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Addendum and Corrigendum to "High-Precision Values of the Gamma Function and of Some Related Coefficients"

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Abstract. I present corrected values for the Tables IV and V together with an extension of the Tables I–V. I also present an 80D value of my constant F.

Unfortunately there were some errors at most in the 10 last decimal places in the values presented in Tables IV and V of our paper [2]. Owing to a very convincing memorandum [3], which was kindly sent to us from Dr. William A. Johnson, I made a recalculation of our presented values. The errors were then revealed.

At the same time I decided to extend the Tables I–V up to $k = 60$ for the Zeta values and thus up to $k = 61$ for the others. This made it possible to use Eqs. (3.3) and (3.5) also to calculate the values belonging to the sets I_2 and I_4, respectively. The intervals for x will now be $0 < x < 0.3726$, $|x| < 0.3804$ and $-0.3665 < x < 0$. Using the coefficients a_k and d_k, we may thus compute the value of the Gamma function for any real x to 80D by means of Eqs. (3.3)–(3.5).

Using the coefficients a_k and the procedure in [1], I could also now produce a value to 80D of my constant

$$F = 2.80777\ 02420\ 28519\ 36522\ 15011\ 86557\ 77293\ 23080$$
$$85920\ 93019\ 82912\ 20054\ 80959\ 71008\ 89121\ 90167\overline{.}$$

Other values in our paper were not affected by these corrections.

Acknowledgement. I want to thank Dr. William A. Johnson for calling our attention to the corrections needed.

TABLE I (*continued*)

Values of the Riemann Zeta function for integral values

Zeta(52) = 1.00000 00000 00000 22204 46050 79804 19839 99320 09420 46539 64236 65432 94389 34392 36654 04256
Zeta(53) = 1.00000 00000 00000 11102 23025 14106 61337 20544 56992 13827 02483 22290 04426 25934 09233 33089
Zeta(54) = 1.00000 00000 00000 05551 11512 48454 81243 72373 65905 09430 28167 23550 61652 68095 85368 07516
Zeta(55) = 1.00000 00000 00000 02775 55756 21361 24172 58163 24538 54069 76898 48903 74369 02721 87963 36488
Zeta(56) = 1.00000 00000 00000 01387 77878 09725 23276 28390 94906 50022 19077 18624 68615 88673 48024 93423
Zeta(57) = 1.00000 00000 00000 00693 88939 04544 15369 74460 85326 24980 92748 35874 17934 71311 33654 51618
Zeta(58) = 1.00000 00000 00000 00346 94469 52165 92262 47442 71496 10933 46219 50470 62700 58062 44000 34281
Zeta(59) = 1.00000 00000 00000 00173 47234 76047 57657 20489 72969 93759 59074 78054 47890 72966 32890 24671
Zeta(60) = 1.00000 00000 00000 00086 73617 38011 99337 28342 05506 73429 51487 90714 14574 06328 93710 87238

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TABLE II (*continued*)

Values of the coefficients in the expansion of the inverted Gamma function for s = 1

a(53) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00003 73658 78345 35612 55403 45591 21270 31637
a(54) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 26283 32980 94019 54490 89037 61187 36394
a(55) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00929 81759 95376 88629 96016 68991 51817
a(56) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00023 27942 41869 94705 98604 26205 56223
a(57) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00006 16962 08352 44387 42035 44317 73151
a(58) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 49282 95586 77098 99305 04458 68221
a(59) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 02183 51318 34145 10697 27782 84987
a(60) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00012 18722 18914 75165 55250 45261
a(61) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00007 11710 88416 62874 63194 56527

TABLE III (*continued*)

Values of the coefficients in the expansion of the Gamma function for s = 1

b(53) = 0.99999 99999 99999 88897 76975 63279 81740 51400 96321 24250 50398 09113 02697 46319 72942 85261
b(54) = -0.99999 99999 99999 94448 88487 77340 66363 25127 76747 98430 40939 74512 55633 09638 78447 17379
b(55) = 0.99999 99999 99999 97224 44243 87237 25008 34390 04811 84392 64370 97920 06013 05664 13691 64592
b(56) = -0.99999 99999 99999 98612 22121 93140 93112 00807 93773 27682 63605 63236 01727 27518 17031 61113
b(57) = 0.99999 99999 99999 99306 11060 96411 23425 01525 97313 27805 36596 66798 17828 07174 11784 93167
b(58) = -0.99999 99999 99999 99653 05530 48152 54002 11116 40991 33207 46278 79121 20567 18223 14486 83635
b(59) = 0.99999 99999 99999 99826 52765 24058 57764 24004 20095 30337 31223 31159 69546 36747 74549 54032
b(60) = -0.99999 99999 99999 99913 26382 62023 39136 51066 14607 53961 66273 29713 84013 78370 12649 36073
b(61) = 0.99999 99999 99999 99956 63191 31009 72986 38449 93327 99943 14839 20075 69033 31223 93565 73453

TABLE IV (*corrected and continued*)

Values of the coefficients in the expansion of the Gamma function for s = 3/2

c(20) = -0.00030 07176 71200 56376 19066 02886 49784 35376 31145 96634 48783 28920 64831 64974 58934 43687
c(21) = 0.00020 04813 77049 05741 94009 82011 47684 33453 36157 87241 63377 88621 21677 06693 48612 50598
c(22) = -0.00013 36554 23459 29399 54756 50331 27853 01242 01755 85915 24419 25690 77270 29904 26756 58785
c(23) = 0.00008 91040 84561 05664 04004 21412 26639 38782 39331 08834 30564 32635 48171 94400 32978 93224
c(24) = -0.00005 94029 10632 31535 13012 25167 21857 78346 10450 64335 77096 25310 08342 49411 34066 18864
c(25) = 0.00003 96020 15464 87878 36361 72078 33491 09552 06150 62389 95320 37589 33484 14582 24681 89614
c(26) = -0.00002 64013 73662 48702 57551 88087 54784 96532 13206 92752 77718 82657 34241 25067 91753 13392
c(27) = 0.00001 76009 27783 22951 64529 72681 33788 27811 77736 52187 06775 10448 67827 67777 76442 37999
c(28) = -0.00001 17339 56658 93706 36684 37940 59902 36069 50655 16376 27388 49518 25769 32793 00087 62887
c(29) = 0.00000 78226 39694 04943 19435 33876 71525 53840 47916 30500 55934 03932 23113 18428 07044 40098
c(30) = -0.00000 52150 93897 94887 37143 33551 93104 39418 36686 35542 06709 44825 84931 43113 60123 96627
c(31) = 0.00000 34767 29572 73591 15713 22171 61285 64384 05000 41716 85149 38869 57508 51864 30836 36331
c(32) = -0.00000 23178 19838 13297 60470 39693 92435 15019 68400 22859 52331 45919 28968 78368 92847 68483
c(33) = 0.00000 15452 13274 61256 09181 90541 25142 92738 80392 18072 17360 28503 82135 41330 24529 85442
c(34) = -0.00000 10301 42202 75135 60058 92014 61242 31274 52613 15377 41648 31494 34995 45801 34496 75372
c(35) = 0.00000 06867 61476 37145 43450 64507 45562 17745 85887 55205 77053 80494 04224 73002 52641 25393
c(36) = -0.00000 04578 40987 39586 32763 38171 82045 54054 26493 96367 12796 71874 62121 69597 48887 60706
c(37) = 0.00000 03052 27326 18986 83103 68655 64826 08903 33865 47656 61817 11737 72017 02282 81470 59507
c(38) = -0.00000 02034 84884 63029 65547 97896 18473 99005 24248 74575 58748 51090 04102 55916 66545 40227
c(39) = 0.00000 01356 56589 95501 82701 91952 37968 76252 71942 70730 71092 90739 28727 86109 37244 41045
c(40) = -0.00000 00904 37726 71727 37863 08497 15425 60565 38098 48512 37762 17889 03701 01031 93274 26899
c(41) = 0.00000 00602 91817 84375 38465 01769 93898 55945 06013 35063 94966 85861 49314 14662 85576 41491
c(42) = -0.00000 00401 94545 24206 44303 45524 37362 97737 00774 07221 33401 58542 14733 49092 13817 36700
c(43) = 0.00000 00267 96363 49986 77010 42160 90373 56985 36663 90711 69859 40713 98770 03761 39886 26265
c(44) = -0.00000 00178 64242 33530 83666 59711 33835 57223 12310 02056 00685 14945 73265 37316 10732 82854
c(45) = 0.00000 00119 09494 89103 08709 13462 69578 41772 91879 71520 63867 90118 24265 02730 17917 78320
c(46) = -0.00000 00079 39663 26101 73645 56822 06567 44089 70669 48459 04685 63050 59462 57210 35157 76954
c(47) = 0.00000 00052 93108 84081 02899 57511 08455 25307 28220 19044 74985 66930 35495 06481 64739 45404
c(48) = -0.00000 00035 28739 22725 96787 41570 97129 66874 04484 52906 40263 72065 77619 56691 42016 59084
c(49) = 0.00000 00023 52492 81819 42466 69590 37576 20462 03941 44952 09392 91776 48070 49350 66005 93122
c(50) = -0.00000 00015 68328 54547 12821 16644 41689 81494 39758 28853 73731 73620 29860 69147 44158 28132
c(51) = 0.00000 00010 45552 36365 09018 12577 64217 21101 19877 12791 34863 83922 62313 52187 55194 54031
c(52) = -0.00000 00006 97034 90910 19533 68991 26839 53340 14203 06814 69181 21993 99273 23125 89867 12421
c(53) = 0.00000 00004 64689 93940 18431 10240 54206 84552 76982 19948 55412 56796 53739 76605 74420 05564
c(54) = -0.00000 00003 09793 29293 47784 19193 35245 16200 82648 95594 92278 64790 75076 84705 03102 72596
c(55) = 0.00000 00002 06528 86195 66054 84409 08258 28083 63875 28918 54011 27373 58816 46549 51851 89885
c(56) = -0.00000 00001 37685 90797 11049 38251 55158 29650 43759 21401 96557 42834 41130 32741 29003 31500
c(57) = 0.00000 00000 91790 60531 40838 04959 25894 69139 30928 50313 62964 23317 69301 76570 21720 15751
c(58) = -0.00000 00000 61193 73687 60614 08422 80320 13947 27732 83079 18620 83522 19176 65845 52679 93989
c(59) = 0.00000 00000 40795 82458 40431 54328 52314 71138 94562 39501 99348 08283 76884 77364 65608 30960
c(60) = -0.00000 00000 27197 21638 93629 89037 67777 50648 18513 41478 98722 89151 64674 82987 39946 14367
c(61) = 0.00000 00000 18131 47759 29090 13819 25029 37479 00167 62559 53828 18854 73406 21735 27437 58609

TABLE V (*corrected and continued*)

Values of the coefficients in the expansion of the inverted Gamma function for $s = 3/2$

d(22) = 0.00000 00000 00169 46340 90432 05222 67740 94974 38014 13022 65545 63535 59019 78203 07906 97508
d(23) = -0.00000 00000 00027 87575 67071 25752 08297 53147 96493 29340 82681 07805 36761 79478 59550 19175
d(24) = 0.00000 00000 00001 86703 94695 06530 54191 19188 40589 11440 53485 06186 66982 61684 91953 71878
d(25) = 0.00000 00000 00000 13049 49900 85879 86588 17799 98927 35780 40861 92882 68833 50321 38856 35941
d(26) = -0.00000 00000 00000 04858 87414 41877 86529 61731 08402 98295 71065 90453 72022 35628 34674 10187
d(27) = 0.00000 00000 00000 00582 95426 92459 46783 18599 84244 21052 15780 29982 96525 21865 05927 44093
d(28) = -0.00000 00000 00000 00025 92909 41799 37838 70477 84514 25919 18218 95695 57926 68398 65789 88535
d(29) = -0.00000 00000 00000 00003 32675 40102 85788 59871 42882 20413 88729 54026 03708 80374 40064 46886
d(30) = 0.00000 00000 00000 00000 79449 61635 76810 53924 96881 65457 63873 70190 56982 80506 50196 09016
d(31) = -0.00000 00000 00000 00000 07755 54328 84373 57293 90253 77073 16772 37834 35449 41906 17538 98088
d(32) = 0.00000 00000 00000 00000 00255 33736 29132 96957 91806 30480 15362 58531 88942 07410 97570 27149
d(33) = 0.00000 00000 00000 00000 00042 74520 16014 71733 79460 02920 72363 42310 60718 16496 48645 20114
d(34) = -0.00000 00000 00000 00000 00008 26338 13746 68449 50568 79321 72514 28478 54547 49187 06390 20671
d(35) = 0.00000 00000 00000 00000 00000 71081 87657 25339 79736 55066 50482 39651 03124 66698 42696 67418
d(36) = -0.00000 00000 00000 00000 00000 02074 94638 87704 29612 45013 10690 01248 14732 98561 32833 42525
d(37) = -0.00000 00000 00000 00000 00000 00328 59544 06994 86048 30125 91386 18242 74687 86599 77267 37605
d(38) = 0.00000 00000 00000 00000 00000 00058 19433 90819 87478 73747 69479 02225 03415 36340 08311 84450
d(39) = -0.00000 00000 00000 00000 00000 00004 70293 21304 49893 36039 90226 26453 86248 96238 86004 13380
d(40) = 0.00000 00000 00000 00000 00000 00000 14478 55651 58528 64715 71007 47334 16737 14946 90509 51186
d(41) = 0.00000 00000 00000 00000 00000 00000 01597 83150 54786 78867 34059 40543 53327 73835 18755 37660
d(42) = -0.00000 00000 00000 00000 00000 00000 00287 82471 74761 34448 59106 01443 70749 76498 12804 21786
d(43) = 0.00000 00000 00000 00000 00000 00000 00023 00886 40061 20204 75117 23789 27644 25923 08001 95226
d(44) = -0.00000 00000 00000 00000 00000 00000 00000 81524 69850 72319 69959 00845 41422 71516 81270 79106
d(45) = -0.00000 00000 00000 00000 00000 00000 00000 04842 01452 13897 81552 19553 33904 52797 10209 36817
d(46) = 0.00000 00000 00000 00000 00000 00000 00000 01018 82590 41957 85489 64669 06836 98274 81276 99713
d(47) = -0.00000 00000 00000 00000 00000 00000 00000 00084 12953 04954 03489 52788 55482 99738 59773 97365
d(48) = 0.00000 00000 00000 00000 00000 00000 00000 00003 48870 05836 57446 86098 51780 64378 25829 32007
d(49) = 0.00000 00000 00000 00000 00000 00000 00000 00000 07563 10899 94869 57784 54309 91541 16591 68917
d(50) = -0.00000 00000 00000 00000 00000 00000 00000 00000 02589 53190 69537 33195 18160 84218 44005 41894
d(51) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00230 70239 97849 78036 96572 53603 39490 56039
d(52) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00011 09196 43852 26435 46500 35654 70678 97866
d(53) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 03979 09169 04853 02035 24506 25990 77982
d(54) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 04638 75302 52893 13358 12877 76304 29389
d(55) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00473 78773 55218 43976 95289 41319 92752
d(56) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00026 17289 95523 33790 71510 56558 24239
d(57) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 54156 54603 12930 09212 90677 99682
d(58) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 05442 20740 21090 62067 61171 57051
d(59) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00722 43429 31678 49509 98126 66349
d(60) = -0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00046 05280 92059 15371 82048 77391
d(61) = 0.00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00001 52436 24743 12988 09809 07069

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