0. 000 002 713 |
| | 11 | - 0. 000 000 296 | + 0. 000 005 342 | 0. 000 000 239 |
| | 12 | - 0. 000 000 026 | + 0. 000 000 545 | 0. 000 000 018 |
| | 13 | - 0. 000 000 002 | + 0. 000 000 045 | 0. 000 000 001 |
| | 14 | - 0. 000 000 000 | + 0. 000 000 003 | 0. 000 000 001 |
| | 15 | | + 0. 000 000 000 | 0. 000 000 000 |
| 7.0 | 0 | - 0. 000 436 411 | - 0. 004 763 398 | 0. 035 028 603 |
| | 1 | + 0. 000 387 805 | + 0. 005 539 010 | 0. 035 957 429 |
| | 2 | - 0. 000 194 501 | - 0. 007 092 625 | 0. 032 539 019 |
| | 3 | - 0. 000 207 061 | + 0. 006 628 260 | 0. 028 916 343 |
| | 4 | + 0. 000 591 768 | - 0. 000 651 745 | 0. 025 832 390 |
| | 5 | - 0. 000 216 853 | - 0. 006 250 938 | 0. 016 456 859 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| 7.0 | 6 | - 0. 000 728 189 | - 0. 000 318 796 | 0. 006 925 464 |
| | 7 | - 0. 000 473 258 | + 0. 002 431 449 | 0. 002 016 195 |
| | 8 | - 0. 000 168 706 | + 0. 001 494 869 | 0. 000 428 961 |
| | 9 | - 0. 000 040 225 | + 0. 000 480 366 | 0. 000 069 694 |
| | 10 | - 0. 000 007 022 | + 0. 000 103 256 | 0. 000 008 960 |
| | 11 | - 0. 000 000 946 | + 0. 000 016 359 | 0. 000 000 936 |
| | 12 | - 0. 000 000 102 | + 0. 000 002 016 | 0. 000 000 081 |
| | 13 | - 0. 000 000 009 | + 0. 000 000 200 | 0. 000 000 006 |
| | 14 | 0. 000 000 000 | + 0. 000 000 016 | 0. 000 000 002 |
| | 15 | | + 0. 000 000 001 | 0. 000 000 001 |
| | 16 | | + 0. 000 000 000 | 0. 000 000 000 |
| 7.5 | 0 | + 0. 000 031 609 | - 0. 006 836 801 | 0. 033 545 414 |
| | 1 | - 0. 000 092 381 | + 0. 006 652 038 | 0. 032 704 805 |
| | 2 | + 0. 000 264 842 | - 0. 005 407 906 | 0. 031 661 080 |
| | 3 | - 0. 000 458 110 | + 0. 001 599 874 | 0. 027 096 554 |
| | 4 | + 0. 000 386 630 | + 0. 004 241 831 | 0. 025 104 079 |
| | 5 | + 0. 000 200 159 | - 0. 005 333 278 | 0. 019 007 421 |
| | 6 | - 0. 000 525 924 | - 0. 002 979 406 | 0. 009 776 753 |
| | 7 | - 0. 000 547 644 | + 0. 001 623 475 | 0. 003 457 664 |
| | 8 | - 0. 000 258 161 | + 0. 001 912 958 | 0. 000 884 576 |
| | 9 | - 0. 000 076 946 | + 0. 000 832 589 | 0. 000 171 387 |
| | 10 | - 0. 000 016 356 | + 0. 000 225 328 | 0. 000 026 076 |

| | IV | V | VI |
|---|---|---|---|
| | $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | $r_n(X_F)$ |
| $X_F$ n | | | |
| 11 | - 0. 000 002 645 | + 0. 000 043 597 | 0. 000 003 205 |
| 12 | - 0. 000 000 339 | + 0. 000 006 455 | 0. 000 000 326 |
| 13 | - 0. 000 000 035 | + 0. 000 000 762 | 0. 000 000 028 |
| 7.5 14 | - 0. 000 000 003 | 0. 000 000 074 | 0. 000 000 003 |
| 15 | - 0. 000 000 000 | 0. 000 000 006 | 0. 000 000 001 |
| 16 | | 0. 000 000 000 | 0. 000 000 000 |
| 0 | + 0. 000 341 599 | - 0. 002 824 911 | 0. 032 053 108 |
| 1 | - 0. 000 363 669 | + 0. 002 097 572 | 0. 030 149 176 |
| 2 | + 0. 000 395 784 | + 0. 000 212 902 | 0. 030 256 093 |
| 3 | - 0. 000 325 626 | - 0. 003 749 798 | 0. 026 212 592 |
| 4 | + 0. 000 013 713 | + 0. 005 813 262 | 0. 023 677 701 |
| 8.0 5 | + 0. 000 402 745 | - 0. 001 895 512 | 0. 020 293 180 |
| 6 | - 0. 000 219 531 | - 0. 004 766 322 | 0. 012 576 583 |
| 7 | - 0. 000 532 102 | - 0. 000 048 727 | 0. 005 372 880 |
| 8 | - 0. 000 346 588 | + 0. 001 952 746 | 0. 001 645 180 |
| 9 | - 0. 000 130 562 | + 0. 001 242 537 | 0. 000 378 008 |
| 10 | - 0. 000 033 845 | + 0. 000 430 685 | 0. 000 067 699 |
| 11 | - 0. 000 006 550 | + 0. 000 102 118 | 0. 000 009 738 |
| 12 | - 0. 000 000 993 | + 0. 000 018 134 | 0. 000 001 153 |
| 13 | - 0. 000 000 122 | + 0. 000 002 537 | 0. 000 000 115 |
| 14 | - 0. 000 000 012 | + 0. 000 000 289 | 0. 000 000 010 |
| 15 | - 0. 000 000 001 | + 0. 000 000 027 | 0. 000 000 001 |
| 16 | 0. 000 000 000 | + 0. 000 000 002 | |
| 17 | | + 0. 000 000 000 | |

| | IV | V | VI |
|---|---|---|---|
| | $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | $r_n(X_F)$ |
| $X_F$ n | | | |
| 0 | + 0. 000 293 865 | + 0. 002 872 602 | 0. 030 099 110 |
| 1 | - 0. 000 273 985 | - 0. 003 420 574 | 0. 028 552 166 |
| 2 | + 0. 000 191 593 | + 0. 004 734 921 | 0. 028 295 097 |
| 3 | - 0. 000 001 237 | - 0. 005 508 723 | 0. 025 822 988 |
| 4 | - 0. 000 265 980 | + 0. 003 388 303 | 0. 022 373 912 |
| 5 | + 0. 000 344 486 | + 0. 002 184 409 | 0. 020 371 209 |
| 6 | + 0. 000 084 039 | - 0. 004 620 802 | 0. 014 861 358 |
| 8.5 7 | - 0. 000 409 024 | - 0. 002 114 008 | 0. 007 616 281 |
| 8 | - 0. 000 404 852 | + 0. 001 362 703 | 0. 002 780 475 |
| 9 | - 0. 000 196 904 | + 0. 001 570 651 | 0. 000 754 638 |
| 10 | - 0. 000 062 604 | + 0. 000 721 547 | 0. 000 158 365 |
| 11 | - 0. 000 014 499 | + 0. 000 211 576 | 0. 000 026 523 |
| 12 | - 0. 000 002 594 | + 0. 000 045 118 | 0. 000 003 636 |
| 13 | - 0. 000 000 372 | + 0. 000 007 459 | 0. 000 000 416 |
| 14 | - 0. 000 000 044 | + 0. 000 000 994 | 0. 000 000 041 |
| 15 | - 0. 000 000 004 | + 0. 000 000 109 | 0. 000 000 004 |
| 16 | - 0. 000 000 000 | + 0. 000 000 010 | 0. 000 000 001 |
| 17 | | 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | + 0. 000 020 610 | + 0. 005 222 080 | 0. 027 904 243 |
| | 1 | + 0. 000 011 624 | - 0. 005 198 831 | 0. 027 542 889 |
| | 2 | - 0. 000 107 468 | + 0. 004 745 709 | 0. 026 272 837 |
| | 3 | + 0. 000 240 673 | - 0. 002 871 796 | 0. 025 302 414 |
| | 4 | - 0. 000 302 366 | - 0. 000 991 173 | 0. 021 633 358 |
| | 5 | + 0. 000 112 916 | + 0. 004 539 266 | 0. 019 680 491 |
| | 6 | + 0. 000 271 977 | - 0. 002 404 702 | 0. 016 289 958 |
| | 7 | - 0. 000 203 043 | - 0. 003 701 627 | 0. 009 909 345 |
| | 8 | - 0. 000 402 904 | + 0. 000 097 764 | 0. 004 296 394 |
| 9.0 | 9 | - 0. 000 263 317 | + 0. 001 608 984 | 0. 001 373 166 |
| | 10 | - 0. 000 103 867 | + 0. 001 053 390 | 0. 000 336 485 |
| | 11 | - 0. 000 028 867 | + 0. 000 388 868 | 0. 000 065 351 |
| | 12 | - 0. 000 006 089 | + 0. 000 100 075 | 0. 000 010 330 |
| | 13 | - 0. 000 001 019 | + 0. 000 019 554 | 0. 000 001 359 |
| | 14 | - 0. 000 000 139 | + 0. 000 003 043 | 0. 000 000 152 |
| | 15 | - 0. 000 000 016 | + 0. 000 000 389 | 0. 000 000 015 |
| | 16 | - 0. 000 000 001 | + 0. 000 000 041 | 0. 000 000 002 |
| | 17 | 0. 000 000 000 | + 0. 000 000 003 | 0. 000 000 000 |
| | 18 | | + 0. 000 000 000 | |

| | IV | V | VI |
|---|---|---|---|
| | $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | $r_n(X_F)$ |
| $X_F$ n | | | |
| 0 | - 0. 000 203 087 | + 0. 002 781 616 | 0. 025 983 416 |
| 1 | + 0. 000 218 498 | - 0. 002 344 619 | 0. 026 537 150 |
| 2 | - 0. 000 250 204 | + 0. 000 907 806 | 0. 024 703 376 |
| 3 | + 0. 000 247 599 | + 0. 001 579 610 | 0. 024 313 262 |
| 4 | - 0. 000 128 727 | - 0. 004 095 030 | 0. 021 391 547 |
| 5 | - 0. 000 126 805 | + 0. 003 856 799 | 0. 018 811 990 |
| 6 | + 0. 000 284 568 | + 0. 000 826 070 | 0. 016 786 355 |
| 7 | + 0. 000 020 869 | - 0. 003 948 711 | 0. 011 908 921 |
| 8 | - 0. 000 324 736 | - 0. 001 539 256 | 0. 006 101 312 |
| 9 | - 0. 000 309 588 | + 0. 001 162 447 | 0. 002 290 440 |
| 9.5 10 | - 0. 000 154 637 | + 0. 001 317 399 | 0. 000 653 633 |
| 11 | - 0. 000 051 913 | + 0. 000 633 263 | 0. 000 146 740 |
| 12 | - 0. 000 012 923 | + 0. 000 198 665 | 0. 000 026 654 |
| 13 | - 0. 000 002 519 | + 0. 000 045 995 | 0. 000 004 007 |
| 14 | - 0. 000 000 398 | + 0. 000 008 349 | 0. 000 000 508 |
| 15 | - 0. 000 000 052 | + 0. 000 001 233 | 0. 000 000 056 |
| 16 | - 0. 000 000 005 | + 0. 000 000 152 | 0. 000 000 007 |
| 17 | - 0. 000 000 000 | + 0. 000 000 015 | 0. 000 000 001 |
| 18 | | + 0. 000 000 001 | 0. 000 000 000 |
| 19 | | 0. 000 000 000 | |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | - 0 000 208 780 | - 0. 001 670 828 | - 0. 024 646 010 |
| | 1 | + 0. 000 200 426 | + 0. 002 071 681 | 0. 025 216 537 |
| | 2 | - 0. 000 163 338 | - 0. 003 125 889 | 0. 023 721 298 |
| | 3 | + 0. 000 068 857 | + 0. 004 192 389 | 0. 022 971 506 |
| | 4 | + 0. 000 092 336 | - 0. 003 866 845 | 0. 021 260 770 |
| | 5 | - 0. 000 233 103 | + 0. 000 797 124 | 0. 018 217 033 |
| | 6 | + 0. 000 148 738 | + 0. 003 318 766 | 0. 016 568 938 |
| | 7 | + 0. 000 182 997 | - 0. 002 541 662 | 0. 013 323 112 |
| | 8 | - 0. 000 181 474 | - 0. 002 923 898 | 0. 008 001 335 |
| | 9 | - 0. 000 313 862 | + 0. 000 177 973 | 0. 003 518 570 |
| 10.0 | 10 | - 0. 000 205 934 | + 0. 001 352 853 | 0. 001 167 021 |
| | 11 | - 0. 000 084 478 | + 0. 000 907 311 | 0. 000 302 128 |
| | 12 | - 0. 000 024 911 | + 0. 000 353 344 | 0. 000 062 875 |
| | 13 | - 0. 000 005 654 | + 0. 000 097 505 | 0. 000 010 773 |
| | 14 | - 0. 000 001 030 | + 0. 000 020 672 | 0. 000 001 550 |
| | 15 | - 0. 000 000 155 | + 0. 000 003 523 | 0. 000 000 190 |
| | 16 | - 0. 000 000 019 | + 0. 000 000 497 | 0. 000 000 021 |
| | 17 | - 0. 000 000 002 | + 0. 000 000 059 | 0. 000 000 002 |
| | 18 | 0. 000 000 000 | + 0. 000 000 006 | 0. 000 000 001 |
| | 19 | | + 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | - 0. 000 041 472 | - 0. 004 074 292 | 0. 023 780 906 |
| | 1 | + 0. 000 022 995 | + 0. 004 120 282 | 0. 023 694 337 |
| | 2 | + 0. 000 033 688 | - 0. 004 031 519 | 0. 023 066 711 |
| | 3 | - 0. 000 122 050 | + 0. 003 164 460 | 0. 021 661 321 |
| | 4 | + 0. 000 199 261 | - 0. 000 838 068 | 0. 020 865 453 |
| | 5 | - 0. 000 168 403 | - 0. 002 440 068 | 0. 018 020 389 |
| | 6 | - 0. 000 037 334 | + 0. 003 676 093 | 0. 016 039 996 |
| | 7 | + 0. 000 227 651 | - 0. 000 040 955 | 0. 014 025 358 |
| | 8 | - 0. 000 013 626 | - 0. 003 364 198 | 0. 009 739 469 |
| | 9 | - 0. 000 262 553 | - 0. 001 143 746 | 0. 004 998 405 |
| 10.5 | | | | |
| | 10 | - 0. 000 243 226 | + 0. 001 005 183 | 0. 001 923 556 |
| | 11 | - 0. 000 124 330 | + 0. 001 124 080 | 0. 000 573 266 |
| | 12 | - 0. 000 043 730 | + 0. 000 561 665 | 0. 000 136 382 |
| | 13 | - 0. 000 011 582 | + 0. 000 186 710 | 0. 000 026 562 |
| | 14 | - 0. 000 002 430 | + 0. 000 046 392 | 0. 000 004 322 |
| | 15 | - 0. 000 000 417 | + 0. 000 009 127 | 0. 000 000 598 |
| | 16 | - 0. 000 000 060 | + 0. 000 001 473 | 0. 000 000. 072 |
| | 17 | - 0. 000 000 007 | + 0. 000 000 199 | 0. 000 000 008 |
| | 18 | - 0. 000 000 000 | + 0. 000 000 023 | 0. 000 000 002 |
| | 19 | | + 0. 000 000 002 | 0. 000 000 000 |
| | 20 | | 0. 000 000 000 | |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | + 0. 000 124 639 | - 0. 002 663 131 | 0. 023 023 101 |
| | 1 | - 0. 000 135 644 | + 0. 002 391 842 | 0. 022 313 724 |
| | 2 | + 0. 000 161 932 | - 0. 001 472 823 | 0. 022 355 907 |
| | 3 | - 0. 000 178 979 | - 0. 000 248 785 | 0. 020 698 934 |
| | 4 | + 0. 000 140 720 | + 0. 002 448 432 | 0. 020 097 372 |
| | 5 | - 0. 000 007 796 | - 0. 003 652 161 | 0. 018 037 351 |
| | 6 | - 0. 000 161 754 | + 0. 001 789 064 | 0. 015 588 842 |
| | 7 | + 0. 000 153 589 | + 0. 002 302 253 | 0. 014 106 829 |
| | 8 | + 0. 000 122 392 | - 0. 002 494 236 | 0. 011 073 580 |
| | 9 | - 0. 000 160 042 | - 0. 002 344 801 | 0. 006 591 485 |
| 11.0 | 10 | - 0. 000 250 229 | + 0. 000 220 979 | 0. 002 937 733 |
| | 11 | - 0. 000 164 876 | + 0. 001 156 311 | 0. 001 006 573 |
| | 12 | - 0. 000 069 968 | + 0. 000 791 739 | 0. 000 273 318 |
| | 13 | - 0. 000 021 715 | + 0. 000 322 894 | 0. 000 060 386 |
| | 14 | - 0. 000 005 252 | + 0. 000 094 646 | 0. 000 011 093 |
| | 15 | - 0. 000 001 029 | + 0. 000 021 536 | 0. 000 001 725 |
| | 16 | - 0. 000 000 167 | + 0. 000 003 972 | 0. 000 000 231 |
| | 17 | - 0. 000 000 023 | + 0. 000 000 611 | 0. 000 000 028 |
| | 18 | - 0. 000 000 002 | + 0. 000 000 080 | 0. 000 000 004 |
| | 19 | - 0. 000 000 000 | + 0. 000 000 009 | 0. 000 000 001 |
| | 20 | | + 0. 000 000 000 | 0. 000 000 000 |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F))$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | + 0. 000 153 509 | + 0. 000 859 115 | 0. 022 086 660 |
| | 1 | - 0. 000 150 261 | - 0. 001 159 638 | 0. 021 313 575 |
| | 2 | + 0. 000 133 699 | + 0. 001 994 959 | 0. 021 398 493 |
| | 3 | - 0. 000 085 878 | - 0. 003 045 028 | 0. 020 113 897 |
| | 4 | - 0. 000 008 345 | + 0. 003 493 537 | 0. 019 139 890 |
| | 5 | + 0. 000 124 946 | - 0. 002 177 314 | 0. 017 963 895 |
| | 6 | - 0. 000 163 533 | - 0. 001 034 551 | 0. 015 415 935 |
| | 7 | + 0. 000 016 235 | + 0. 003 224 248 | 0. 013 831 909 |
| | 8 | + 0. 000 179 504 | - 0. 000 579 472 | 0. 011 864 318 |
| | 9 | - 0. 000 032 154 | - 0. 002 811 370 | 0. 008 102 589 |
| 11.5 | 10 | - 0. 000 215 682 | - 0. 000 863 503 | 0. 004 170 710 |
| | 11 | - 0. 000 195 357 | + 0. 000 879 275 | 0. 001 641 199 |
| | 12 | - 0. 000 101 911 | + 0. 000 972 722 | 0. 000 508 069 |
| | 13 | - 0. 000 037 328 | + 0. 000 502 626 | 0. 000 127 144 |
| | 14 | - 0. 000 010 435 | + 0. 000 175 717 | 0. 000 026 315 |
| | 15 | - 0. 000 002 334 | + 0. 000 046 435 | 0. 000 004 590 |
| | 16 | - 0. 000 000 431 | + 0. 000 009 800 | 0. 000 000 685 |
| | 17 | - 0. 000 000 067 | + 0. 000 001 709 | 0. 000 000 089 |
| | 18 | - 0. 000 000 008 | + 0. 000 000 252 | 0. 000 000 012 |
| | 19 | - 0. 000 000 001 | + 0. 000 000 031 | 0. 000 000 001 |
| | 20 | 0. 000 000 000 | + 0. 000 000 003 | 0. 000 000 000 |
| | 21 | | 0. 000 000 000 | |

| $X_F$ | n | IV $-\frac{1}{8X_F^2} J_{2n}(2X_F)$ | V $\frac{1}{8X_F}(J_{2n-1}(2X_F) - J_{2n+1}(2X_F)$ | VI $r_n(X_F)$ |
|---|---|---|---|---|
| | 0 | + 0. 000 048 811 | + 0. 003 209 126 | 0. 020 966 886 |
| | 1 | - 0. 000 037 668 | - 0. 003 284 462 | 0. 020 648 877 |
| | 2 | + 0. 000 002 670 | + 0. 003 370 480 | 0. 020 297 538 |
| | 3 | + 0. 000 056 030 | - 0. 003 044 978 | 0. 019 683 493 |
| | 4 | - 0. 000 121 869 | + 0. 001 733 842 | 0. 018 285 935 |
| | 5 | + 0. 000 145 584 | + 0. 000 696 956 | 0. 017 603 309 |
| | 6 | - 0. 000 063 359 | - 0. 002 913 114 | 0. 015 474 906 |
| | 7 | - 0. 000 102 455 | + 0. 002 239 057 | 0. 013 512 472 |
| | 8 | + 0. 000 144 365 | + 0. 001 505 165 | 0. 012 130 816 |
| | 9 | + 0. 000 080 826 | - 0. 002 360 146 | 0. 009 333 019 |
| | 10 | - 0. 000 140 549 | - 0. 001 905 709 | 0. 005 521 423 |
| 12 | 11 | - 0. 000 203 376 | + 0. 000 242 413 | 0. 002 492 177 |
| | 12 | - 0. 000 134 585 | + 0. 001 001 821 | 0. 000 878 919 |
| | 13 | - 0. 000 058 837 | + 0. 000 698 401 | 0. 000 248 873 |
| | 14 | - 0. 000 019 097 | + 0. 000 296 573 | 0. 000 057 948 |
| | 15 | - 0. 000 004 883 | + 0. 000 091 652 | 0. 000 011 317 |
| | 16 | - 0. 000 001 020 | + 0. 000 022 191 | 0. 000 001 885 |
| | 17 | - 0. 000 000 178 | + 0. 000 004 387 | 0. 000 000 272 |
| | 18 | - 0. 000 000 026 | + 0. 000 000 728 | 0. 000 000 035 |
| | 19 | - 0. 000 000 003 | + 0. 000 000 103 | 0. 000 000 005 |
| | 20 | - 0. 000 000 000 | + 0. 000 000 012 | 0. 000 000 001 |
| | 21 | | + 0. 000 000 001 | 0. 000 000 000 |
| | 22 | | + 0. 000 000 000 | |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| 0.5 | 0 | 1 | 0. 317 106 269 | 1 | 0. 317 106 269 |
| | 1 | 37 | 0. 000 217 319 | 197 | 0. 000 040 816 |
| | 2 | 145 | 0. 000 000 499 | 785 | 0. 000 000 092 |
| | 3 | 325 | 0. 000 000 001 | 1765 | 0. 000 000 000 |
| | 4 | 577 | 0. 000 000 000 | | |
| 1.0 | 0 | 1 | 0. 273 385 667 | 1 | 0. 273 385 667 |
| | 1 | 10 | 0. 002 888 848 | 50 | 0. 000 577 769 |
| | 2 | 37 | 0. 000 028 783 | 197 | 0. 000 005 406 |
| | 3 | 82 | 0. 000 000 245 | 442 | 0. 000 000 045 |
| | 4 | 145 | 0. 000 000 001 | 785 | 0. 000 000 000 |
| | 5 | 226 | 0. 000 000 000 | 1226 | |
| 1.5 | 0 | 1 | 0. 214 894 401 | 1 | 0. 214 894 401 |
| | 1 | 45/9 | 0. 010 864 463 | 205/9 | 0. 002 384 882 |
| | 2 | 153/9 | 0. 000 275 717 | 793/9 | 0. 000 053 196 |
| | 3 | 333/9 | 0. 000 005 526 | 1773/9 | 0. 000 001 037 |
| | 4 | 585/9 | 0. 000 000 083 | 3145/9 | 0. 000 000 015 |
| | 5 | 909/9 | 0. 000 000 001 | 4909/9 | 0. 000 000 000 |
| | 6 | 1305/9 | 0. 000 000 000 | | |
| 2.0 | 0 | 1.00 | 0. 156 763 851 | 1 | 0. 156 763 851 |
| | 1 | 3.25 | 0. 023 106 825 | 53/4 | 0. 005 667 712 |
| | 2 | 10.00 | 0. 003 300 735 | 50 | 0. 000 660 147 |
| | 3 | 21.25 | 0. 000 046 010 | 445/4 | 0. 000 008 788 |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| 2.0 | 4 | 37.00 | 0. 000 001 271 | 197 | 0. 000 000 238 |
| | 5 | 57.25 | 0. 000 000 026 | 1229/4 | 0. 000 000 004 |
| | 6 | 82.00 | 0. 000 000 000 | 442 | 0. 000 000 000 |
| 2.5 | 0 | 1 | 0. 110 702 286 | 1 | 0. 110 702 286 |
| | 1 | 61/25 | 0. 034 856 375 | 221/25 | 0. 009 620 990 |
| | 2 | 169/25 | 0. 003 401 211 | 809/25 | 0. 000 710 512 |
| | 3 | 349/25 | 0. 000 216 774 | 1789/25 | 0. 000 042 288 |
| | 4 | 601/25 | 0. 000 009 778 | 3161/25 | 0. 000 001 859 |
| | 5 | 925/25 | 0. 000 000 326 | 4925/25 | 0. 000 000 061 |
| | 6 | 1321/25 | 0. 000 000 008 | 7081/25 | 0. 000 000 001 |
| | 7 | 1789/25 | 0. 000 000 000 | 9629/25 | 0. 000 000 000 |
| 3.0 | 0 | 1.00 | 0. 081 451 231 | 1 | 0. 081 451 231 |
| | 1 | 2.00 | 0. 041 640 663 | 58/9 | 0. 012 922 964 |
| | 2 | 5.00 | 0. 006 959 958 | 205/9 | 0. 001 527 795 |
| | 3 | 10.00 | 0. 000 698 116 | 50 | 0. 000 139 623 |
| | 4 | 17.00 | 0. 000 047 843 | 793/9 | 0. 000 009 230 |
| | 5 | 26.00 | 0. 000 002 382 | 1234/9 | 0. 000 000 451 |
| | 6 | 37.00 | 0. 000 000 055 | 197 | 0. 000 000 010 |
| | 7 | 50.00 | 0. 000 000 002 | 2410/9 | 0. 000 000 000 |
| | 8 | 65.00 | 0. 000 000 000 | 3145/9 | |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| | 0 | 1 | 0. 066 852 651 | 1 | 0. 066 852 651 |
| | 1 | 85/49 | 0. 042 390 399 | 245/49 | 0. 014 706 873 |
| | 2 | 193/49 | 0. 011 264 553 | 833/49 | 0. 002 609 914 |
| | 3 | 373/49 | 0. 001 699 124 | 1813/49 | 0. 000 349 571 |
| | 4 | 625/49 | 0. 000 168 828 | 3187/49 | 0. 000 033 129 |
| 3.5 | 5 | 949/49 | 0. 000 011 949 | 4949/49 | 0. 000 002 291 |
| | 6 | 1345/49 | 0. 000 000 634 | 7105/49 | 0. 000 000 120 |
| | 7 | 1813/49 | 0. 000 000 026 | 9653/49 | 0. 000 000 004 |
| | 8 | 2353/49 | 0. 000 000 000 | 12593/49 | 0. 000 000 000 |
| | 0 | 1. 00 00 | 0. 060 848 254 | 1 | 0. 060 848 254 |
| | 1 | 1. 56 25 | 0. 039 349 029 | 65/16 | 0. 015 134 242 |
| | 2 | 3. 25 00 | 0. 015 157 759 | 53/4 | 0. 003 717 940 |
| | 3 | 6. 06 25 | 0. 003 318 108 | 457/16 | 0. 000 704 281 |
| | 4 | 10. 00 00 | 0. 000 462 885 | 50 | 0. 000 092 577 |
| 4.0 | 5 | 15. 06 25 | 0. 000 045 002 | 1241/16 | 0. 000 008 739 |
| | 6 | 21. 25 00 | 0. 000 003 236 | 445/4 | 0. 000 000 618 |
| | 7 | 28. 56 25 | 0. 000 000 179 | 2417/16 | 0. 000 000 033 |
| | 8 | 37. 00 00 | 0. 000 000 007 | 197 | 0. 000 000 001 |
| | 9 | 46. 56 25 | 0. 000 000 000 | 3985/16 | 0. 000 000 000 |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Co. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| 4.5 | 0 | 1 | 0. 057 358 432 | 1 | 0. 057 358 432 |
| | 1 | 117/81 | 0. 035 787 046 | 277/81 | 0. 015 115 828 |
| | 2 | 225/81 | 0. 017 640 076 | 865/81 | 0. 004 588 459 |
| | 3 | 405/81 | 0. 005 406 734 | 1845/81 | 0. 001 186 844 |
| | 4 | 657/81 | 0. 001 034 157 | 3217/81 | 0. 000 211 203 |
| | 5 | 981/81 | 0. 000 134 798 | 4981/81 | 0. 000 026 548 |
| | 6 | 1377/81 | 0. 000 012 801 | 7137/81 | 0. 000 002 469 |
| | 7 | 1845/81 | 0. 000 000 092 | 9685/81 | 0. 000 000 017 |
| | 8 | 2385/81 | 0. 000 000 053 | 12625/81 | 0. 000 000 010 |
| | 9 | 2997/81 | 0. 000 000 002 | 15957/81 | 0. 000 000 000 |
| | 10 | 3681/81 | 0. 000 000 000 | | |
| | 0 | 1. 00 | 0. 052 940 111 | 1 | 0. 052 940 111 |
| | 1 | 1. 36 | 0. 033 740 716 | 2.96 | 0. 015 502 491 |
| | 2 | 2. 44 | 0. 018 483 436 | 8.84 | 0. 005 101 762 |
| | 3 | 4. 24 | 0. 007 564 731 | 18.64 | 0. 001 720 732 |
| | 4 | 6. 76 | 0. 001 944 565 | 32.36 | 0. 000 406 219 |
| 5.0 | 5 | 10. 00 | 0. 000 333 819 | 50 | 0. 000 066 763 |
| | 6 | 13. 96 | 0. 000 041 073 | 71.56 | 0. 000 008 012 |
| | 7 | 18. 64 | 0. 000 003 816 | 97.04 | 0. 000 000 733 |
| | 8 | 24. 04 | 0. 000 000 278 | 126.44 | 0. 000 000 052 |
| | 9 | 30. 16 | 0. 000 000 016 | 159.76 | 0. 000 000 003 |
| | 10 | 37. 00 | 0. 000 000 000 | 197.00 | 0. 000 000 000 |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| | 0 | 1 | 0. 047 231 244 | 1 | 0. 047 231 244 |
| | 1 | 157/121 | 0. 033 247 831 | 317/121 | 0. 016 466 591 |
| | 2 | 265/121 | 0. 018 290 850 | 905/121 | 0. 005 355 884 |
| | 3 | 445/121 | 0. 009 315 674 | 1885/121 | 0. 002 199 191 |
| | 4 | 697/121 | 0. 003 150 117 | 3257/121 | 0. 000 674 127 |
| 5.5 | 5 | 1021/121 | 0. 000 702 381 | 5021/121 | 0. 000 142 826 |
| | 6 | 1417/121 | 0. 000 110 391 | 7177/121 | 0. 000 021 795 |
| | 7 | 1885/121 | 0. 000 012 937 | 9725/121 | 0. 000 002 507 |
| | 8 | 2425/121 | 0. 000 001 178 | 12665/121 | 0. 000 000 225 |
| | 9 | 3037/121 | 0. 000 000 086 | 15997/121 | 0. 000 000 016 |
| | 10 | 3721/121 | 0. 000 000 005 | 19721/121 | 0. 000 000 000 |
| | 11 | 4477/121 | 0. 000 000 000 | 23837/121 | |
| | 0 | 1. 00 | 0. 041 623 793 | 1 | 0. 041 623 793 |
| | 1 | 1. 25 | 0. 033 112 135 | 2.361111... | 0. 017 529 953 |
| | 2 | 2. 00 | 0. 017 985 469 | 6.4444... | 0. 005 581 697 |
| | 3 | 3. 25 | 0. 010 368 648 | 13.24999... | 0. 002 543 253 |
| 6.0 | 4 | 5. 00 | 0. 004 478 397 | 22.777... | 0. 000 983 062 |
| | 5 | 7. 25 | 0. 001 280 985 | 35.0277... | 0. 000 265 136 |
| | 6 | 10. 00 | 0. 000 254 406 | 50 | 0. 000 050 881 |
| | 7 | 13. 25 | 0. 000 037 173 | 67.69444... | 0. 000 007 276 |
| | 8 | 17. 00 | 0. 000 004 180 | 88.11111... | 0. 000 000 806 |

| | VII | VII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ | n | | | |
| 6.0 | 9 | 21. 25 | 0. 000 000 374 | 111.2499... | 0. 000 000 071 |
| | 10 | 26. 00 | 0. 000 000 029 | 137.11111... | 0. 000 000 005 |
| | 11 | 31. 25 | 0. 000 000 001 | 165.6944... | 0. 000 000 000 |
| | 12 | 37. 00 | 0. 000 000 000 | 197 | |
| 6.5 | 0 | 1 | 0. 037 470 534 | 1 | 0. 037 470 534 |
| | 1 | 205/169 | 0. 032 222 888 | 365/169 | 0. 018 097 786 |
| | 2 | 313/169 | 0. 018 157 360 | 953/169 | 0. 005 963 540 |
| | 3 | 493/169 | 0. 010 781 602 | 1933/169 | 0. 002 749 782 |
| | 4 | 745/169 | 0. 005 682 806 | 3305/169 | 0. 001 280 996 |
| | 5 | 1069/169 | 0. 002 056 343 | 5069/169 | 0. 000 433 661 |
| | 6 | 1465/169 | 0. 000 511 588 | 7225/169 | 0. 000 103 733 |
| | 7 | 1933/169 | 0. 000 092 377 | 9773/169 | 0. 000 018 271 |
| | 8 | 2473/169 | 0. 000 012 149 | 12713/169 | 0. 000 002 363 |
| | 9 | 3085/169 | 0. 000 001 379 | 16045/169 | 0. 000 000 265 |
| | 10 | 3769/169 | 0. 000 000 121 | 19769/169 | 0. 000 000 023 |
| | 11 | 4525/169 | 0. 000 000 008 | 23885/169 | 0. 000 000 001 |
| | 12 | 5353/169 | 0. 000 000 000 | 28393/169 | 0. 000 000 000 |
| 7.0 | 0 | 1 | 0. 035 028 603 | 1 | 0. 035 028 603 |
| | 1 | 58/49 | 0. 030 377 827 | 2 | 0. 017 978 714 |
| | 2 | 85/49 | 0. 018 757 787 | 5 | 0. 006 507 803 |
| | 3 | 130/49 | 0. 010 899 236 | 10 | 0. 002 891 634 |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| 7.0 | 4 | 193/49 | 0. 006 558 482 | 17 | 0. 001 519 552 |
| | 5 | 274/49 | 0. 002 943 014 | 26 | 0. 000 632 956 |
| | 6 | 373/49 | 0. 000 909 779 | 37 | 0. 000 187 174 |
| | 7 | 10 | 0. 000 201 619 | 50 | 0. 000 040 323 |
| | 8 | 625/49 | 0. 000 033 630 | 65 | 0. 000 006 599 |
| | 9 | 778/49 | 0. 000 004 389 | 82 | 0. 000 000 849 |
| | 10 | 949/49 | 0. 000 000 462 | 101 | 0. 000 000 088 |
| | 11 | 1138/49 | 0. 000 000 040 | 122 | 0. 000 000 007 |
| | 12 | 1345/49 | 0. 000 000 002 | 145 | 0. 000 000 000 |
| 7.5 | 0 | 1 | 0. 033 545 414 | 1 | 0. 033 545 414 |
| | 1 | 261/225 | 0. 028 193 797 | 421/225 | 0. 017 478 815 |
| | 2 | 369/225 | 0. 019 305 536 | 1009/225 | 0. 007 060 201 |
| | 3 | 549/225 | 0. 011 105 145 | 1988/225 | 0. 003 065 221 |
| | 4 | 801/225 | 0. 007 052 707 | 3361/225 | 0. 001 680 576 |
| | 5 | 1125/225 | 0. 003 801 484 | 5125/225 | 0. 000 834 472 |
| | 6 | 1521/225 | 0. 001 446 265 | 7281/225 | 0. 000 302 124 |
| | 7 | 1989/225 | 0. 000 391 138 | 9829/225 | 0. 000 079 150 |
| | 8 | 2529/225 | 0. 000 078 698 | 12769/225 | 0. 000 015 586 |
| | 9 | 3141/225 | 0. 000 012 277 | 16101/225 | 0. 000 002 395 |
| | 10 | 3825/225 | 0. 000 001 533 | 19825/225 | 0. 000 000 295 |

| | | VII | VIII | IX | X |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | | ql=3 | | ql=7 | |
| $X_F$ | n | | | | |
| | 11 | 4581/225 | 0. 000 000 157 | 23941/225 | 0. 000 000 030 |
| 7.5 | 12 | 5409/225 | 0. 000 000 013 | 28449/225 | 0. 000 000 002 |
| | 13 | 6309/225 | 0. 000 000 000 | 33349/225 | 0. 000 000 000 |
| | 0 | 1.000000 | 0. 032 053 108 | 1 | 0. 032 053 108 |
| | 1 | 1.140625 | 0. 026 432 154 | 113/64 | 0. 017 075 639 |
| | 2 | 1.562500 | 0. 019 363 899 | 65/16 | 0. 007 447 653 |
| | 3 | 2.265625 | 0. 011 569 695 | 505/64 | 0. 003 321 991 |
| | 4 | 3.250000 | 0. 007 285 446 | 53/4 | 0. 001 786 996 |
| | 5 | 4.515625 | 0. 004 493 991 | 1289/64 | 0. 001 007 574 |
| 8.0 | 6 | 6.062500 | 0. 002 074 487 | 457/16 | 0. 000 440 318 |
| | 7 | 8.656250 | 0. 000 620 693 | 2465/64 | 0. 000 139 498 |
| | 8 | 10.000000 | 0. 000 164 518 | 50 | 0. 000 032 903 |
| | 9 | 12.390625 | 0. 000 030 507 | 4033/64 | 0. 000 005 998 |
| | 10 | 15.062500 | 0. 000 004 494 | 1241/16 | 0. 000 000 872 |
| | 11 | 18.015625 | 0. 000 000 540 | 5993/64 | 0. 000 000 103 |
| | 12 | 21.250000 | 0. 000 000 054 | 445/4 | 0. 000 000 010 |
| | 13 | 24.765625 | 0. 000 000 004 | 8345/64 | 0. 000 000 000 |
| | 0 | 1 | 0. 030 099 110 | 1 | 0. 030 099 110 |
| | 1 | 325/289 | 0. 025 389 464 | 485/289 | 0. 017 013 558 |
| 8.5 | 2 | 433/289 | 0. 018 885 180 | 1073/289 | 0. 007 620 953 |
| | 3 | 613/289 | 0. 012 174 296 | 2053/289 | 0. 003 635 091 |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ | n | | | |
| | 4 865/289 | 0. 007 475 214 | 3425/289 | 0. 001 887 900 |
| | 5 1189/289 | 0. 004 951 454 | 5189/289 | 0. 001 134 569 |
| | 6 1585/289 | 0. 002 709 736 | 7345/289 | 0. 000 584 742 |
| | 7 2053/289 | 0. 001 072 140 | 9893/289 | 0. 000 222 491 |
| | 8 2593/289 | 0. 000 309 894 | 12833/289 | 0. 000 062 616 |
| | 9 3205/289 | 0. 000 068 046 | 16165/289 | 0. 000 013 491 |
| 8.5 | 10 3839/289 | 0. 000 011 768 | 19889/289 | 0. 000 002 301 |
| | 11 4645/289 | 0. 000 001 650 | 24005/289 | 0. 000 000 319 |
| | 12 5473/289 | 0. 000 000 191 | 28513/289 | 0. 000 000 036 |
| | 13 6373/289 | 0. 000 000 018 | 33413/289 | 0. 000 000 003 |
| | 14 7345/289 | 0. 000 000 001 | 38705/289 | 0. 000 000 000 |
| | 15 8389/289 | 0. 000 000 000 | | |
| | 0 1.000000 | 0. 027 904 243 | 1 | 0. 027 904 243 |
| | 1 1.111111 | 0. 024 788 600 | 130/81 | 0. 017 161 338 |
| | 2. 1.444444 | 0. 018 188 887 | 277/81 | 0. 007 682 670 |
| | 3 2.000000 | 0. 012 651 207 | 9/58 | 0. 003 926 236 |
| | 4 2.777771 | 0. 007 788 008 | 865/81 | 0. 002 025 782 |
| 9.0 | 5 3.777777 | 0. 005 209 541 | 1306/81 | 0. 001 220 612 |
| | 6 5.000000 | 0. 003 257 991 | 9/205 | 0. 000 715 168 |
| | 7 6.444444 | 0. 001 537 656 | 2482/81 | 0. 000 323 391 |
| | 8 8.111111 | 0. 000 529 692 | 3217/81 | 0. 000 108 177 |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ n | | | | |
| 9 | 10.00000 | 0. 000 137 316 | 50 | 0. 000 027 463 |
| 10 | 12.11111 | 0. 000 027 783 | 4981/81 | 0. 000 005 471 |
| 11 | 14.444444 | 0. 000 004 524 | 6010/81 | 0. 000 000 880 |
| 9.0 12 | 17.000000 | 0. 000 000 607 | 9/793 | 0. 000 000 117 |
| 13 | 19.77777 | 0. 000 000 068 | 8362/81 | 0. 000 000 013 |
| 14 | 22.77777 | 0. 000 000 006 | 9685/81 | 0. 000 000 001 |
| 0 | 1 | 0. 025 983 416 | 1 | 0. 025 983 416 |
| 1 | 397/361 | 0. 024 130 758 | 557/361 | 0. 017 199 122 |
| 2 | 505/361 | 0. 017 659 245 | 1145/361 | 0. 007 788 575 |
| 3 | 685/361 | 0. 012 813 266 | 2125/361 | 0. 004 130 394 |
| 4 | 937/361 | 0. 008 241 567 | 3497/361 | 0. 002 208 278 |
| 5 | 1261/361 | 0. 005 385 510 | 5261/361 | 0. 001 290 843 |
| 6 | 1657/361 | 0. 003 657 135 | 7417/361 | 0. 000 817 024 |
| 9.5 7 | 2125/361 | 0. 002 023 115 | 9965/361 | 0. 000 431 422 |
| 8 | 2665/361 | 0. 000 826 481 | 12905/361 | 0. 000 170 675 |
| 9 | 3277/361 | 0. 000 252 318 | 16237/361 | 0. 000 050 923 |
| 10 | 3961/361 | 0. 000 059 571 | 19961/361 | 0. 000 011 821 |
| 11 | 4717/361 | 0. 000 011 230 | 24077/361 | 0. 000 002 200 |
| 12 | 5545/361 | 0. 000 001 735 | 28585/361 | 0. 000 000 336 |
| 13 | 6445/361 | 0. 000 000 224 | 33485/361 | 0. 000 000 043 |

| VII | | VIII | IX | | X |
|---|---|---|---|---|---|
| $1+(ql)^2\frac{n^2}{X_F^2}$ | | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | | Col. VI/Col. IX |
| ql=3 | | | ql=7 | | |
| $X_F$ n | | | | | |
| 14 | 7417/361 | 0. 000 000 024 | 38777/361 | 0. 000 000 004 | |
| 9.5 15 | 8461/361 | 0. 000 000 002 | 44461/361 | 0. 000 000 000 | |
| 16 | 9577/361 | 0. 000 000 000 | 50537/361 | | |
| 0 | 1.00 | 0. 024 646 010 | 1.00 | 0. 024 646 010 | |
| 1 | 1.09 | 0. 023 134 437 | 1.49 | 0. 016 923 850 | |
| 2 | 1.36 | 0. 017 442 130 | 2.96 | 0. 008 013 952 | |
| 3 | 1.81 | 0. 012 691 439 | 5.41 | 0. 004 246 119 | |
| 4 | 2.44 | 0. 008 713 430 | 8.84 | 0. 002 405 064 | |
| 5 | 3.25 | 0. 005 605 240 | 13.25 | 0. 001 374 870 | |
| 6 | 4.24 | 0. 003 907 768 | 18.64 | 0. 000 888 891 | |
| 7 | 5.41 | 0. 002 462 682 | 25.01 | 0. 000 532 711 | |
| 8 | 6.76 | 0. 001 183 629 | 32.36 | 0. 000 247 260 | |
| 10.0 9 | 8.29 | 0. 000 424 435 | 40.69 | 0. 000 086 472 | |
| 10 | 10.00 | 0. 000 116 702 | 50.00 | 0. 000 023 340 | |
| 11 | 11.89 | 0. 000 025 410 | 60.29 | 0. 000 005 011 | |
| 12 | 13.96 | 0. 000 004 503 | 71.56 | 0. 000 000 878 | |
| 13 | 16.21 | 0. 000 000 664 | 83.81 | 0. 000 000 128 | |
| 14 | 18.64 | 0. 000 000 083 | 97.04 | 0. 000 000 015 | |
| 15 | 21.25 | 0. 000 000 008 | 111.25 | 0. 000 000 001 | |
| 16 | 24.04 | 0. 000 000 000 | 126.44 | 0. 000 000 000 | |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ n | | | | |
| 0 | 1 | 0. 023 780 906 | 1 | 0. 023 780 906 |
| 1 | 477/441 | 0. 021 906 085 | 637/441 | 0. 016 403 771 |
| 2 | 585/441 | 0. 017 388 751 | 1225/441 | 0. 008 304 015 |
| 3 | 765/441 | 0. 012 487 114 | 2205/441 | 0. 004 332 264 |
| 4 | 1017/441 | 0. 009 047 851 | 3577/441 | 0. 002 572 453 |
| 5 | 1341/441 | 0. 005 926 168 | 5341/441 | 0. 001 487 922 |
| 6 | 1737/441 | 0. 004 072 330 | 7497/441 | 0. 000 943 529 |
| 7 | 2205/441 | 0. 002 805 071 | 10045/441 | 0. 000 615 747 |
| 8 | 2745/441 | 0. 001 564 701 | 12985/441 | 0. 000 330 774 |
| 10.5 9 | 3357/441 | 0. 000 656 626 | 16317/441 | 0. 000 135 092 |
| 10 | 4041/441 | 0. 000 209 920 | 20041/441 | 0. 000 042 327 |
| 11 | 4797/441 | 0. 000 052 701 | 24157/441 | 0. 000 010 465 |
| 12 | 5625/441 | 0. 000 010 692 | 28665/441 | 0. 000 002 098 |
| 13 | 6525/441 | 0. 000 001 795 | 33505/441 | 0. 000 000 348 |
| 14 | 7497/441 | 0. 000 000 254 | 38857/441 | 0. 000 000 049 |
| 15 | 8541/441 | 0. 000 000 030 | 44541/441 | 0. 000 000 005 |
| 16 | 9657/441 | 0. 000 000 003 | 50617/441 | 0. 000 000 000 |
| 17 | | 0. 000 000 000 | | |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ | n | | | |
| | 0 | 1 | 0. 023 023 101 | 1 | 0. 023 023 101 |
| | 1 | 130/121 | 0. 020 768 927 | 170/121 | 0. 015 882 121 |
| | 2 | 157/121 | 0. 017 229 711 | 317/121 | 0. 008 533 327 |
| | 3 | 202/121 | 0. 012 398 866 | 562/121 | 0. 004 456 532 |
| | 4 | 265/121 | 0. 009 176 535 | 611/121 | 0. 002 687 051 |
| | 5 | 346/121 | 0. 006 307 859 | 1346/121 | 0. 001 621 485 |
| | 6 | 445/121 | 0. 004 238 763 | 1885/121 | 0. 001 000 663 |
| | 7 | 562/121 | 0. 003 037 235 | 2522/121 | 0. 000 676 814 |
| 11.0 | 8 | 697/121 | 0. 001 922 386 | 3257/121 | 0. 000 411 391 |
| | 9 | 850/121 | 0. 000 938 317 | 4090/121 | 0. 000 195 004 |
| | 10 | 1021/121 | 0. 000 348 154 | 5021/121 | 0. 000 070 795 |
| | 11 | 10 | 0. 000 100 657 | 50 | 0. 000 020 131 |
| | 12 | 1417/121 | 0. 000 023 339 | 7177/121 | 0. 000 004 607 |
| | 13 | 1642/121 | 0. 000 004 449 | 8402/121 | 0. 000 000 869 |
| | 14 | 1885/121 | 0. 000 000 712 | 9725/121 | 0. 000 000 138 |
| | 15 | 2146/121 | 0. 000 000 097 | 11146/121 | 0. 000 000 018 |
| | 16 | 2425/121 | 0. 000 000 022 | 12665/121 | 0. 000 000 002 |
| | 17 | 2722/121 | 0. 000 000 002 | 14282/121 | 0. 000 000 000 |
| | 18 | 3037/121 | 0. 000 000 000 | | |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ n | | | | |
| 0 | 1 | 0. 022 086 660 | 1 | 0. 022 086 660 |
| 1 | 565/529 | 0. 019 955 541 | 725/529 | 0. 015 551 560 |
| 2 | 673/529 | 0. 016 819 915 | 1313/529 | 0. 008 621 327 |
| 3 | 853/529 | 0. 012 473 917 | 2293/529 | 0. 004 644 933 |
| 4 | 1105/529 | 0. 009 162 897 | 3665/529 | 0. 002 762 619 |
| 5 | 1429/529 | 0. 006 650 035 | 5429/529 | 0. 001 750 396 |
| 6 | 1825/529 | 0. 004 468 509 | 7585/529 | 0. 001 075 152 |
| 7 | 2293/529 | 0. 003 191 050 | 10133/529 | 0. 000 722 104 |
| 8 | 2833/529 | 0. 002 215 398 | 13073/529 | 0. 000 480 090 |
| 11.5 9 | 3455/529 | 0. 001 244 200 | 16405/529 | 0. 000 261 278 |
| 10 | 4129/529 | 0. 000 534 343 | 20129/529 | 0. 000 109 608 |
| 11 | 4885/529 | 0. 000 177 726 | 24245/529 | 0. 000 035 809 |
| 12 | 5713/529 | 0. 000 047 045 | 28753/529 | 0. 000 009 347 |
| 13 | 6613/529 | 0. 000 010 170 | 33653/529 | 0. 000 001 998 |
| 14 | 7585/529 | 0. 000 001 835 | 38945/529 | 0. 000 000 357 |
| 15 | 8629/529 | 0. 000 000 281 | 44629/529 | 0. 000 000 054 |
| 16 | 9745/529 | 0. 000 000 037 | 50705/529 | 0. 000 000 0007 |
| 17 | 10933/529 | 0. 000 000 004 | 57173/529 | 0. 000 000 000 |
| 18 | 12193/529 | 0. 000 000 000 | 64033/529 | |

| | VII | VIII | IX | X |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. VII | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. IX |
| | ql=3 | | ql=7 | |
| $X_F$ n | | | | |
| 0 | 1 | 0. 020 966 886 | 1 | 0. 020 966 886 |
| 1 | 1.0625 | 0. 019 434 237 | 193/144 | 0. 015 406 416 |
| 2 | 1.25 | 0. 016 238 030 | 340/144 | 0. 008 596 604 |
| 3 | 1.5625 | 0. 012 597 435 | 585/144 | 0. 004 845 167 |
| 4 | 2.0 | 0. 009 142 967 | 928/144 | 0. 002 837 472 |
| 5 | 2.5625 | 0. 006 869 584 | 1369/144 | 0. 001 851 626 |
| 6 | 3.25 | 0. 004 761 509 | 1908/144 | 0. 001 167 917 |
| 7 | 4.0625 | 0. 003 326 146 | 2545/144 | 0. 000 764 556 |
| 8 | 5.0 | 0. 002 426 163 | 3280/144 | 0. 000 532 572 |
| 9 | 6.0625 | 0. 001 539 467 | 4113/144 | 0. 000 326 757 |
| 12.0 | | | | |
| 10 | 7.25 | 0. 000 761 575 | 5044/144 | 0. 000 157 629 |
| 11 | 8.5625 | 0. 000 291 057 | 6073/144 | 0. 000 059 093 |
| 12 | 10. | 0. 000 087 891 | 50 | 0. 000 017 578 |
| 13 | 11.5625 | 0. 000 021 524 | 8425/144 | 0. 000 004 253 |
| 14 | 13.25 | 0. 000 004 373 | 9748/144 | 0. 000 000 856 |
| 15 | 15.0625 | 0. 000 000 751 | 11169/144 | 0. 000 000 145 |
| 16 | 17.0 | 0. 000 000 110 | 12688/144 | 0. 000 000 021 |
| 17 | 19.0625 | 0. 000 000 014 | 14305/144 | 0. 000 000 002 |
| 18 | 21.25 | 0. 000 000 001 | 16020/144 | 0. 000 000 000 |
| 19 | 23.5625 | 0. 000 000 000 | 17833/144 | |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 0.5 | 0 | 1 | 0. 317 106 269 | 1 | 0. 317 106 269 |
| | 1 | 485 | 0. 000 016 579 | 901 | 0. 000 008 924 |
| | 2 | 1937 | 0. 000 000 037 | 3601 | 0. 000 000 020 |
| | 3 | 4357 | 0. 000 000 000 | 8101 | 0. 000 000 000 |
| 1.0 | 0 | 1 | 0. 273 385 667 | 1 | 0. 273 385 667 |
| | 1 | 122 | 0. 000 236 790 | 226 | 0. 000 127 825 |
| | 2 | 485 | 0. 000 002 195 | 901 | 0. 000 001 182 |
| | 3 | 1090 | 0. 000 000 018 | 2026 | 0. 000 000 009 |
| | 4 | 1937 | 0. 000 000 000 | 3601 | 0. 000 000 000 |
| 1.5 | 0 | 1 | 0. 214 894 401 | 1 | 0. 214 894 401 |
| | 1 | 493/9 | 0. 000 991 685 | 909/9 | 0. 000 537 844 |
| | 2 | 1945/9 | 0. 000 021 688 | 3609/9 | 0. 000 011 688 |
| | 3 | 4365/9 | 0. 000 000 421 | 8109/9 | 0. 000 000 226 |
| | 4 | 7753/9 | 0. 000 000 006 | 14405/9 | 0. 000 000 003 |
| | 5 | 12109/9 | 0. 000 000 000 | 22509/9 | 0. 000 000 000 |
| 2.0 | 0 | 1 | 0. 156 763 851 | 1 | 0. 156 763 851 |
| | 1 | 125/4 | 0. 002 403 109 | 229/4 | 0. 001 311 741 |
| | 2 | 122 | 0. 000 270 552 | 226 | 0. 000 146 050 |
| | 3 | 1093 | 0. 000 003 578 | 2029/4 | 0. 000 001 927 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 2.0 | 4 | 485 | 0. 000 000 097 | 901 | 0. 000 000 052 |
| | 5 | 3029/4 | 0. 000 000 001 | 5629/4 | 0. 000 000 000 |
| | 6 | 1090 | 0. 000 000 000 | 2026 | |
| 2.5 | 0 | 1 | 0. 110 702 286 | 1 | 0. 110 702 286 |
| | 1 | 509/25 | 0. 004 177 286 | 925/25 | 0. 002 298 636 |
| | 2 | 1961/25 | 0. 000 293 118 | 3625/25 | 0. 000 158 566 |
| | 3 | 4381/25 | 0. 000 017 268 | 8125/25 | 0. 000 009 311 |
| | 4 | 7769/25 | 0. 000 000 756 | 14425/25 | 0. 000 000 407 |
| | 5 | 12125/25 | 0. 000 000 024 | 22525/25 | 0. 000 000 013 |
| | 6 | 17449/25 | 0. 000 000 000 | 32425/25 | 0. 000 000 000 |
| 3.0 | 0 | 1 | 0. 081 451 231 | 1 | 0. 081 451 231 |
| | 1 | 130/9 | 0. 005 765 630 | 26 | 0. 003 203 127 |
| | 2 | 493/9 | 0. 000 635 290 | 101 | 0. 000 344 552 |
| | 3 | 122 | 0. 000 057 222 | 226 | 0. 000 030 890 |
| | 4 | 1945/9 | 0. 000 003 763 | 401 | 0. 000 002 028 |
| | 5 | 3034/9 | 0. 000 000 183 | 626 | 0. 000 000 098 |
| | 6 | 485 | 0. 000 000 004 | 901 | 0. 000 000 002 |
| | 7 | 5938/9 | 0. 000 000 000 | 1226 | 0. 000 000 000 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 3.5 | 0 | 1 | 0. 066 852 651 | 1 | 0. 066 852 651 |
| | 1 | 533/49 | 0. 006 760 195 | 949/49 | 0. 003 796 821 |
| | 2 | 1985/49 | 0. 001 095 243 | 3649/49 | 0. 000 595 795 |
| | 3 | 4405/49 | 0. 000 143 875 | 8149/49 | 0. 000 077 773 |
| | 4 | 7793/49 | 0. 000 013 540 | 14449/49 | 0. 000 007 302 |
| | 5 | 12149/49 | 0. 000 000 933 | 22549/49 | 0. 000 000 502 |
| | 6 | 17473/49 | 0. 000 000 048 | 32749/49 | 0. 000 000 026 |
| | 7 | 23765/49 | 0. 000 000 002 | 44149/49 | 0. 000 000 001 |
| | 8 | 31025/49 | 0. 000 000 000 | 57649/49 | 0. 000 000 000 |
| 4.0 | 0 | 1 | 0. 060 848 254 | 1 | 0. 060 848 254 |
| | 1 | 137/16 | 0. 007 180 479 | 241/16 | 0. 004 081 849 |
| | 2 | 125/4 | 0. 001 576 406 | 229/4 | 0. 000 860 484 |
| | 3 | 1105/16 | 0. 000 291 272 | 2041/16 | 0. 000 157 695 |
| | 4 | 122 | 0. 000 037 941 | 226 | 0. 000 020 481 |
| | 5 | 3041/16 | 0. 000 003 566 | 5641/16 | 0. 000 001 922 |
| | 6 | 1093/4 | 0. 000 000 251 | 2029/4 | 0. 000 000 135 |
| | 7 | 5945/16 | 0. 000 000 013 | 11041/16 | 0. 000 000 007 |
| | 8 | 485 | 0. 000 000 000 | 901 | 0. 000 000 000 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 4.5 | 0 | 1 | 0. 057 358 432 | 1 | 0. 057 358 432 |
| | 1 | 565/81 | 0. 007 410 768 | 981/81 | 0. 004 268 179 |
| | 2 | 2017/81 | 0. 001 967 782 | 3681/81 | 0. 001 078 244 |
| | 3 | 4437/81 | 0. 000 493 515 | 8181/81 | 0. 000 267 660 |
| | 4 | 7825/81 | 0. 000 086 829 | 14481/81 | 0. 000 046 919 |
| | 5 | 12181/81 | 0. 000 010 856 | 22581/81 | 0. 000 005 856 |
| | 6 | 17505/81 | 0. 000 001 007 | 32481/81 | 0. 000 000 542 |
| | 7 | 23797/81 | 0. 000 000 007 | 44181/81 | 0. 000 000 003 |
| | 8 | 31057/81 | 0. 000 000 004 | 57681/81 | 0. 000 000 002 |
| | 9 | 39285/81 | 0. 000 000 000 | 72981/81 | 0. 000 000 000 |
| 5.0 | 0 | 1 | 0. 052 940 111 | 1 | 0. 052 940 111 |
| | 1 | 5.84 | 0. 007 857 427 | 10 | 0. 004 588 737 |
| | 2 | 20.36 | 0. 002 215 107 | 37 | 0. 001 218 907 |
| | 3 | 44.56 | 0. 000 719 803 | 80 | 0. 000 391 151 |
| | 4 | 78.44 | 0. 000 167 583 | 145 | 0. 000 090 656 |
| | 5 | 122 | 0. 000 027 362 | 226 | 0. 000 014 770 |
| | 6 | 175.24 | 0. 000 003 272 | 325 | 0. 000 001 764 |
| | 7 | 238.16 | 0. 000 000 298 | 442 | 0. 000 000 160 |
| | 8 | 310.76 | 0. 000 000 021 | 577 | 0. 000 000 011 |
| | 9 | 393.04 | 0. 000 000 001 | 730 | 0. 000 000 000 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| | 0 | 1 | 0. 047 231 244 | 1 | 0. 047 231 244 |
| | 1 | 605/121 | 0. 008 627 949 | 1021/121 | 0. 005 112 546 |
| | 2 | 2057/121 | 0. 002 356 380 | 3721/121 | 0. 001 302 627 |
| | 3 | 4477/121 | 0. 000 925 949 | 8221/121 | 0. 000 504 254 |
| | 4 | 7865/121 | 0. 000 279 164 | 14521/121 | 0. 000 151 203 |
| 5.5 | 5 | 12221/121 | 0. 000 058 680 | 22621/121 | 0. 000 031 702 |
| | 6 | 17545/121 | 0. 000 008 915 | 32521/121 | 0. 000 004 809 |
| | 7 | 23837/121 | 0. 000 001 023 | 44221/121 | 0. 000 000 551 |
| | 8 | 30097/121 | 0. 000 000 094 | 57721/121 | 0. 000 000 049 |
| | 9 | 39325/121 | 0. 000 000 006 | 72021/121 | 0. 000 000 003 |
| | 10 | 48521/121 | 0. 000 000 000 | 90121/121 | 0. 000 000 000 |
| | 0 | 1 | 0. 041 623 793 | 1 | 0. 041 623 793 |
| | 1 | 4.36111 | 0. 009 490 739 | 7.25 | 0. 005 708 988 |
| | 2 | 14.444 | 0. 002 490 295 | 26.00 | 0. 001 383 497 |
| | 3 | 31.2499 | 0. 001 078 339 | 57.25 | 0. 000 588 613 |
| | 4 | 54.777 | 0. 000 408 778 | 101 | 0. 000 221 702 |
| | 5 | 85.0277 | 0. 000 109 224 | 157.25 | 0. 000 059 059 |
| 6.0 | 6 | 122 | 0. 000 020 853 | 226 | 0. 000 011 256 |
| | 7 | 165.694 | 0. 000 002 972 | 307.25 | 0. 000 001 603 |
| | 8 | 216.111 | 0. 000 000 328 | 401 | 0. 000 000 177 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| | 9 | 273.2499 | 0. 000 000 029 | 507.25 | 0. 000 000 015 |
| | 10 | 337.111 | 0. 000 000 002 | 626.00 | 0. 000 000 001 |
| 6.0 | 11 | 407.6944 | 0. 000 000 000 | 757.25 | 0. 000 000 000 |
| | 0 | 1 | 0. 037 470 534 | 1 | 0. 037 470 534 |
| | 1 | 653/169 | 0. 010 115 914 | 1069/169 | 0. 006 179 319 |
| | 2 | 2105/169 | 0. 002 099 882 | 3769/169 | 0. 001 507 894 |
| | 3 | 4525/169 | 0. 001 174 658 | 8269/169 | 0. 000 642 802 |
| | 4 | 7913/169 | 0. 000 535 029 | 14569/169 | 0. 000 290 595 |
| | 5 | 12269/169 | 0. 000 179 169 | 22669/169 | 0. 000 096 970 |
| 6.5 | 6 | 17593/169 | 0. 000 042 600 | 32569/169 | 0. 000 023 011 |
| | 7 | 23885/169 | 0. 000 007 476 | 44269/169 | 0. 000 004 033 |
| | 8 | 31145/169 | 0. 000 000 964 | 57769/169 | 0. 000 000 520 |
| | 9 | 39373/169 | 0. 000 000 108 | 73069/169 | 0. 000 000 058 |
| | 10 | 48569/169 | 0. 000 000 009 | 90169/169 | 0. 000 000 005 |
| | 11 | 58733/169 | 0. 000 000 000 | 109069/169 | 0. 000 000 000 |
| | 0 | 1 | 0. 035 028 603 | 1 | 0. 035 028 603 |
| | 1 | 170/49 | 0. 010 364 200 | 274/49 | 0. 006 430 343 |
| 7.0 | 2 | 533/49 | 0. 002 991 391 | 949/49 | 0. 001 680 096 |
| | 3 | 1138/49 | 0. 001 245 079 | 2074/49 | 0. 000 683 173 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 7.0 | 4 | 1985/49 | 0. 000 637 676 | 3649/49 | 0. 000 346 886 |
| | 5 | 3074/49 | 0. 000 262 324 | 5674/49 | 0. 000 142 119 |
| | 6 | 4405/49 | 0. 000 077 036 | 8149/49 | 0. 000 041 642 |
| | 7 | 122 | 0. 000 016 526 | 226 | 0. 000 009 334 |
| | 8 | 7793/49 | 0. 000 002 697 | 14449/49 | 0. 000 001 454 |
| | 9 | 9850/49 | 0. 000 000 346 | 18274/49 | 0. 000 000 186 |
| | 10 | 12149/49 | 0. 000 000 036 | 22549/49 | 0. 000 000 019 |
| | 11 | 14690/49 | 0. 000 000 003 | 27274/49 | 0. 000 000 001 |
| | 12 | 17473/49 | 0. 000 000 000 | 32449/49 | 0. 000 000 000 |
| 7.5 | 0 | 1 | 0. 033 545 414 | 1 | 0. 033 545 414 |
| | 1 | 709/225 | 0. 010 378 816 | 1125/225 | 0. 006 540 961 |
| | 2 | 2161/225 | 0. 003 296 503 | 3825/225 | 0. 001 862 416 |
| | 3 | 4581/225 | 0. 001 330 872 | 8325/225 | 0. 000 732 339 |
| | 4 | 7969/225 | 0. 000 708 798 | 14625/225 | 0. 000 386 216 |
| | 5 | 12325/225 | 0. 000 346 991 | 22725/225 | 0. 000 188 192 |
| | 6 | 17649/225 | 0. 000 124 639 | 32625/225 | 0. 000 067 425 |
| | 7 | 23941/225 | 0. 000 032 495 | 44325/225 | 0. 000 017 551 |
| | 8 | 31201/225 | 0. 000 006 378 | 57825/225 | 0. 000 003 441 |
| | 9 | 39429/225 | 0. 000 000 978 | 73125/225 | 0. 000 000 527 |

| | XI | XII | XIII | XIV |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | ql=11 | | ql=15 | |
| $X_F$ | n | | | |
| 7.5 | 10 | 48625/225 | 0. 000 000 120 | 90225/225 | 0. 000 000 065 |
| | 11 | 58789/225 | 0. 000 000 012 | 109125/225 | 0. 000 000 006 |
| | 12 | 69921/225 | 0. 000 000 001 | 129825/225 | 0. 000 000 000 |
| | 13 | 82021/225 | 0. 000 000 000 | | |
| 8.0 | 0 | 1 | 0. 032 053 108 | 1 | 0. 032 053 108 |
| | 1 | 185/64 | 0. 010 429 985 | 289/64 | 0. 006 676 634 |
| | 2 | 137/16 | 0. 003 533 558 | 241/16 | 0. 002 008 703 |
| | 3 | 1153/64 | 0. 001 454 992 | 2089/64 | 0. 000 803 066 |
| | 4 | 125/4 | 0. 000 757 686 | 229/4 | 0. 000 413 584 |
| | 5 | 3089/64 | 0. 000 420 447 | 5689/64 | 0. 000 228 293 |
| | 6 | 1105/16 | 0. 000 182 104 | 2089/16 | 0. 000 096 326 |
| | 7 | 5993/64 | 0. 000 057 377 | 11089/64 | 0. 000 031 009 |
| | 8 | 122 | 0. 000 013 485 | 226 | 0. 000 007 279 |
| | 9 | 9865/64 | 0. 000 002 452 | 18289/64 | 0. 000 001 322 |
| | 10 | 3041/16 | 0. 000 000 356 | 5689/16 | 0. 000 000 190 |
| | 11 | 14705/64 | 0. 000 000 042 | 27289/64 | 0. 000 000 022 |
| | 12 | 1093/4 | 0. 000 000 004 | 2089/4 | 0. 000 000 002 |
| | 13 | 20513/64 | 0. 000 000 000 | 38089/64 | 0. 000 000 000 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| 8.5 | 0 | 1 | 0. 030 099 110 | 1 | 0. 030 099 110 |
| | 1 | 773/289 | 0. 010 674 742 | 1189/289 | 0. 006 939 929 |
| | 2 | 2225/289 | 0. 003 675 183 | 3889/289 | 0. 002 102 669 |
| | 3 | 4645/289 | 0. 001 606 640 | 8389/289 | 0. 000 889 598 |
| | 4 | 8033/289 | 0. 000 804 937 | 14689/289 | 0. 000 440 197 |
| | 5 | 12389/289 | 0. 000 475 202 | 22789/289 | 0. 000 258 338 |
| | 6 | 17713/289 | 0. 000 242 473 | 32689/289 | 0. 000 131 387 |
| | 7 | 24005/289 | 0. 000 091 693 | 44389/289 | 0. 000 049 586 |
| | 8 | 31265/289 | 0. 000 025 701 | 57889/289 | 0. 000 013 881 |
| | 9 | 39493/289 | 0. 000 005 522 | 73189/289 | 0. 000 002 979 |
| | 10 | 48689/289 | 0. 000 000 239 | 90289/289 | 0. 000 000 506 |
| | 11 | 58853/289 | 0. 000 000 130 | 109189/289 | 0. 000 000 070 |
| | 12 | 69985/289 | 0. 000 000 015 | 129889/289 | 0. 000 000 008 |
| | 13 | 82085/289 | 0. 000 000 001 | 152389/289 | 0. 000 000 000 |
| | 14 | 95153/289 | 0. 000 000 000 | 176689/289 | |
| 9.0 | 0 | 1 | 0. 027 904 243 | 1 | 0. 027 904 243 |
| | 1 | 202/81 | 0. 011 044 425 | 306/81 | 0. 007 290 764 |
| | 2 | 565/81 | 0. 003 766 548 | 981/81 | 0. 002 169 316 |
| | 3 | 130/9 | 0. 001 751 705 | 234/9 | 0. 000 973 169 |
| | 4 | 2017/81 | 0. 000 868 766 | 3681/81 | 0. 000 476 039 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| | 5 | 3106/81 | 0. 000 513 238 | 5706/81 | 0. 000 279 376 |
| | 6 | 493/9 | 0. 000 297 382 | 909/9 | 0. 000 161 286 |
| | 7 | 6010/81 | 0. 000 133 553 | 11106/81 | 0. 000 072 272 |
| | 8 | 7825/81 | 0. 000 044 473 | 14481/81 | 0. 000 024 032 |
| | 9 | 122 | 0. 000 011 255 | 226 | 0. 000 006 075 |
| 9.0 | 10 | 12181/81 | 0. 000 002 237 | 22581/81 | 0. 000 001 207 |
| | 11 | 14722/81 | 0. 000 000 359 | 27306/81 | 0. 000 000 193 |
| | 12 | 1945/9 | 0. 000 000 047 | 3609/9 | 0. 000 000 025 |
| | 13 | 20530/81 | 0. 000 000 005 | 38106/81 | 0. 000 000 002 |
| | 14 | 23791/81 | 0. 000 000 000 | 44181/81 | 0. 000 000 000 |
| | 0 | 1 | 0. 025 983 416 | 1 | 0. 025 983 416 |
| | 1 | 845/361 | 0. 011 337 172 | 1261/361 | 0. 007 597 074 |
| | 2 | 2297/361 | 0. 003 882 419 | 3961/361 | 0. 002 251 431 |
| | 3 | 4717/361 | 0. 001 860 735 | 8461/361 | 0. 001 037 358 |
| | 4 | 8105/361 | 0. 000 952 788 | 14761/361 | 0. 000 523 158 |
| | 5 | 12461/361 | 0. 000 544 990 | 22861/361 | 0. 000 297 061 |
| 9.5 | 6 | 17785/361 | 0. 000 340 729 | 32761/361 | 0. 000 184 972 |
| | 7 | 24077/361 | 0. 000 178 557 | 44461/361 | 0. 000 096 694 |
| | 8 | 31337/361 | 0. 000 070 286 | 57961/361 | 0. 000 038 000 |
| | 9 | 39565/361 | 0. 000 020 898 | 73261/361 | 0. 000 011 286 |

| | XI | XII | XIII | XIV |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | ql=11 | | ql=15 | |
| $X_F$ n | | | | |
| 10 | 48761/361 | 0. 000 004 839 | 90361/361 | 0. 000 002 611 |
| 11 | 58925/361 | 0. 000 000 898 | 109261/361 | 0. 000 000 484 |
| 12 | 70057/361 | 0. 000 000 137 | 129961/361 | 0. 000 000 074 |
| 9.5 13 | 82157/361 | 0. 000 000 017 | 152461/361 | 0. 000 000 009 |
| 14 | 95225/361 | 0. 000 000 001 | 176761/361 | 0. 000 000 001 |
| 15 | 109261/361 | 0. 000 000 000 | 202861/361 | 0. 000 000 000 |
| 0 | 1.00 | 0. 024 646 010 | 1 | 0. 024 646 010 |
| 1 | 2.21 | 0. 011 410 197 | 3.25 | 0. 007 758 934 |
| 2 | 5.84 | 0. 004 061 866 | 10.00 | 0. 002 372 129 |
| 3 | 11.89 | 0. 001 932 002 | 21.25 | 0. 001 081 012 |
| 4 | 20.36 | 0. 001 044 242 | 37.00 | 0. 000 574 615 |
| 5 | 31.25 | 0. 000 582 945 | 57.25 | 0. 000 318 201 |
| 6 | 44.56 | 0. 000 371 834 | 82.00 | 0. 000 202 060 |
| 7 | 60.29 | 0. 000 220 983 | 11.25 | 0. 000 119 758 |
| 10.0 8 | 78.44 | 0. 000 102 005 | 145.00 | 0. 000 055 181 |
| 9 | 99.01 | 0. 000 035 537 | 183.25 | 0. 000 019 200 |
| 10 | 122.00 | 0. 000 009 565 | 226.00 | 0. 000 005 163 |
| 11 | 147.41 | 0. 000 002 049 | 273.25 | 0. 000 001 105 |
| 12 | 175.24 | 0. 000 000 358 | 325.00 | 0. 000 000 193 |

| | XI | XII | XIII | XIV |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | ql=11 | | ql=15 | |
| $X_F$ n | | | | |
| 13 | 205.49 | 0. 000 000 052 | 281.25 | 0. 000 000 028 |
| 14 | 238.16 | 0. 000 000 006 | 442.00 | 0. 000 000 003 |
| 10.0 15 | 273.25 | 0. 000 000 000 | 507.25 | 0. 000 000 000 |
| 0 | 1 | 0. 023 780 906 | 1 | 0. 023 780 906 |
| 1 | 925/441 | 0. 011 296 435 | 1341/441 | 0. 007 792 097 |
| 2 | 2377/441 | 0. 004 279 520 | 4041/441 | 0. 002 517 302 |
| 3 | 4797/441 | 0. 001 991 378 | 8541/441 | 0. 001 118 445 |
| 4 | 8185/441 | 0. 001 124 210 | 14841/441 | 0. 000 620 016 |
| 5 | 12541/441 | 0. 000 633 680 | 22941/441 | 0. 000 346 409 |
| 6 | 17865/441 | 0. 000 395 949 | 32841/441 | 0. 000 215 390 |
| 7 | 24157/441 | 0. 000 256 041 | 44541/441 | 0. 000 138 864 |
| 10.5 8 | 31417/441 | 0. 000 136 712 | 58041/441 | 0. 000 074 001 |
| 9 | 39645/441 | 0. 000 055 600 | 73341/441 | 0. 000 030 055 |
| 10 | 48841/441 | 0. 000 017 368 | 90441/441 | 0. 000 009 379 |
| 11 | 59005/441 | 0. 000 004 284 | 109341/441 | 0. 000 002 312 |
| 12 | 70137/441 | 0. 000 000 857 | 130041/441 | 0. 000 000 462 |
| 13 | 82237/441 | 0. 000 000 142 | 152541/441 | 0. 000 000 076 |
| 14 | 95305/441 | 0. 000 000 019 | 176841/441 | 0. 000 000 010 |
| 15 | 109341/441 | 0. 000 000 002 | 202941/441 | 0. 000 000 000 |

| | | XI | XII | XIII | XIV |
|---|---|---|---|---|---|
| | | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | | ql=11 | | ql=15 | |
| $X_F$ | n | | | | |
| | 0 | 1 | 0. 023 023 101 | 1 | 0. 023 023 101 |
| | 1 | 2 | 0. 011 156 862 | 346/121 | 0. 007 803 354 |
| | 2 | 5 | 0. 004 471 181 | 1021/121 | 0. 002 649 426 |
| | 3 | 10 | 0. 002 069 893 | 2146/121 | 0. 001 167 088 |
| | 4 | 17 | 0. 001 182 198 | 3721/121 | 0. 000 653 529 |
| | 5 | 26 | 0. 000 693 744 | 5746/121 | 0. 000 379 832 |
| | 6 | 37 | 0. 000 421 320 | 8221/121 | 0. 000 229 442 |
| | 7 | 50 | 0. 000 282 136 | 11146/121 | 0. 000 153 142 |
| 11.0 | 8 | 65 | 0. 000 170 362 | 14521/121 | 0. 000 092 273 |
| | 9 | 82 | 0. 000 080 383 | 18346/121 | 0. 000 043 473 |
| | 10 | 101 | 0. 000 029 086 | 22621/121 | 0. 000 015 713 |
| | 11 | 122 | 0. 000 008 250 | 226/121 | 0. 000 004 453 |
| | 12 | 145 | 0. 000 001 884 | 32521/121 | 0. 000 001 016 |
| | 13 | 170 | 0. 000 000 355 | 38146/121 | 0. 000 000 191 |
| | 14 | 197 | 0. 000 000 056 | 44221/121 | 0. 000 000 030 |
| | 15 | 226 | 0. 000 000 007 | 50746/121 | 0. 000 000 000 |
| | 16 | 257 | 0. 000 000 000 | | |

| | XI | XII | XIII | XIV |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | ql=11 | | ql=15 | |
| $X_F$ n | | | | |
| 0 | 1 | 0. 022 086 660 | 1 | 0. 022 086 660 |
| 1 | 1013/529 | 0. 011 130 188 | 1429/529 | 0. 007 890 049 |
| 2 | 2465/529 | 0. 004 592 212 | 4129/529 | 0. 002 741 536 |
| 3 | 4885/529 | 0. 002 178 147 | 8629/529 | 0. 001 233 080 |
| 4 | 8273/529 | 0. 001 223 860 | 14929/529 | 0. 000 678 210 |
| 5 | 12629/529 | 0. 000 752 466 | 23029/529 | 0. 000 412 649 |
| 6 | 17953/529 | 0. 000 454 243 | 32929/529 | 0. 000 247 654 |
| 7 | 24245/529 | 0. 000 301 797 | 44629/529 | 0. 000 163 953 |
| 11.5 | | | | |
| 8 | 31505/529 | 0. 000 199 213 | 58129/529 | 0. 000 107 970 |
| 9 | 39733/529 | 0. 000 107 876 | 73429/529 | 0. 000 058 372 |
| 10 | 48929/529 | 0. 000 045 091 | 90529/529 | 0. 000 024 371 |
| 11 | 59093/529 | 0. 000 014 691 | 109429/529 | 0. 000 007 933 |
| 12 | 70225/529 | 0. 000 003 827 | 130129/529 | 0. 000 002 065 |
| 13 | 82325/529 | 0. 000 000 816 | 152629/529 | 0. 000 000 440 |
| 14 | 95393/529 | 0. 000 000 145 | 176929/529 | 0. 000 000 078 |
| 15 | 109429/529 | 0. 000 000 022 | 203029/529 | 0. 000 000 011 |
| 16 | 124433/529 | 0. 000 000 002 | 230929/529 | 0. 000 000 001 |
| 17 | 140405/529 | 0. 000 000 000 | 260629/529 | 0. 000 000 000 |

| | XI | XII | XIII | XIV |
|---|---|---|---|---|
| | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XI | $1+(ql)^2\frac{n^2}{X_F^2}$ | Col. VI/Col. XIII |
| | ql=11 | | ql=15 | |
| $X_F$ | n | | | |
| 0 | 1 | 0. 020 966 886 | 1 | 0. 020 966 886 |
| 1 | 265/144 | 0. 011 220 521 | 2.5625 | 0. 008 058 098 |
| 2 | 628/144 | 0. 004 654 212 | 7.25 | 0. 002 799 660 |
| 3 | 1233/144 | 0. 002 298 802 | 15.0625 | 0. 001 306 787 |
| 4 | 2080/144 | 0. 001 265 949 | 26 | 0. 000 703 305 |
| 5 | 3169/144 | 0. 000 799 897 | 40.0625 | 0. 000 439 396 |
| 6 | 4500/144 | 0. 000 495 196 | 57.25 | 0. 000 270 304 |
| 7 | 6073/144 | 0. 000 320 401 | 77.5625 | 0. 000 174 213 |
| 8 | 7888/144 | 0. 000 221 455 | 101 | 0. 000 120 107 |
| $12.0_9$ | 9945/144 | 0. 000 135 138 | 127.5625 | 0. 000 073 164 |
| 10 | 12244/144 | 0. 000 064 936 | 157.25 | 0. 000 035 112 |
| 11 | 14785/144 | 0. 000 024 272 | 190.0625 | 0. 000 013 112 |
| 12 | 122 | 0. 000 007 204 | 226 | 0. 000 003 889 |
| 13 | 20593/144 | 0. 000 001 740 | 265.0625 | 0. 000 000 938 |
| 14 | 23860/144 | 0. 000 000 349 | 307.25 | 0. 000 000 188 |
| 15 | 27369/144 | 0. 000 000 059 | 352.5625 | 0. 000 000 032 |
| 16 | 31120/144 | 0. 000 000 008 | 401 | 0. 000 000 004 |
| 17 | 35113/144 | 0. 000 000 001 | 452.5625 | 0. 000 000 000 |
| 18 | 39348/144 | 0. 000 000 000 | | |

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2. Symbols used herein:

$q$ = sound wave vector
$l$ = electronic mean free path
$v_F$ = Fermi velocity of electrons
$c_s$ = speed of sound
$m$ = electronic mass
$M$ = ionic mass
$-e$ = electronic charge

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VII

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