Mathematica 11.3 Integration Test Results

Test results for the 233 problems in "8.6 Gamma functions.m"

Problem 1: Result more than twice size of optimal antiderivative.

$$\int x^{100}\, \text{Gamma}[0,\, a\, x]\, dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{101}\, x^{101}\, \text{Gamma}[0,\, a\, x] - \frac{\text{Gamma}[101,\, a\, x]}{101\, a^{101}}$$

Result (type 4, 828 leaves):

$$\frac{1}{101\, a^{101}}\, e^{-a\, x}$$

$\big(-93\,326\,215\,443\,944\,152\,681\,699\,238\,856\,266\,700\,490\,715\,968\,264\,381\,621\,468\,592\,963\,895\,217\,599\,993\,$
229\,915\,608\,941\,463\,976\,156\,518\,286\,253\,697\,920\,827\,223\,758\,251\,185\,210\,916\,864\,000\,000\,000\,000\,
000\,000\,000\,000 −

93\,326\,215\,443\,944\,152\,681\,699\,238\,856\,266\,700\,490\,715\,968\,264\,381\,621\,468\,592\,963\,895\,217\,599\,993\,
229\,915\,608\,941\,463\,976\,156\,518\,286\,253\,697\,920\,827\,223\,758\,251\,185\,210\,916\,864\,000\,000\,000\,000\,000\,
000\,000\,000 a x −

46\,663\,107\,721\,972\,076\,340\,849\,619\,428\,133\,350\,245\,357\,984\,132\,190\,810\,734\,296\,481\,947\,608\,799\,996\,
614\,957\,804\,470\,731\,988\,078\,259\,143\,126\,848\,960\,413\,611\,879\,125\,592\,605\,458\,432\,000\,000\,000\,000\,000\,
000\,000\,000 $a^2\, x^2$ −

15\,554\,369\,240\,657\,358\,780\,283\,206\,476\,044\,450\,081\,785\,994\,710\,730\,270\,244\,765\,493\,982\,536\,266\,665\,
538\,319\,268\,156\,910\,662\,692\,753\,047\,708\,949\,653\,471\,203\,959\,708\,530\,868\,486\,144\,000\,000\,000\,000\,000\,
000\,000\,000 $a^3\, x^3$ −

3\,888\,592\,310\,164\,339\,695\,070\,801\,619\,011\,112\,520\,446\,498\,677\,682\,567\,561\,191\,373\,495\,634\,066\,666\,384\,
579\,817\,039\,227\,665\,673\,188\,261\,927\,237\,413\,367\,800\,989\,927\,132\,717\,121\,536\,000\,000\,000\,000\,000\,000\,
000\,000 $a^4\, x^4$ −

777\,718\,462\,032\,867\,939\,014\,160\,323\,802\,222\,504\,089\,299\,735\,536\,513\,512\,238\,274\,699\,126\,813\,333\,276\,
915\,963\,407\,845\,533\,134\,637\,652\,385\,447\,482\,673\,560\,197\,985\,426\,543\,424\,307\,200\,000\,000\,000\,000\,000\,
000\,000 $a^5\, x^5$ −

129\,619\,743\,672\,144\,656\,502\,360\,053\,967\,037\,084\,014\,883\,289\,256\,085\,585\,373\,045\,783\,187\,802\,222\,212\,
819\,327\,234\,640\,922\,189\,106\,275\,397\,574\,580\,445\,593\,366\,330\,904\,423\,904\,051\,200\,000\,000\,000\,000\,000\,
000\,000 $a^6\, x^6$ −

18\,517\,106\,238\,877\,808\,071\,765\,721\,995\,291\,012\,002\,126\,184\,179\,440\,797\,910\,435\,111\,883\,971\,746\,030\,
402\,761\,033\,520\,131\,741\,300\,896\,485\,367\,797\,206\,513\,338\,047\,272\,060\,557\,721\,600\,000\,000\,000\,000\,000\,
000\,000 $a^7\, x^7$ −

2\,314\,638\,279\,859\,726\,008\,970\,715\,249\,411\,376\,500\,265\,773\,022\,430\,099\,738\,804\,388\,985\,496\,468\,253\,800\,
345\,129\,190\,016\,467\,662\,612\,060\,670\,974\,650\,814\,167\,255\,909\,007\,569\,715\,200\,000\,000\,000\,000\,000\,000\,
000 $a^8\, x^8$ −

257\,182\,031\,095\,525\,112\,107\,857\,249\,934\,597\,388\,918\,419\,224\,714\,455\,526\,533\,820\,998\,388\,496\,472\,644\,
482\,792\,132\,224\,051\,962\,512\,451\,185\,663\,850\,090\,463\,028\,434\,334\,174\,412\,800\,000\,000\,000\,000\,000\,000\,
000 $a^9\, x^9$ −

25 718 203 109 552 511 210 785 724 993 459 738 891 841 922 471 445 552 653 382 099 838 849 647 264
448 279 213 222 405 196 251 245 118 566 385 009 046 302 843 433 417 441 280 000 000 000 000 000 000
000 a^{10} x^{10} −

2 338 018 464 504 773 746 435 065 908 496 339 899 258 356 588 313 232 059 398 372 712 622 695 205 858
934 473 929 309 563 295 567 738 051 489 546 276 936 622 130 310 676 480 000 000 000 000 000 000 000
a^{11} x^{11} −

194 834 872 042 064 478 869 588 825 708 028 324 938 196 382 359 436 004 949 864 392 718 557 933 821
577 872 827 442 463 607 963 978 170 957 462 189 744 718 510 859 223 040 000 000 000 000 000 000 000
a^{12} x^{12} −

14 987 297 849 389 575 297 660 678 900 617 563 456 784 337 104 572 000 380 758 799 439 889 071 832
429 067 140 572 497 200 612 613 705 458 266 322 288 055 270 066 094 080 000 000 000 000 000 000 000
a^{13} x^{13} −

1 070 521 274 956 398 235 547 191 350 044 111 675 484 595 507 469 428 598 625 628 531 420 647 988 030
647 652 898 035 514 329 472 407 532 733 308 734 861 090 719 006 720 000 000 000 000 000 000 000
a^{14} x^{14} −

71 368 084 997 093 215 703 146 090 002 940 778 365 639 700 497 961 906 575 041 902 094 709 865 868
709 843 526 535 700 955 298 160 502 182 220 582 324 072 714 600 448 000 000 000 000 000 000 000
a^{15} x^{15} −

4 460 505 312 318 325 981 446 630 625 183 798 647 852 481 281 122 619 160 940 118 880 919 366 616 794
365 220 408 481 309 706 135 031 386 388 786 395 254 544 662 528 000 000 000 000 000 000 000
a^{16} x^{16} −

262 382 665 430 489 763 614 507 683 834 341 096 932 498 898 889 565 832 996 477 581 230 550 977 458
492 071 788 734 194 688 596 178 316 846 399 199 720 855 568 384 000 000 000 000 000 000 000
a^{17} x^{17} −

14 576 814 746 138 320 200 805 982 435 241 172 051 805 494 382 753 657 388 693 198 957 252 832 081
027 337 321 596 344 149 366 454 350 935 911 066 651 158 642 688 000 000 000 000 000 000 000
a^{18} x^{18} −

767 200 776 112 543 168 463 472 759 749 535 371 147 657 599 092 297 757 299 642 050 381 728 004 264
596 701 136 649 692 071 918 650 049 258 477 192 166 244 352 000 000 000 000 000 000 000 a^{19} x^{19} −

38 360 038 805 627 158 423 173 637 987 476 768 557 382 879 954 614 887 864 982 102 519 086 400 213
229 835 056 832 484 603 595 932 502 462 923 859 608 312 217 600 000 000 000 000 000 000 000 a^{20} x^{20} −

1 826 668 514 553 674 210 627 316 094 641 750 883 684 899 045 457 851 803 094 385 834 242 209 533 963
325 478 896 784 981 123 615 833 450 615 421 886 110 105 600 000 000 000 000 000 000 000 a^{21} x^{21} −

83 030 387 025 167 009 573 968 913 392 806 858 349 313 592 975 356 900 140 653 901 556 464 069 725
605 703 586 217 499 141 982 537 884 118 882 813 005 004 800 000 000 000 000 000 000 000 a^{22} x^{22} −

3 610 016 827 181 174 329 302 996 234 469 863 406 491 895 346 754 647 832 202 343 545 933 220 422 852
421 895 052 934 745 303 588 603 657 342 731 000 217 600 000 000 000 000 000 000 000 a^{23} x^{23} −

150 417 367 799 215 597 054 291 509 769 577 641 937 162 306 114 776 993 008 430 981 080 550 850 952
184 245 627 205 614 387 649 525 152 389 280 458 342 400 000 000 000 000 000 000 000 a^{24} x^{24} −

6 016 694 711 968 623 882 171 660 390 783 105 677 486 492 244 591 079 720 337 239 243 222 034 038 087
369 825 088 224 575 505 981 006 095 571 218 333 696 000 000 000 000 000 000 000 a^{25} x^{25} −

231 411 335 075 716 303 160 448 476 568 580 987 595 634 317 099 656 912 320 663 047 816 232 078 387
975 762 503 393 252 904 076 192 542 137 354 551 296 000 000 000 000 000 000 000 a^{26} x^{26} −

8 570 790 187 989 492 709 646 239 872 910 406 947 986 456 188 876 181 937 802 335 104 304 891 792 147
250 463 088 638 996 447 266 390 449 531 650 048 000 000 000 000 000 000 000 a^{27} x^{27} −

306 099 649 571 053 311 058 794 281 175 371 676 713 802 006 745 577 926 350 083 396 582 317 564 005
258 945 110 308 535 587 402 371 087 483 273 216 000 000 000 000 000 000 000 a^{28} x^{28} −

10 555 160 330 036 321 070 992 906 247 426 609 541 855 241 611 916 480 218 968 392 985 597 157 379
491 687 762 424 432 261 634 564 520 258 043 904 000 000 000 000 000 000 000 a^{29} x^{29} −

351 838 677 667 877 369 033 096 874 914 220 318 061 841 387 063 882 673 965 613 099 519 905 245 983
056 258 747 481 075 387 818 817 341 934 796 800 000 000 000 000 000 000 a^{30} x^{30} −

11 349 634 763 479 915 130 099 899 190 781 300 582 640 044 743 996 215 289 213 325 790 964 685 354 292 137 378 951 002 431 865 123 140 062 412 800 000 000 000 000 000 $a^{31} x^{31}$ −

354 676 086 358 747 347 815 621 849 711 915 643 207 501 398 249 881 727 787 916 430 967 646 417 321 629 293 092 218 825 995 785 098 126 950 400 000 000 000 000 000 $a^{32} x^{32}$ −

10 747 760 192 689 313 570 170 359 082 179 261 915 378 830 249 996 415 993 573 225 180 837 770 221 867 554 336 127 843 211 993 487 822 028 800 000 000 000 000 000 $a^{33} x^{33}$ −

316 110 593 902 626 869 710 892 914 181 742 997 511 142 066 176 365 176 281 565 446 495 228 535 937 281 009 886 113 035 646 867 288 883 200 000 000 000 000 000 $a^{34} x^{34}$ −

9 031 731 254 360 767 706 025 511 833 764 085 643 175 487 605 039 005 036 616 155 614 149 386 741 065 171 711 031 801 018 481 922 539 520 000 000 000 000 000 $a^{35} x^{35}$ −

250 881 423 732 243 547 389 597 550 937 891 267 865 985 766 806 639 028 794 893 211 504 149 631 696 254 769 750 883 361 624 497 848 320 000 000 000 000 000 $a^{36} x^{36}$ −

6 780 579 019 790 366 145 664 798 673 997 061 293 675 290 994 774 027 805 267 384 094 706 746 802 601 480 263 537 388 152 013 455 360 000 000 000 000 000 $a^{37} x^{37}$ −

178 436 289 994 483 319 622 757 859 842 027 928 780 928 710 388 790 205 401 773 265 650 177 547 436 881 059 566 773 372 421 406 720 000 000 000 000 000 $a^{38} x^{38}$ −

4 575 289 487 038 033 836 480 970 765 180 203 302 075 095 138 174 107 830 814 699 119 235 321 729 150 796 399 148 035 190 292 480 000 000 000 000 000 $a^{39} x^{39}$ −

114 382 237 175 950 845 912 024 269 129 505 082 551 877 378 454 352 695 770 367 477 980 883 043 228 769 909 978 700 879 757 312 000 000 000 000 000 $a^{40} x^{40}$ −

2 789 810 662 828 069 412 488 396 808 036 709 330 533 594 596 447 626 726 106 523 853 192 269 347 043 168 536 065 875 116 032 000 000 000 000 000 $a^{41} x^{41}$ −

66 424 063 400 668 319 344 961 828 762 778 793 584 133 204 677 324 445 859 679 139 361 720 698 739 123 060 382 520 836 096 000 000 000 000 000 $a^{42} x^{42}$ −

1 544 745 660 480 658 589 417 716 947 971 599 850 793 795 457 612 196 415 341 375 333 993 504 621 840 071 171 686 531 072 000 000 000 000 000 $a^{43} x^{43}$ −

35 107 855 920 014 967 941 311 748 817 536 360 245 313 533 127 549 918 530 485 803 045 306 923 223 637 981 174 693 888 000 000 000 000 000 $a^{44} x^{44}$ −

780 174 576 000 332 620 918 038 862 611 919 116 562 522 958 389 998 189 566 351 178 784 598 293 858 621 803 882 086 400 000 000 000 000 $a^{45} x^{45}$ −

16 960 316 869 572 448 280 826 931 795 911 285 142 663 542 573 695 612 816 659 808 234 447 788 996 926 560 953 958 400 000 000 000 000 $a^{46} x^{46}$ −

360 857 805 735 584 005 975 041 102 040 665 641 333 266 863 270 119 421 631 059 749 669 101 893 551 628 956 467 200 000 000 000 000 $a^{47} x^{47}$ −

7 517 870 952 824 666 791 146 689 625 847 200 861 109 726 318 127 487 950 647 078 118 106 289 448 992 269 926 400 000 000 000 000 $a^{48} x^{48}$ −

153 425 937 812 748 301 860 136 522 976 473 486 961 422 986 084 234 447 972 389 349 349 107 947 938 617 753 600 000 000 000 000 $a^{49} x^{49}$ −

3 068 518 756 254 966 037 202 730 459 529 469 739 228 459 721 684 688 959 447 786 986 982 158 958 772 355 072 000 000 000 000 $a^{50} x^{50}$ −

60 167 034 436 371 883 082 406 479 598 617 053 710 361 955 327 150 763 910 740 921 313 375 665 858 281 472 000 000 000 000 $a^{51} x^{51}$ −

1 157 058 354 545 613 136 200 124 607 665 712 571 353 114 525 522 130 075 206 556 179 103 378 189 582 336 000 000 000 000 $a^{52} x^{52}$ −

21 831 289 708 407 795 022 643 860 521 994 576 817 983 292 934 379 812 739 746 343 001 950 531 878 912 000 000 000 000 $a^{53} x^{53}$ −

404 283 142 748 292 500 419 330 750 407 306 978 110 801 721 007 033 569 254 561 907 443 528 368 128 000 000 000 000 $a^{54} x^{54}$ −

7 350 602 595 423 500 007 624 195 461 951 035 965 650 940 381 946 064 895 537 489 226 245 970 329 600 000 000 000 $a^{55} x^{55}$ −

131 260 760 632 562 500 136 146 347 534 839 927 958 052 506 820 465 444 563 169 450 468 678 041 600

$000\,000\,000\ a^{56}\ x^{56}\ -$

$2\,302\,820\,361\,974\,780\,704\,142\,918\,377\,804\,209\,262\,421\,973\,803\,867\,814\,816\,897\,709\,657\,345\,228\,800\,000\,$
$000\,000\ a^{57}\ x^{57}\ -$

$39\,703\,799\,344\,392\,770\,761\,084\,799\,617\,313\,952\,800\,378\,858\,687\,376\,117\,532\,719\,132\,023\,193\,600\,000\,$
$000\,000\ a^{58}\ x^{58}\ -$

$672\,945\,751\,599\,877\,470\,526\,861\,010\,462\,948\,352\,548\,794\,215\,040\,273\,178\,520\,663\,254\,630\,400\,000\,000\,000$
$a^{59}\ x^{59}\ -$

$11\,215\,762\,526\,664\,624\,508\,781\,016\,841\,049\,139\,209\,146\,570\,250\,671\,219\,642\,011\,054\,243\,840\,000\,000\,000$
$a^{60}\ x^{60}\ -$

$183\,864\,959\,453\,518\,434\,570\,180\,603\,951\,625\,232\,936\,829\,020\,502\,806\,879\,377\,230\,397\,440\,000\,000\,000$
$a^{61}\ x^{61}\ -$

$2\,965\,563\,862\,153\,523\,138\,228\,719\,418\,574\,600\,531\,239\,177\,750\,045\,272\,248\,019\,845\,120\,000\,000\,000$
$a^{62}\ x^{62}\ -$

$47\,072\,442\,256\,405\,129\,178\,233\,641\,564\,676\,198\,908\,558\,376\,984\,845\,591\,238\,410\,240\,000\,000\,000\ a^{63}\ x^{63}\ -$

$735\,506\,910\,256\,330\,143\,409\,900\,649\,448\,065\,607\,946\,224\,640\,388\,212\,363\,100\,160\,000\,000\,000\ a^{64}\ x^{64}\ -$

$11\,315\,490\,927\,020\,463\,744\,767\,702\,299\,201\,009\,353\,018\,840\,621\,357\,113\,278\,464\,000\,000\,000\ a^{65}\ x^{65}\ -$

$171\,446\,832\,227\,582\,784\,011\,631\,853\,018\,197\,111\,409\,376\,373\,050\,865\,352\,704\,000\,000\,000\ a^{66}\ x^{66}\ -$

$2\,558\,907\,943\,695\,265\,433\,009\,430\,642\,062\,643\,453\,871\,289\,150\,012\,915\,712\,000\,000\,000\ a^{67}\ x^{67}\ -$

$37\,630\,999\,171\,989\,197\,544\,256\,332\,971\,509\,462\,556\,930\,722\,794\,307\,584\,000\,000\,000\ a^{68}\ x^{68}\ -$

$545\,376\,799\,594\,046\,341\,221\,106\,274\,949\,412\,500\,825\,082\,939\,047\,936\,000\,000\,000\ a^{69}\ x^{69}\ -$

$7\,791\,097\,137\,057\,804\,874\,587\,232\,499\,277\,321\,440\,358\,327\,700\,684\,800\,000\,000\ a^{70}\ x^{70}\ -$

$109\,733\,762\,493\,771\,899\,642\,073\,697\,172\,920\,020\,286\,737\,009\,868\,800\,000\,000\ a^{71}\ x^{71}\ -$

$1\,524\,080\,034\,635\,720\,828\,362\,134\,682\,957\,222\,503\,982\,458\,470\,400\,000\,000\ a^{72}\ x^{72}\ -$

$20\,877\,808\,693\,640\,011\,347\,426\,502\,506\,263\,321\,972\,362\,444\,800\,000\,000\ a^{73}\ x^{73}\ -$

$282\,132\,549\,914\,054\,207\,397\,655\,439\,273\,828\,675\,302\,195\,200\,000\,000\ a^{74}\ x^{74}\ -$

$3\,761\,767\,332\,187\,389\,431\,968\,739\,190\,317\,715\,670\,695\,936\,000\,000\ a^{75}\ x^{75}\ -$

$49\,496\,938\,581\,413\,018\,841\,693\,936\,714\,706\,785\,140\,736\,000\,000\ a^{76}\ x^{76}\ -$

$642\,817\,384\,174\,195\,049\,892\,129\,048\,242\,945\,261\,568\,000\,000\ a^{77}\ x^{77}\ -$

$8\,241\,248\,515\,053\,782\,690\,924\,731\,387\,730\,067\,456\,000\,000\ a^{78}\ x^{78}\ -$

$104\,319\,601\,456\,376\,996\,087\,654\,827\,692\,785\,664\,000\,000\ a^{79}\ x^{79}\ -$

$1\,303\,995\,018\,204\,712\,451\,095\,685\,346\,159\,820\,800\,000\ a^{80}\ x^{80}\ -$

$16\,098\,703\,928\,453\,240\,136\,983\,769\,705\,676\,800\,000\ a^{81}\ x^{81}\ -$

$196\,325\,657\,664\,063\,904\,109\,558\,167\,142\,400\,000\ a^{82}\ x^{82}\ -$

$2\,365\,369\,369\,446\,553\,061\,560\,941\,772\,800\,000\ a^{83}\ x^{83}\ -$

$28\,159\,159\,160\,078\,012\,637\,630\,259\,200\,000\ a^{84}\ x^{84}\ -\ 331\,284\,225\,412\,682\,501\,619\,179\,520\,000\ a^{85}\ x^{85}\ -$

$3\,852\,142\,155\,961\,424\,437\,432\,320\,000\ a^{86}\ x^{86}\ -\ 44\,277\,496\,045\,533\,614\,223\,360\,000\ a^{87}\ x^{87}\ -$

$503\,153\,364\,153\,791\,070\,720\,000\ a^{88}\ x^{88}\ -\ 5\,653\,408\,585\,997\,652\,480\,000\ a^{89}\ x^{89}\ -$

$62\,815\,650\,955\,529\,472\,000\ a^{90}\ x^{90}\ -\ 690\,281\,878\,632\,192\,000\ a^{91}\ x^{91}\ -\ 7\,503\,063\,898\,176\,000\ a^{92}\ x^{92}\ -$

$80\,678\,106\,432\,000\ a^{93}\ x^{93}\ -\ 858\,277\,728\,000\ a^{94}\ x^{94}\ -\ 9\,034\,502\,400\ a^{95}\ x^{95}\ -\ 94\,109\,400\ a^{96}\ x^{96}\ -$

$970\,200\ a^{97}\ x^{97}\ -\ 9900\ a^{98}\ x^{98}\ -\ 100\ a^{99}\ x^{99}\ -\ a^{100}\ x^{100}\ +\ a^{101}\ e^{a\,x}\ x^{101}\ \text{Gamma}[0,\,a\,x]\Big)$

Problem 5: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[0,\,a\,x]}{x}\ dx$$

Optimal (type 5, 32 leaves, 1 step):

$a\,x\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-a\,x] - \text{EulerGamma}\,\text{Log}[x] - \frac{1}{2}\,\text{Log}[a\,x]^2$

Result (type 5, 66 leaves) :

```
a x HypergeometricPFQ[{1, 1, 1}, {2, 2, 2}, - a x] +
 Gamma[0, a x] Log[a x] + ExpIntegralEi[- a x] (- Log[x] + Log[a x]) +
 1
 ─ Log[x] (- 2 Gamma[0, a x] + Log[x] - 2 (EulerGamma + Log[a x]))
 2
```

Problem 8: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[0, a\, x]}{x^4}\, dx$$

Optimal (type 4, 25 leaves, 1 step) :

$$\frac{1}{3}\, a^3\, \text{Gamma}[-3, a\, x] - \frac{\text{Gamma}[0, a\, x]}{3\, x^3}$$

Result (type 4, 55 leaves) :

$$\frac{1}{18\, x^3}\, e^{-a\, x} \left(2 - a\, x + a^2\, x^2 + a^3\, e^{a\, x}\, x^3\, \text{ExpIntegralEi}[-a\, x] - 6\, e^{a\, x}\, \text{Gamma}[0, a\, x]\right)$$

Problem 17: Result more than twice size of optimal antiderivative.

$$\int x^{100}\, \text{Gamma}[2, a\, x]\, dx$$

Optimal (type 4, 25 leaves, 1 step) :

$$\frac{1}{101}\, x^{101}\, \text{Gamma}[2, a\, x] - \frac{\text{Gamma}[103, a\, x]}{101\, a^{101}}$$

Result (type 4, 839 leaves) :

$e^{-a\,x}$

$\Big(- \big(9\,519\,273\,975\,282\,303\,573\,533\,322\,363\,339\,203\,450\,053\,028\,762\,966\,925\,389\,796\,482\,317\,312\,195\,199$

$309\,451\,392\,112\,029\,325\,567\,964\,865\,197\,877\,187\,924\,376\,823\,341\,620\,891\,513\,520\,128\,000\,000\,000$

$000\,000\,000\,000\,000 \Big/ a^{101}\big) - \dfrac{1}{a^{100}}$

$9\,519\,273\,975\,282\,303\,573\,533\,322\,363\,339\,203\,450\,053\,028\,762\,966\,925\,389\,796\,482\,317\,312\,195\,199\,309$

$451\,392\,112\,029\,325\,567\,964\,865\,197\,877\,187\,924\,376\,823\,341\,620\,891\,513\,520\,128\,000\,000\,000\,000\,000$

$000\,000\,000\, x - \dfrac{1}{a^{99}}$

$4\,759\,636\,987\,641\,151\,786\,766\,661\,181\,669\,601\,725\,026\,514\,381\,483\,462\,694\,898\,241\,158\,656\,097\,599\,654$

$725\,696\,056\,014\,662\,783\,982\,432\,598\,938\,593\,962\,188\,411\,670\,810\,445\,756\,760\,064\,000\,000\,000\,000\,000$

$000\,000\,000\, x^2 - \dfrac{1}{a^{98}}$

$1\,586\,545\,662\,547\,050\,595\,588\,887\,060\,556\,533\,908\,342\,171\,460\,494\,487\,564\,966\,080\,386\,218\,699\,199\,884$

$908\,565\,352\,004\,887\,594\,660\,810\,866\,312\,864\,654\,062\,803\,890\,270\,148\,585\,586\,688\,000\,000\,000\,000\,000$

$000\,000\,000\, x^3 - \dfrac{1}{a^{97}}$

$396\,636\,415\,636\,762\,648\,897\,221\,765\,139\,133\,477\,085\,542\,865\,123\,621\,891\,241\,520\,096\,554\,674\,799\,971$

227 141 338 001 221 898 665 202 716 578 216 163 515 700 972 567 537 146 396 672 000 000 000 000 000

000 000 000 $x^4 - \dfrac{1}{a^{96}}$

79 327 283 127 352 529 779 444 353 027 826 695 417 108 573 024 724 378 248 304 019 310 934 959 994

245 428 267 600 244 379 733 040 543 315 643 232 703 140 194 513 507 429 279 334 400 000 000 000 000

000 000 000 $x^5 - \dfrac{1}{a^{95}}$

13 221 213 854 558 754 963 240 725 504 637 782 569 518 095 504 120 729 708 050 669 885 155 826 665

707 571 377 933 374 063 288 840 090 552 607 205 450 523 365 752 251 238 213 222 400 000 000 000 000

000 000 000 $x^6 - \dfrac{1}{a^{94}}$

1 888 744 836 365 536 423 320 103 643 519 683 224 216 870 786 302 961 386 864 381 412 165 118 095 101

081 625 419 053 437 612 691 441 507 515 315 064 360 480 821 750 176 887 603 200 000 000 000 000 000

000 000 $x^7 - \dfrac{1}{a^{93}}$

236 093 104 545 692 052 915 012 955 439 960 403 027 108 848 287 870 173 358 047 676 520 639 761 887

635 203 177 381 679 701 586 430 188 439 414 383 045 060 102 718 772 110 950 400 000 000 000 000 000

000 000 $x^8 - \dfrac{1}{a^{92}}$

26 232 567 171 743 561 435 001 439 493 328 933 669 678 760 920 874 463 706 449 741 835 626 640 209

737 244 797 486 853 300 176 270 020 937 712 709 227 228 900 302 085 790 105 600 000 000 000 000 000

000 000 $x^9 - \dfrac{1}{a^{91}}$

2 623 256 717 174 356 143 500 143 949 332 893 366 967 876 092 087 446 370 644 974 183 562 664 020 973

724 479 748 685 330 017 627 002 093 771 270 922 722 890 030 208 579 010 560 000 000 000 000 000 000

000 $x^{10} - \dfrac{1}{a^{90}}$

238 477 883 379 486 922 136 376 722 666 626 669 724 352 372 007 949 670 058 634 016 687 514 910 997

611 316 340 789 575 456 147 909 281 251 933 720 247 535 457 291 689 000 960 000 000 000 000 000 000

000 $x^{11} - \dfrac{1}{a^{89}}$

19 873 156 948 290 576 844 698 060 222 218 889 143 696 031 000 662 472 504 886 168 057 292 909 249

800 943 028 399 131 288 012 325 773 437 661 143 353 961 288 107 640 750 080 000 000 000 000 000 000

000 $x^{12} - \dfrac{1}{a^{88}}$

1 528 704 380 637 736 680 361 389 247 862 991 472 592 002 384 666 344 038 837 397 542 868 685 326 907

764 848 338 394 714 462 486 597 956 743 164 873 381 637 546 741 596 160 000 000 000 000 000 000 000

$x^{13} - \dfrac{1}{a^{87}}$

109 193 170 045 552 620 025 813 517 704 499 390 899 428 741 761 881 717 059 814 110 204 906 094 779

126 060 595 599 622 461 606 185 568 338 797 490 955 831 253 338 685 440 000 000 000 000 000 000 000

$x^{14} - \dfrac{1}{a^{86}}$

7 279 544 669 703 508 001 720 901 180 299 959 393 295 249 450 792 114 470 654 274 013 660 406 318 608

404 039 706 641 497 440 412 371 222 586 499 397 055 416 889 245 696 000 000 000 000 000 000 000

$x^{15} - \dfrac{1}{a^{85}}$

454 971 541 856 469 250 107 556 323 768 747 462 080 953 090 674 507 154 415 892 125 853 775 394 913

025 252 481 665 093 590 025 773 201 411 656 212 315 963 555 577 856 000 000 000 000 000 000 000

$$x^{16} - \frac{1}{a^{84}}$$

26 763 031 873 909 955 888 679 783 751 102 791 887 114 887 686 735 714 965 640 713 285 516 199 700
766 191 322 450 887 858 236 810 188 318 332 718 371 527 267 975 168 000 000 000 000 000 000 000

$$x^{17} - \frac{1}{a^{83}}$$

1 486 835 104 106 108 660 482 210 208 394 599 549 284 160 427 040 873 053 646 706 293 639 788 872 264
788 406 802 827 103 235 378 343 795 462 928 798 418 181 554 176 000 000 000 000 000 000 000 $x^{18} -$
$$\frac{1}{a^{82}}$$

78 254 479 163 479 403 183 274 221 494 452 607 857 061 075 107 414 371 244 563 489 138 936 256 434
988 863 515 938 268 591 335 702 305 024 364 673 600 956 923 904 000 000 000 000 000 000 000 $x^{19} -$
$$\frac{1}{a^{81}}$$

3 912 723 958 173 970 159 163 711 074 722 630 392 853 053 755 370 718 562 228 174 456 946 812 821 749
443 175 796 913 429 566 785 115 251 218 233 680 047 846 195 200 000 000 000 000 000 000 $x^{20} - \frac{1}{a^{80}}$

186 320 188 484 474 769 483 986 241 653 458 590 135 859 702 636 700 883 915 627 355 092 705 372 464
259 198 847 472 068 074 608 815 011 962 773 032 383 230 771 200 000 000 000 000 000 000 $x^{21} - \frac{1}{a^{79}}$

8 469 099 476 567 034 976 544 829 166 066 299 551 629 986 483 486 403 814 346 697 958 759 335 112 011
781 765 794 184 912 482 218 864 180 126 046 926 510 489 600 000 000 000 000 000 000 $x^{22} - \frac{1}{a^{78}}$

368 221 716 372 479 781 588 905 615 915 926 067 462 173 325 368 974 078 884 639 041 685 188 483 130
947 033 295 399 344 020 966 037 573 048 958 562 022 195 200 000 000 000 000 000 000 $x^{23} - \frac{1}{a^{77}}$

15 342 571 515 519 990 899 537 733 996 496 919 477 590 555 223 707 253 286 859 960 070 216 186 797
122 793 053 974 972 667 540 251 565 543 706 606 750 924 800 000 000 000 000 000 000 $x^{24} - \frac{1}{a^{76}}$

613 702 860 620 799 635 981 509 359 859 876 779 103 622 208 948 290 131 474 398 402 808 647 471 884
911 722 158 998 906 701 610 062 621 748 264 270 036 992 000 000 000 000 000 000 $x^{25} - \frac{1}{a^{75}}$

23 603 956 177 723 062 922 365 744 609 995 260 734 754 700 344 165 005 056 707 630 877 255 671 995
573 527 775 346 111 796 215 771 639 298 010 164 232 192 000 000 000 000 000 000 $x^{26} - \frac{1}{a^{74}}$

874 220 599 174 928 256 383 916 467 036 861 508 694 618 531 265 370 557 655 838 180 639 098 962 799
019 547 235 041 177 637 621 171 825 852 228 304 896 000 000 000 000 000 000 $x^{27} - \frac{1}{a^{73}}$

31 222 164 256 247 437 727 997 016 679 887 911 024 807 804 688 048 948 487 708 506 451 396 391 528
536 412 401 251 470 629 915 041 850 923 293 868 032 000 000 000 000 000 000 $x^{28} - \frac{1}{a^{72}}$

1 076 626 353 663 704 749 241 276 437 237 514 173 269 234 644 415 480 982 334 776 084 530 910 052 708
152 151 767 292 090 686 725 581 066 320 478 208 000 000 000 000 000 000 $x^{29} - \frac{1}{a^{71}}$

35 887 545 122 123 491 641 375 881 241 250 472 442 307 821 480 516 032 744 492 536 151 030 335 090
271 738 392 243 069 689 557 519 368 877 349 273 600 000 000 000 000 000 $x^{30} - \frac{1}{a^{70}}$

1 157 662 745 874 951 343 270 189 717 459 692 659 429 284 563 887 613 959 499 759 230 678 397 906 137

$798\,012\,653\,002\,248\,050\,242\,560\,286\,366\,105\,600\,000\,000\,000\,000\,000\,x^{31} - \dfrac{1}{a^{69}}$

$36\,176\,960\,808\,592\,229\,477\,193\,428\,670\,615\,395\,607\,165\,142\,621\,487\,936\,234\,367\,475\,958\,699\,934\,566\,806\,187\,895\,406\,320\,251\,570\,080\,008\,948\,940\,800\,000\,000\,000\,000\,000\,x^{32} - \dfrac{1}{a^{68}}$

$1\,096\,271\,539\,654\,309\,984\,157\,376\,626\,382\,284\,715\,368\,640\,685\,499\,634\,431\,344\,468\,968\,445\,452\,562\,630\,490\,542\,285\,040\,007\,623\,335\,757\,846\,937\,600\,000\,000\,000\,000\,000\,x^{33} - \dfrac{1}{a^{67}}$

$32\,243\,280\,578\,067\,940\,710\,511\,077\,246\,537\,785\,746\,136\,490\,749\,989\,247\,980\,719\,675\,542\,513\,310\,665\,602\,663\,008\,383\,529\,635\,980\,463\,466\,086\,400\,000\,000\,000\,000\,000\,x^{34} - \dfrac{1}{a^{66}}$

$921\,236\,587\,944\,798\,306\,014\,602\,207\,043\,936\,735\,603\,899\,735\,713\,978\,513\,734\,847\,872\,643\,237\,447\,588\,647\,514\,525\,243\,703\,885\,156\,099\,031\,040\,000\,000\,000\,000\,000\,x^{35} - \dfrac{1}{a^{65}}$

$25\,589\,905\,220\,688\,841\,833\,738\,950\,195\,664\,909\,322\,330\,548\,214\,277\,180\,937\,079\,107\,573\,423\,262\,433\,017\,986\,514\,590\,102\,885\,698\,780\,528\,640\,000\,000\,000\,000\,000\,x^{36} - \dfrac{1}{a^{64}}$

$691\,619\,060\,018\,617\,346\,857\,809\,464\,747\,700\,251\,954\,879\,681\,466\,950\,836\,137\,273\,177\,660\,088\,173\,865\,350\,986\,880\,813\,591\,505\,372\,446\,720\,000\,000\,000\,000\,000\,x^{37} - \dfrac{1}{a^{63}}$

$18\,200\,501\,579\,437\,298\,601\,521\,301\,703\,886\,848\,735\,654\,728\,459\,656\,600\,950\,980\,873\,096\,318\,109\,838\,561\,868\,075\,810\,883\,986\,983\,485\,440\,000\,000\,000\,000\,000\,x^{38} - \dfrac{1}{a^{62}}$

$466\,679\,527\,677\,879\,451\,321\,059\,018\,048\,380\,736\,811\,659\,704\,093\,758\,998\,743\,099\,310\,162\,002\,816\,373\,381\,232\,713\,099\,589\,409\,832\,960\,000\,000\,000\,000\,000\,x^{39} - \dfrac{1}{a^{61}}$

$11\,666\,988\,191\,946\,986\,283\,026\,475\,451\,209\,518\,420\,291\,492\,602\,343\,974\,968\,577\,482\,754\,050\,070\,409\,334\,530\,817\,827\,489\,735\,245\,824\,000\,000\,000\,000\,000\,x^{40} - \dfrac{1}{a^{60}}$

$284\,560\,687\,608\,463\,080\,073\,816\,474\,419\,744\,351\,714\,426\,648\,837\,657\,926\,062\,865\,433\,025\,611\,473\,398\,403\,190\,678\,719\,261\,835\,264\,000\,000\,000\,000\,000\,x^{41} - \dfrac{1}{a^{59}}$

$6\,775\,254\,466\,868\,168\,573\,186\,106\,533\,803\,436\,945\,581\,586\,877\,087\,093\,477\,687\,272\,214\,895\,511\,271\,390\,552\,159\,017\,125\,281\,792\,000\,000\,000\,000\,000\,x^{42} - \dfrac{1}{a^{58}}$

$157\,564\,057\,369\,027\,176\,120\,607\,128\,693\,103\,184\,780\,967\,136\,676\,444\,034\,364\,820\,284\,067\,337\,471\,427\,687\,259\,512\,026\,169\,344\,000\,000\,000\,000\,000\,x^{43} - \dfrac{1}{a^{57}}$

$3\,581\,001\,303\,841\,526\,730\,013\,798\,379\,388\,708\,745\,021\,980\,379\,010\,091\,690\,109\,551\,910\,621\,306\,168\,811\,074\,079\,818\,776\,576\,000\,000\,000\,000\,000\,x^{44} - \dfrac{1}{a^{56}}$

$79\,577\,806\,752\,033\,927\,333\,639\,963\,986\,415\,749\,889\,377\,341\,755\,779\,815\,335\,767\,820\,236\,029\,025\,973\,579\,423\,995\,972\,812\,800\,000\,000\,000\,000\,x^{45} - \dfrac{1}{a^{55}}$

$1\,729\,952\,320\,696\,389\,724\,644\,347\,043\,182\,951\,084\,551\,681\,342\,516\,952\,507\,299\,300\,439\,913\,674\,477\,686\,509\,217\,303\,756\,800\,000\,000\,000\,000\,x^{46} - \dfrac{1}{a^{54}}$

$36\,807\,496\,185\,029\,568\,609\,454\,192\,408\,147\,895\,415\,993\,220\,053\,552\,181\,006\,368\,094\,466\,248\,393\,142$

$$266\,153\,559\,654\,400\,000\,000\,000\,000\,x^{47} - \frac{1}{a^{53}}$$

$$766\,822\,837\,188\,116\,012\,696\,962\,341\,836\,414\,487\,833\,192\,084\,449\,003\,770\,966\,001\,968\,046\,841\,523\,797\,\backslash$$
$$211\,532\,492\,800\,000\,000\,000\,000\,x^{48} - \frac{1}{a^{52}}$$

$$15\,649\,445\,656\,900\,326\,789\,733\,925\,343\,600\,295\,670\,065\,144\,580\,591\,913\,693\,183\,713\,633\,609\,010\,689\,\backslash$$
$$739\,010\,867\,200\,000\,000\,000\,000\,x^{49} - \frac{1}{a^{51}}$$

$$312\,988\,913\,138\,006\,535\,794\,678\,506\,872\,005\,913\,401\,302\,891\,611\,838\,273\,863\,674\,272\,672\,180\,213\,794\,\backslash$$
$$780\,217\,344\,000\,000\,000\,000\,x^{50} - \frac{1}{a^{50}}$$

$$6\,137\,037\,512\,509\,932\,074\,405\,460\,919\,058\,939\,478\,456\,919\,443\,369\,377\,918\,895\,573\,973\,964\,317\,917\,544\,\backslash$$
$$710\,144\,000\,000\,000\,000\,x^{51} - \frac{1}{a^{49}}$$

$$118\,019\,952\,163\,652\,539\,892\,412\,709\,981\,902\,682\,278\,017\,681\,603\,257\,267\,671\,068\,730\,268\,544\,575\,337\,\backslash$$
$$398\,272\,000\,000\,000\,000\,x^{52} - \frac{1}{a^{48}}$$

$$2\,226\,791\,550\,257\,595\,092\,309\,673\,773\,243\,446\,835\,434\,295\,879\,306\,740\,899\,454\,126\,986\,198\,954\,251\,649\,\backslash$$
$$024\,000\,000\,000\,000\,x^{53} - \frac{1}{a^{47}}$$

$$41\,236\,880\,560\,325\,835\,042\,771\,736\,541\,545\,311\,767\,301\,775\,542\,717\,424\,063\,965\,314\,559\,239\,893\,549\,\backslash$$
$$056\,000\,000\,000\,000\,x^{54} - \frac{1}{a^{46}}$$

$$749\,761\,464\,733\,197\,000\,777\,667\,937\,119\,005\,668\,496\,395\,918\,958\,498\,619\,344\,823\,901\,077\,088\,973\,619\,\backslash$$
$$200\,000\,000\,000\,x^{55} - \frac{1}{a^{45}}$$

$$13\,388\,597\,584\,521\,375\,013\,886\,927\,448\,553\,672\,651\,721\,355\,695\,687\,475\,345\,443\,283\,947\,805\,160\,243\,\backslash$$
$$200\,000\,000\,000\,x^{56} - \frac{1}{a^{44}}$$

$$234\,887\,676\,921\,427\,631\,822\,577\,674\,536\,029\,344\,767\,041\,327\,994\,517\,111\,323\,566\,385\,049\,213\,337\,600\,\backslash$$
$$000\,000\,000\,x^{57} - \frac{1}{a^{43}}$$

$$4\,049\,787\,533\,128\,062\,617\,630\,649\,560\,966\,023\,185\,638\,643\,586\,112\,363\,988\,337\,351\,466\,365\,747\,200\,000\,\backslash$$
$$000\,000\,x^{58} - \frac{1}{a^{42}}$$

$$68\,640\,466\,663\,187\,501\,993\,739\,823\,067\,220\,731\,959\,977\,009\,934\,107\,864\,209\,107\,651\,972\,300\,800\,000\,\backslash$$
$$000\,000\,x^{59} - \frac{1}{a^{41}}$$

$$1\,144\,007\,777\,719\,791\,699\,895\,663\,717\,787\,012\,199\,332\,950\,165\,568\,464\,403\,485\,127\,532\,871\,680\,000\,000\,\backslash$$
$$000\,x^{60} - \frac{1}{a^{40}}$$

$$18\,754\,225\,864\,258\,880\,326\,158\,421\,603\,065\,773\,759\,556\,560\,091\,286\,301\,696\,477\,500\,538\,880\,000\,000\,000$$
$$x^{61} - \frac{1}{a^{39}}$$

$$302\,487\,513\,939\,659\,360\,099\,329\,380\,694\,609\,254\,186\,396\,130\,504\,617\,769\,298\,024\,202\,240\,000\,000\,000$$
$$x^{62} - \frac{1}{a^{38}}$$

$$4\,801\,389\,110\,153\,323\,176\,179\,831\,439\,596\,972\,288\,672\,954\,452\,454\,250\,306\,317\,844\,480\,000\,000\,000\,x^{63} -$$

$$\frac{1}{a^{37}}75\,021\,704\,846\,145\,674\,627\,809\,866\,243\,702\,692\,010\,514\,913\,319\,597\,661\,036\,216\,320\,000\,000\,000\,x^{64}-$$

$$\frac{1}{a^{36}}1\,154\,180\,074\,556\,087\,301\,966\,305\,634\,518\,502\,954\,007\,921\,743\,378\,425\,554\,403\,328\,000\,000\,000\,x^{65}-$$

$$\frac{1}{a^{35}}17\,487\,576\,887\,213\,443\,969\,186\,449\,007\,856\,105\,363\,756\,390\,051\,188\,265\,975\,808\,000\,000\,000\,x^{66}-$$

$$\frac{1}{a^{34}}261\,008\,610\,256\,917\,074\,166\,961\,925\,490\,389\,632\,294\,871\,493\,301\,317\,402\,624\,000\,000\,000\,x^{67}-$$

$$\frac{1}{a^{33}}3\,838\,361\,915\,542\,898\,149\,514\,145\,963\,093\,965\,180\,806\,933\,725\,019\,373\,568\,000\,000\,000\,x^{68}-$$

$$\frac{1}{a^{32}}55\,628\,433\,558\,592\,726\,804\,552\,840\,044\,840\,075\,084\,158\,459\,782\,889\,472\,000\,000\,000\,x^{69}-$$

$$\frac{1}{a^{31}}794\,691\,907\,979\,896\,097\,207\,897\,714\,926\,286\,786\,916\,549\,425\,469\,849\,600\,000\,000\,x^{70}-$$

$$\frac{1}{a^{30}}11\,192\,843\,774\,364\,733\,763\,491\,517\,111\,637\,842\,069\,247\,175\,006\,617\,600\,000\,000\,x^{71}-$$

$$\frac{1}{a^{29}}155\,456\,163\,532\,843\,524\,492\,937\,737\,661\,636\,695\,406\,210\,763\,980\,800\,000\,000\,x^{72}-$$

$$\frac{1}{a^{28}}2\,129\,536\,486\,751\,281\,157\,437\,503\,255\,638\,858\,841\,180\,969\,369\,600\,000\,000\,x^{73}-$$

$$\frac{1}{a^{27}}28\,777\,520\,091\,233\,529\,154\,560\,854\,805\,930\,524\,880\,823\,910\,400\,000\,000\,x^{74}-$$

$$\frac{383\,700\,267\,883\,113\,722\,060\,811\,397\,412\,406\,998\,410\,985\,472\,000\,000\,x^{75}}{a^{26}}-$$

$$\frac{5\,048\,687\,735\,304\,127\,921\,852\,781\,544\,900\,092\,084\,355\,072\,000\,000\,x^{76}}{a^{25}}-$$

$$\frac{65\,567\,373\,185\,767\,895\,088\,997\,162\,920\,780\,416\,679\,936\,000\,000\,x^{77}}{a^{24}}-$$

$$\frac{840\,607\,348\,535\,485\,834\,474\,322\,601\,548\,466\,880\,512\,000\,000\,x^{78}}{a^{23}}-$$

$$\frac{10\,640\,599\,348\,550\,453\,600\,940\,792\,424\,664\,137\,728\,000\,000\,x^{79}}{a^{22}}-$$

$$\frac{133\,007\,491\,856\,880\,670\,011\,759\,905\,308\,301\,721\,600\,000\,x^{80}}{a^{21}}-$$

$$\frac{1\,642\,067\,800\,702\,230\,493\,972\,344\,509\,979\,033\,600\,000\,x^{81}}{a^{20}}-$$

$$\frac{20\,025\,217\,081\,734\,518\,219\,174\,933\,048\,524\,800\,000\,x^{82}}{a^{19}}-$$

$$\frac{241\,267\,675\,683\,548\,412\,279\,216\,060\,825\,600\,000\,x^{83}}{a^{18}}-$$

$$\frac{2\,872\,234\,234\,327\,957\,289\,038\,286\,438\,400\,000\,x^{84}}{a^{17}}-\frac{33\,790\,990\,992\,093\,615\,165\,156\,311\,040\,000\,x^{85}}{a^{16}}-$$

$$\frac{392\,918\,499\,908\,065\,292\,618\,096\,640\,000\,x^{86}}{a^{15}}-\frac{4\,516\,304\,596\,644\,428\,650\,782\,720\,000\,x^{87}}{a^{14}}-$$

$$\frac{51\,321\,643\,143\,686\,689\,213\,440\,000\,x^{88}}{a^{13}} - \frac{576\,647\,675\,771\,760\,552\,960\,000\,x^{89}}{a^{12}} -$$

$$\frac{6\,407\,196\,397\,464\,006\,144\,000\,x^{90}}{a^{11}} - \frac{70\,408\,751\,620\,483\,584\,000\,x^{91}}{a^{10}} - \frac{765\,312\,517\,613\,952\,000\,x^{92}}{a^{9}} -$$

$$\frac{8\,229\,166\,856\,064\,000\,x^{93}}{a^{8}} - \frac{87\,544\,328\,256\,000\,x^{94}}{a^{7}} - \frac{921\,519\,244\,800\,x^{95}}{a^{6}} - \frac{9\,599\,158\,800\,x^{96}}{a^{5}} -$$

$$\frac{98\,960\,400\,x^{97}}{a^{4}} - \frac{1\,009\,800\,x^{98}}{a^{3}} - \frac{10\,200\,x^{99}}{a^{2}} - \frac{102\,x^{100}}{a} - \frac{102\,x^{101}}{101} - \frac{a\,x^{102}}{101} \Bigg) + \frac{1}{101}\,x^{101}\,\text{Gamma}[2,\,a\,x]$$

Problem 18: Result more than twice size of optimal antiderivative.

$$\int x^2\,\text{Gamma}[2,\,a\,x]\,\mathrm{d}x$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{3}\,x^3\,\text{Gamma}[2,\,a\,x] - \frac{\text{Gamma}[5,\,a\,x]}{3\,a^3}$$

Result (type 4, 55 leaves):

$$\mathbb{e}^{-a\,x}\left(-\frac{8}{a^3} - \frac{8\,x}{a^2} - \frac{4\,x^2}{a} - \frac{4\,x^3}{3} - \frac{a\,x^4}{3}\right) + \frac{1}{3}\,x^3\,\text{Gamma}[2,\,a\,x]$$

Problem 21: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[2,\,a\,x]}{x}\,\mathrm{d}x$$

Optimal (type 4, 14 leaves, 2 steps):

$$-\mathbb{e}^{-a\,x} + \text{ExpIntegralEi}[-a\,x]$$

Result (type 4, 41 leaves):

$$-\mathbb{e}^{-a\,x} + \text{ExpIntegralEi}[-a\,x] - \mathbb{e}^{-a\,x}\,(1+a\,x)\,\text{Log}[a\,x] + \text{Gamma}[2,\,a\,x]\,\text{Log}[a\,x]$$

Problem 25: Result more than twice size of optimal antiderivative.

$$\int x^{100}\,\text{Gamma}[3,\,a\,x]\,\mathrm{d}x$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{101}\,x^{101}\,\text{Gamma}[3,\,a\,x] - \frac{\text{Gamma}[104,\,a\,x]}{101\,a^{101}}$$

Result (type 4, 846 leaves):

$$\frac{1}{101}\Bigg(-\frac{1}{a^{101}}\,\mathbb{e}^{-a\,x}$$

$$\Big(99\,029\,007\,164\,861\,804\,075\,467\,152\,545\,817\,733\,490\,901\,658\,221\,144\,924\,830\,052\,805\,546\,998\,766\,$$

$$658\,416\,222\,832\,141\,441\,073\,883\,538\,492\,653\,516\,385\,977\,292\,093\,222\,882\,134\,415\,149\,891\,584\,000\,$$

000 000 000 000 000 000 000 +

99 029 007 164 861 804 075 467 152 545 817 733 490 901 658 221 144 924 830 052 805 546 998 766 ⸜
658 416 222 832 141 441 073 883 538 492 653 516 385 977 292 093 222 882 134 415 149 891 584 ⸜
000 000 000 000 000 000 000 000 a x +

49 514 503 582 430 902 037 733 576 272 908 866 745 450 829 110 572 462 415 026 402 773 499 383 ⸜
329 208 111 416 070 720 536 941 769 246 326 758 192 988 646 046 611 441 067 207 574 945 792 ⸜
000 000 000 000 000 000 000 000 $a^2 x^2$ +

16 504 834 527 476 967 345 911 192 090 969 622 248 483 609 703 524 154 138 342 134 257 833 127 ⸜
776 402 703 805 356 906 845 647 256 415 442 252 730 996 215 348 870 480 355 735 858 315 264 ⸜
000 000 000 000 000 000 000 000 $a^3 x^3$ +

4 126 208 631 869 241 836 477 798 022 742 405 562 120 902 425 881 038 534 585 533 564 458 281 ⸜
944 100 675 951 339 226 711 411 814 103 860 563 182 749 053 837 217 620 088 933 964 578 816 ⸜
000 000 000 000 000 000 000 000 $a^4 x^4$ +

825 241 726 373 848 367 295 559 604 548 481 112 424 180 485 176 207 706 917 106 712 891 656 388 ⸜
820 135 190 267 845 342 282 362 820 772 112 636 549 810 767 443 524 017 786 792 915 763 200 ⸜
000 000 000 000 000 000 000 000 $a^5 x^5$ +

137 540 287 728 974 727 882 593 267 424 746 852 070 696 747 529 367 951 152 851 118 815 276 064 ⸜
803 355 865 044 640 890 380 393 803 462 018 772 758 301 794 573 920 669 631 132 152 627 200 ⸜
000 000 000 000 000 000 000 000 $a^6 x^6$ +

19 648 612 532 710 675 411 799 038 203 535 264 581 528 106 789 909 707 307 550 159 830 753 723 ⸜
543 336 552 149 234 412 911 484 829 066 002 681 822 614 542 081 988 667 090 161 736 089 600 ⸜
000 000 000 000 000 000 000 000 $a^7 x^7$ +

2 456 076 566 588 834 426 474 879 775 441 908 072 691 013 348 738 713 413 443 769 978 844 215 ⸜
442 917 069 018 654 301 613 935 603 633 250 335 227 826 817 760 248 583 386 270 217 011 200 ⸜
000 000 000 000 000 000 000 000 $a^8 x^8$ +

272 897 396 287 648 269 608 319 975 049 100 896 965 668 149 859 857 045 938 196 664 316 023 938 ⸜
101 896 557 628 255 734 881 733 737 027 815 025 314 090 862 249 842 598 474 468 556 800 000 ⸜
000 000 000 000 000 000 000 $a^9 x^9$ +

27 289 739 628 764 826 960 831 997 504 910 089 696 566 814 985 985 704 593 819 666 431 602 393 ⸜
810 189 655 762 825 573 488 173 373 702 781 502 531 409 086 224 984 259 847 446 855 680 000 ⸜
000 000 000 000 000 000 000 $a^{10} x^{10}$ +

2 480 885 420 796 802 450 984 727 045 900 917 245 142 437 725 998 700 417 619 969 675 600 217 ⸜
619 108 150 523 893 233 953 470 306 700 252 863 866 491 735 111 362 205 440 676 986 880 000 ⸜
000 000 000 000 000 000 000 $a^{11} x^{11}$ +

206 740 451 733 066 870 915 393 920 491 743 103 761 869 810 499 891 701 468 330 806 300 018 134 ⸜
925 679 210 324 436 162 789 192 225 021 071 988 874 311 259 280 183 786 723 082 240 000 000 ⸜
000 000 000 000 000 $a^{12} x^{12}$ +

15 903 111 671 774 374 685 799 532 345 518 700 289 374 600 807 683 977 036 025 446 638 462 933 ⸜
455 821 477 717 264 320 214 553 248 078 543 999 144 177 789 175 398 752 824 852 480 000 000 ⸜
000 000 000 000 000 $a^{13} x^{13}$ +

1 135 936 547 983 883 906 128 538 024 679 907 163 526 757 200 548 855 502 573 246 188 461 638 ⸜
103 987 248 408 376 022 872 468 089 148 467 428 510 298 413 512 528 482 344 632 320 000 000 ⸜
000 000 000 000 000 $a^{14} x^{14}$ +

75 729 103 198 925 593 741 902 534 978 660 477 568 450 480 036 590 366 838 216 412 564 109 206 ⸜
932 483 227 225 068 191 497 872 609 897 828 567 353 227 567 501 898 822 975 488 000 000 000 ⸜
000 000 000 000 $a^{15} x^{15}$ +

4 733 068 949 932 849 608 868 908 436 166 279 848 028 155 002 286 897 927 388 525 785 256 825 ⸜
433 280 201 701 566 761 968 617 038 118 614 285 459 576 722 968 868 676 435 968 000 000 000 ⸜
000 000 000 000 $a^{16} x^{16}$ +

278 415 820 584 285 271 109 935 790 362 722 344 001 656 176 605 111 642 787 560 340 309 225 025 ⸜
487 070 688 327 456 586 389 237 536 389 075 615 269 218 998 168 745 672 704 000 000 000 000 ⸜

000 000 000 $a^{17} x^{17}$ +

15 467 545 588 015 848 394 996 432 797 929 019 111 203 120 922 506 202 377 086 685 572 734 723 ⸜
638 170 593 795 969 810 354 957 640 910 504 200 848 289 944 342 708 092 928 000 000 000 000 ⸜
000 000 000 $a^{18} x^{18}$ +

814 081 346 737 676 231 315 601 726 206 790 479 537 006 364 342 431 704 057 193 977 512 353 875 ⸜
693 189 147 156 305 808 155 665 311 079 168 465 699 470 754 879 373 312 000 000 000 000 000 ⸜
000 000 $a^{19} x^{19}$ +

40 704 067 336 883 811 565 780 086 310 339 523 976 850 318 217 121 585 202 859 698 875 617 693 ⸜
784 659 457 357 815 290 407 783 265 553 958 423 284 973 537 743 968 665 600 000 000 000 000 ⸜
000 000 $a^{20} x^{20}$ +

1 938 288 920 803 991 026 941 908 871 920 929 713 183 348 486 529 599 295 374 271 375 029 413 ⸜
989 745 688 445 610 251 924 180 155 502 569 448 727 855 882 749 712 793 600 000 000 000 000 ⸜
000 000 $a^{21} x^{21}$ +

88 104 041 854 726 864 860 995 857 814 587 714 235 606 749 387 709 058 880 648 698 864 973 363 ⸜
170 258 565 709 556 905 644 552 522 844 065 851 266 176 488 623 308 800 000 000 000 000 000 000
$a^{22} x^{22}$ +

3 830 610 515 422 907 167 869 385 122 373 378 879 808 989 103 813 437 342 636 899 950 651 015 ⸜
790 011 241 987 372 039 375 850 109 688 872 428 315 920 716 896 665 600 000 000 000 000 000 000
$a^{23} x^{23}$ +

159 608 771 475 954 465 327 891 046 765 557 453 325 374 545 992 226 555 943 204 164 610 458 991 ⸜
250 468 416 140 501 640 660 421 237 036 351 179 830 029 870 694 400 000 000 000 000 000 000
$a^{24} x^{24}$ +

6 384 350 859 038 178 613 115 641 870 622 298 133 014 981 839 689 062 237 728 166 584 418 359 ⸜
650 018 736 645 620 065 626 416 849 481 454 047 193 201 194 827 776 000 000 000 000 000 000
$a^{25} x^{25}$ +

245 551 956 116 853 023 581 370 841 177 780 697 423 653 147 680 348 547 604 929 484 016 090 755 ⸜
769 951 409 446 925 601 016 032 672 363 617 199 738 507 493 376 000 000 000 000 000 000
$a^{26} x^{26}$ +

9 094 516 893 216 778 651 161 883 006 584 470 274 950 116 580 753 649 911 293 684 593 188 546 ⸜
509 998 200 349 886 133 370 964 173 050 504 340 731 055 833 088 000 000 000 000 000 000
$a^{27} x^{27}$ +

324 804 174 757 742 094 684 352 964 520 873 938 391 075 592 169 773 211 117 631 592 613 876 661 ⸜
071 364 298 210 219 048 963 006 180 375 155 026 109 136 896 000 000 000 000 000 000
$a^{28} x^{28}$ +

11 200 143 957 163 520 506 356 998 776 581 859 944 519 848 005 854 248 659 228 675 607 375 057 ⸜
278 322 906 834 835 139 619 414 006 219 832 931 934 797 824 000 000 000 000 000 000
$a^{29} x^{29}$ +

373 338 131 905 450 683 545 233 292 552 728 664 817 328 266 861 808 288 640 955 853 579 168 575 ⸜
944 096 894 494 504 653 980 466 873 994 431 064 493 260 800 000 000 000 000 000
$a^{30} x^{30}$ +

12 043 165 545 337 118 824 039 783 630 733 182 736 042 847 318 122 848 020 675 995 276 747 373 ⸜
417 551 512 725 629 182 386 466 673 354 659 066 596 556 800 000 000 000 000 000
$a^{31} x^{31}$ +

376 348 923 291 784 963 251 243 238 460 411 960 501 338 978 691 339 000 646 124 852 398 355 419 ⸜
298 484 772 675 911 949 577 083 542 333 095 831 142 400 000 000 000 000 000 $a^{32} x^{32}$ +

11 404 512 827 023 786 765 189 189 044 254 907 893 979 969 051 252 696 989 276 510 678 738 043 ⸜
009 044 993 111 391 271 199 305 561 888 881 691 852 800 000 000 000 000 000 $a^{33} x^{33}$ +

335 426 847 853 640 787 211 446 736 595 732 585 117 057 913 272 138 146 743 426 784 668 765 970 ⸜
854 264 503 276 213 858 803 104 761 437 696 819 200 000 000 000 000 000 $a^{34} x^{34}$ +

9 583 624 224 389 736 777 469 906 759 878 073 860 487 368 950 632 518 478 383 622 419 107 599 ⸜
167 264 700 093 606 110 251 517 278 898 219 909 120 000 000 000 000 000 $a^{35} x^{35}$ +

$266\,211\,784\,010\,826\,021\,596\,386\,298\,885\,502\,051\,680\,204\,693\,073\,125\,513\,288\,433\,956\,086\,322\,199\,090\,686\,113\,711\,280\,840\,319\,924\,413\,839\,441\,920\,000\,000\,000\,000\,000\, a^{36}\, x^{36}\, +$

$7\,194\,913\,081\,373\,676\,259\,361\,791\,861\,770\,325\,721\,086\,613\,326\,300\,689\,548\,336\,052\,867\,197\,897\,272\,721\,246\,316\,521\,103\,792\,430\,389\,563\,228\,160\,000\,000\,000\,000\,000\, a^{37}\, x^{37}\, +$

$189\,339\,817\,930\,886\,217\,351\,626\,101\,625\,534\,887\,397\,016\,140\,165\,807\,619\,693\,054\,022\,820\,997\,296\,650\,559\,113\,592\,660\,626\,116\,589\,199\,032\,320\,000\,000\,000\,000\,000\, a^{38}\, x^{38}\, +$

$4\,854\,867\,126\,432\,979\,932\,092\,976\,964\,757\,304\,805\,051\,695\,901\,687\,374\,863\,924\,462\,123\,615\,315\,298\,732\,284\,963\,914\,375\,028\,630\,492\,282\,880\,000\,000\,000\,000\,000\, a^{39}\, x^{39}\, +$

$121\,371\,678\,160\,824\,498\,302\,324\,424\,118\,932\,620\,126\,292\,397\,542\,184\,371\,598\,111\,553\,090\,382\,882\,468\,307\,124\,097\,859\,375\,715\,762\,307\,072\,000\,000\,000\,000\,000\, a^{40}\, x^{40}\, +$

$2\,960\,284\,833\,190\,841\,422\,007\,912\,783\,388\,600\,490\,885\,180\,427\,858\,155\,404\,831\,989\,099\,765\,436\,157\,763\,588\,392\,630\,716\,480\,872\,251\,392\,000\,000\,000\,000\,000\, a^{41}\, x^{41}\, +$

$70\,482\,972\,218\,829\,557\,666\,855\,066\,271\,157\,154\,544\,885\,248\,282\,337\,033\,448\,380\,692\,851\,558\,003\,756\,275\,914\,110\,255\,154\,306\,482\,176\,000\,000\,000\,000\,000\, a^{42}\, x^{42}\, +$

$1\,639\,138\,888\,809\,989\,713\,182\,675\,959\,794\,352\,431\,276\,401\,122\,845\,047\,289\,497\,225\,415\,152\,511\,715\,262\,230\,560\,703\,608\,239\,685\,632\,000\,000\,000\,000\,000\, a^{43}\, x^{43}\, +$

$37\,253\,156\,563\,863\,402\,572\,333\,544\,540\,780\,737\,074\,463\,661\,882\,841\,983\,852\,209\,668\,526\,193\,448\,074\,141\,603\,652\,354\,732\,720\,128\,000\,000\,000\,000\,000\, a^{44}\, x^{44}\, +$

$827\,847\,923\,641\,408\,946\,051\,856\,545\,350\,683\,046\,099\,192\,486\,285\,377\,418\,937\,992\,633\,915\,409\,957\,203\,146\,747\,830\,105\,171\,558\,400\,000\,000\,000\,000\, a^{45}\, x^{45}\, +$

$17\,996\,693\,992\,204\,542\,305\,475\,142\,290\,232\,240\,132\,591\,141\,006\,203\,856\,933\,434\,622\,476\,421\,955\,591\,372\,755\,387\,610\,981\,990\,400\,000\,000\,000\,000\, a^{46}\, x^{46}\, +$

$382\,908\,382\,812\,862\,602\,244\,151\,963\,621\,962\,556\,012\,577\,468\,217\,103\,339\,009\,247\,286\,732\,382\,033\,858\,994\,795\,481\,084\,723\,200\,000\,000\,000\,000\, a^{47}\, x^{47}\, +$

$7\,977\,257\,975\,267\,970\,880\,086\,499\,242\,124\,219\,916\,928\,697\,254\,522\,986\,229\,359\,318\,473\,591\,292\,372\,062\,391\,572\,522\,598\,400\,000\,000\,000\,000\, a^{48}\, x^{48}\, +$

$162\,801\,183\,168\,734\,099\,593\,602\,025\,349\,473\,875\,855\,687\,699\,071\,897\,678\,150\,190\,172\,930\,434\,538\,205\,354\,930\,051\,481\,600\,000\,000\,000\,000\, a^{49}\, x^{49}\, +$

$3\,256\,023\,663\,374\,681\,991\,872\,040\,506\,989\,477\,517\,113\,753\,981\,437\,953\,563\,003\,803\,458\,608\,690\,764\,107\,098\,601\,029\,632\,000\,000\,000\,000\, a^{50}\, x^{50}\, +$

$63\,843\,601\,242\,640\,823\,370\,040\,009\,940\,970\,147\,394\,387\,332\,969\,371\,638\,490\,270\,656\,051\,150\,799\,296\,217\,619\,628\,032\,000\,000\,000\,000\, a^{51}\, x^{51}\, +$

$1\,227\,761\,562\,358\,477\,372\,500\,769\,421\,941\,733\,603\,738\,217\,941\,718\,685\,355\,582\,128\,000\,983\,669\,217\,234\,954\,223\,616\,000\,000\,000\,000\, a^{52}\, x^{52}\, +$

$23\,165\,312\,497\,329\,761\,745\,297\,536\,263\,051\,577\,429\,022\,980\,032\,428\,025\,577\,021\,283\,037\,427\,721\,079\,904\,796\,672\,000\,000\,000\,000\, a^{53}\, x^{53}\, +$

$428\,987\,268\,469\,069\,661\,949\,954\,375\,241\,695\,878\,315\,240\,370\,970\,889\,362\,537\,431\,167\,359\,772\,612\,590\,829\,568\,000\,000\,000\,000\, a^{54}\, x^{54}\, +$

$7\,799\,768\,517\,619\,448\,399\,090\,079\,549\,849\,015\,969\,368\,006\,744\,925\,261\,137\,044\,203\,042\,904\,956\,592\,560\,537\,600\,000\,000\,000\, a^{55}\, x^{55}\, +$

$139\,281\,580\,671\,775\,864\,269\,465\,706\,247\,303\,856\,595\,857\,263\,302\,236\,806\,018\,646\,482\,909\,017\,082\,010\,009\,600\,000\,000\,000\, a^{56}\, x^{56}\, +$

$2\,443\,536\,503\,013\,611\,653\,850\,275\,548\,198\,313\,273\,611\,530\,935\,126\,961\,509\,099\,061\,103\,666\,966\,351\,052\,800\,000\,000\,000\, a^{57}\, x^{57}\, +$

$42\,129\,939\,707\,131\,235\,411\,211\,647\,382\,729\,539\,200\,198\,809\,226\,326\,922\,570\,673\,467\,304\,602\,868\,121\,600\,000\,000\,000\, a^{58}\, x^{58}\, +$

$714\,066\,774\,697\,139\,583\,240\,875\,379\,368\,297\,274\,579\,640\,834\,344\,524\,111\,367\,346\,903\,467\,845\,222\,400\,000\,000\,000\, a^{59}\, x^{59}\, +$

$11\,901\,112\,911\,618\,993\,054\,014\,589\,656\,138\,287\,909\,660\,680\,572\,408\,735\,189\,455\,781\,724\,464\,087\,040\,000\,000\,000\, a^{60}\, x^{60}\, +$

$195\,100\,211\,665\,885\,132\,033\,026\,059\,936\,693\,244\,420\,666\,894\,629\,651\,396\,548\,455\,438\,105\,968\,640\,$

$000\,000\,000\,a^{61}\,x^{61}\,+$

$3\,146\,777\,607\,514\,276\,323\,113\,323\,547\,366\,020\,071\,301\,078\,945\,639\,538\,654\,007\,345\,775\,902\,720$
$000\,000\,000\,a^{62}\,x^{62}\,+$

$49\,948\,850\,912\,925\,021\,001\,798\,786\,466\,127\,302\,719\,064\,745\,168\,881\,565\,936\,624\,536\,125\,440\,000$
$000\,000\,a^{63}\,x^{63}\,+$

$780\,450\,795\,514\,453\,453\,153\,106\,038\,533\,239\,104\,985\,386\,643\,263\,774\,467\,759\,758\,376\,960\,000\,000$
$000\,a^{64}\,x^{64}\,+$

$12\,006\,935\,315\,606\,976\,202\,355\,477\,515\,895\,986\,230\,544\,409\,896\,365\,761\,042\,457\,821\,184\,000\,000$
$000\,a^{65}\,x^{65}\,+$

$181\,923\,262\,357\,681\,457\,611\,446\,629\,028\,727\,064\,099\,157\,725\,702\,511\,530\,946\,330\,624\,000\,000\,000$
$a^{66}\,x^{66}\,+$

$2\,715\,272\,572\,502\,708\,322\,558\,904\,910\,876\,523\,344\,763\,548\,144\,813\,604\,939\,497\,472\,000\,000\,000\,a^{67}$
$x^{67}\,+\,39\,930\,479\,007\,392\,769\,449\,395\,660\,454\,066\,519\,775\,934\,531\,541\,376\,543\,227\,904\,000\,000\,000$
$a^{68}\,x^{68}\,+$

$578\,702\,594\,310\,040\,136\,947\,763\,194\,986\,471\,301\,100\,500\,457\,121\,399\,177\,216\,000\,000\,000\,a^{69}\,x^{69}\,+$

$8\,267\,179\,918\,714\,859\,099\,253\,759\,928\,378\,161\,444\,292\,863\,673\,162\,845\,388\,800\,000\,000\,000\,a^{70}\,x^{70}\,+$

$116\,439\,153\,784\,716\,325\,341\,602\,252\,512\,368\,471\,046\,378\,361\,593\,842\,892\,800\,000\,000\,000\,a^{71}\,x^{71}\,+$

$1\,617\,210\,469\,232\,171\,185\,300\,031\,284\,894\,006\,542\,310\,810\,577\,692\,262\,400\,000\,000\,000\,a^{72}\,x^{72}\,+$

$22\,153\,568\,071\,673\,577\,880\,822\,346\,368\,411\,048\,524\,805\,624\,351\,948\,800\,000\,000\,000\,a^{73}\,x^{73}\,+$

$299\,372\,541\,509\,102\,403\,794\,896\,572\,546\,095\,250\,335\,211\,139\,891\,200\,000\,000\,000\,a^{74}\,x^{74}\,+$

$3\,991\,633\,886\,788\,032\,050\,598\,620\,967\,281\,270\,004\,469\,481\,865\,216\,000\,000\,000\,a^{75}\,x^{75}\,+$

$52\,521\,498\,510\,368\,842\,771\,034\,486\,411\,595\,657\,953\,545\,814\,016\,000\,000\,000\,a^{76}\,x^{76}\,+$

$682\,097\,383\,251\,543\,412\,610\,837\,485\,864\,878\,674\,721\,374\,208\,000\,000\,000\,a^{77}\,x^{77}\,+$

$8\,744\,838\,246\,814\,659\,136\,036\,378\,023\,908\,700\,957\,966\,336\,000\,000\,000\,a^{78}\,x^{78}\,+$

$110\,694\,155\,022\,970\,368\,810\,587\,063\,593\,781\,024\,784\,384\,000\,000\,000\,a^{79}\,x^{79}\,+$

$1\,383\,676\,937\,787\,129\,610\,132\,338\,294\,922\,262\,809\,804\,800\,000\,000\,a^{80}\,x^{80}\,+$

$17\,082\,431\,330\,705\,303\,828\,794\,299\,937\,311\,886\,540\,800\,000\,000\,a^{81}\,x^{81}\,+$

$208\,322\,333\,301\,284\,193\,034\,076\,828\,503\,803\,494\,400\,000\,000\,a^{82}\,x^{82}\,+$

$2\,509\,907\,630\,135\,954\,132\,940\,684\,680\,768\,716\,800\,000\,a^{83}\,x^{83}\,+$

$29\,879\,852\,739\,713\,739\,677\,865\,293\,818\,675\,200\,000\,a^{84}\,x^{84}\,+$

$351\,527\,679\,290\,749\,878\,563\,121\,103\,749\,120\,000\,a^{85}\,x^{85}\,+$

$4\,087\,531\,154\,543\,603\,239\,106\,059\,345\,920\,000\,a^{86}\,x^{86}\,+$

$46\,983\,116\,718\,891\,991\,254\,092\,636\,160\,000\,a^{87}\,x^{87}\,+$

$533\,899\,053\,623\,772\,627\,887\,416\,320\,000\,a^{88}\,x^{88}\,+\,5\,998\,865\,771\,053\,625\,032\,442\,880\,000\,a^{89}\,x^{89}\,+$

$66\,654\,064\,122\,818\,055\,916\,032\,000\,a^{90}\,x^{90}\,+\,732\,462\,243\,107\,890\,724\,352\,000\,a^{91}\,x^{91}\,+$

$7\,961\,546\,120\,737\,942\,656\,000\,a^{92}\,x^{92}\,+\,85\,608\,022\,803\,633\,792\,000\,a^{93}\,x^{93}\,+$

$910\,723\,646\,847\,168\,000\,a^{94}\,x^{94}\,+\,9\,586\,564\,703\,654\,400\,a^{95}\,x^{95}\,+\,99\,860\,048\,996\,400\,a^{96}\,x^{96}\,+$

$1\,029\,485\,041\,200\,a^{97}\,x^{97}\,+\,10\,504\,949\,400\,a^{98}\,x^{98}\,+\,106\,110\,600\,a^{99}\,x^{99}\,+$

$1\,061\,106\,a^{100}\,x^{100}\,+\,10\,506\,a^{101}\,x^{101}\,+\,103\,a^{102}\,x^{102}\,+\,a^{103}\,x^{103}\Big)\,+\,x^{101}\,\text{Gamma}[3,\,a\,x]\Big)$

Problem 26: Result more than twice size of optimal antiderivative.

$$\int x^2\,\text{Gamma}[3,\,a\,x]\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{3}\,x^3\,\text{Gamma}[3,\,a\,x]\,-\,\frac{\text{Gamma}[6,\,a\,x]}{3\,a^3}$$

Result (type 4, 62 leaves):

$$\frac{1}{3}\left(-\frac{e^{-ax}\left(120 + 120\,a\,x + 60\,a^2\,x^2 + 20\,a^3\,x^3 + 5\,a^4\,x^4 + a^5\,x^5\right)}{a^3} + x^3\,\text{Gamma}[3,\,a\,x]\right)$$

Problem 27: Result more than twice size of optimal antiderivative.

$$\int x\,\text{Gamma}[3,\,a\,x]\;dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{2}\,x^2\,\text{Gamma}[3,\,a\,x] - \frac{\text{Gamma}[5,\,a\,x]}{2\,a^2}$$

Result (type 4, 53 leaves):

$$e^{-ax}\left(-\frac{12}{a^2} - \frac{12\,x}{a} - 6\,x^2 - 2\,a\,x^3 - \frac{a^2\,x^4}{2}\right) + \frac{1}{2}\,x^2\,\text{Gamma}[3,\,a\,x]$$

Problem 28: Result more than twice size of optimal antiderivative.

$$\int \text{Gamma}[3,\,a\,x]\;dx$$

Optimal (type 4, 18 leaves, 1 step):

$$x\,\text{Gamma}[3,\,a\,x] - \frac{\text{Gamma}[4,\,a\,x]}{a}$$

Result (type 4, 38 leaves):

$$e^{-ax}\left(-\frac{6}{a} - 6\,x - 3\,a\,x^2 - a^2\,x^3\right) + x\,\text{Gamma}[3,\,a\,x]$$

Problem 29: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[3,\,a\,x]}{x}\;dx$$

Optimal (type 4, 23 leaves, 3 steps):

$$-2\,e^{-ax} + 2\,\text{ExpIntegralEi}[-a\,x] - \text{Gamma}[2,\,a\,x]$$

Result (type 4, 56 leaves):

$$e^{-ax}\left(-3 - a\,x\right) + 2\,\text{ExpIntegralEi}[-a\,x] - e^{-ax}\left(2 + 2\,a\,x + a^2\,x^2\right)\text{Log}[a\,x] + \text{Gamma}[3,\,a\,x]\,\text{Log}[a\,x]$$

Problem 33: Result more than twice size of optimal antiderivative.

$$\int x^{100}\,\text{Gamma}[-1,\,a\,x]\;dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{101}\,x^{101}\,\text{Gamma}[-1,\,a\,x] - \frac{\text{Gamma}[100,\,a\,x]}{101\,a^{101}}$$

Result (type 4, 820 leaves) :

$$\frac{1}{101\,a^{101}}\,e^{-a\,x}$$

$\big($ $-933\,262\,154\,439\,441\,526\,816\,992\,388\,562\,667\,004\,907\,159\,682\,643\,816\,214\,685\,929\,638\,952\,175\,999\,932\,$
$299\,156\,089\,414\,639\,761\,565\,182\,862\,536\,979\,208\,272\,237\,582\,511\,852\,109\,168\,640\,000\,000\,000\,000\,$
$000\,000\,000\,-$

$933\,262\,154\,439\,441\,526\,816\,992\,388\,562\,667\,004\,907\,159\,682\,643\,816\,214\,685\,929\,638\,952\,175\,999\,932\,$
$299\,156\,089\,414\,639\,761\,565\,182\,862\,536\,979\,208\,272\,237\,582\,511\,852\,109\,168\,640\,000\,000\,000\,000\,000\,$
$000\,000\,a\,x\,-$

$466\,631\,077\,219\,720\,763\,408\,496\,194\,281\,333\,502\,453\,579\,841\,321\,908\,107\,342\,964\,819\,476\,087\,999\,966\,$
$149\,578\,044\,707\,319\,880\,782\,591\,431\,268\,489\,604\,136\,118\,791\,255\,926\,054\,584\,320\,000\,000\,000\,000\,000\,$
$000\,000\,a^2\,x^2\,-$

$155\,543\,692\,406\,573\,587\,802\,832\,064\,760\,444\,500\,817\,859\,947\,107\,302\,702\,447\,654\,939\,825\,362\,666\,655\,$
$383\,192\,681\,569\,106\,626\,927\,530\,477\,089\,496\,534\,712\,039\,597\,085\,308\,684\,861\,440\,000\,000\,000\,000\,000\,$
$000\,000\,a^3\,x^3\,-$

$38\,885\,923\,101\,643\,396\,950\,708\,016\,190\,111\,125\,204\,464\,986\,776\,825\,675\,611\,913\,734\,956\,340\,666\,663\,$
$845\,798\,170\,392\,276\,656\,731\,882\,619\,272\,374\,133\,678\,009\,899\,271\,327\,171\,215\,360\,000\,000\,000\,000\,000\,$
$000\,000\,a^4\,x^4\,-$

$7\,777\,184\,620\,328\,679\,390\,141\,603\,238\,022\,225\,040\,892\,997\,355\,365\,135\,122\,382\,746\,991\,268\,133\,332\,769\,$
$159\,634\,078\,455\,331\,346\,376\,523\,854\,474\,826\,735\,601\,979\,854\,265\,434\,243\,072\,000\,000\,000\,000\,000\,000\,$
$000\,a^5\,x^5\,-$

$1\,296\,197\,436\,721\,446\,565\,023\,600\,539\,670\,370\,840\,148\,832\,892\,560\,855\,853\,730\,457\,831\,878\,022\,222\,128\,$
$193\,272\,346\,409\,221\,891\,062\,753\,975\,745\,804\,455\,933\,663\,309\,044\,239\,040\,512\,000\,000\,000\,000\,000\,000\,$
$000\,a^6\,x^6\,-$

$185\,171\,062\,388\,778\,080\,717\,657\,219\,952\,910\,120\,021\,261\,841\,794\,407\,979\,104\,351\,118\,839\,717\,460\,304\,$
$027\,610\,335\,201\,317\,413\,008\,964\,853\,677\,972\,065\,133\,380\,472\,720\,605\,577\,216\,000\,000\,000\,000\,000\,000\,$
$000\,a^7\,x^7\,-$

$23\,146\,382\,798\,597\,260\,089\,707\,152\,494\,113\,765\,002\,657\,730\,224\,300\,997\,388\,043\,889\,854\,964\,682\,538\,$
$003\,451\,291\,900\,164\,676\,626\,120\,606\,709\,746\,508\,141\,672\,559\,090\,075\,697\,152\,000\,000\,000\,000\,000\,000\,$
$000\,a^8\,x^8\,-$

$2\,571\,820\,310\,955\,251\,121\,078\,572\,499\,345\,973\,889\,184\,192\,247\,144\,555\,265\,338\,209\,983\,884\,964\,726\,444\,$
$827\,921\,322\,240\,519\,625\,124\,511\,856\,638\,500\,904\,630\,284\,343\,341\,744\,128\,000\,000\,000\,000\,000\,000\,000\,$
$a^9\,x^9\,-$

$257\,182\,031\,095\,525\,112\,107\,857\,249\,934\,597\,388\,918\,419\,224\,714\,455\,526\,533\,820\,998\,388\,496\,472\,644\,$
$482\,792\,132\,224\,051\,962\,512\,451\,185\,663\,850\,090\,463\,028\,434\,334\,174\,412\,800\,000\,000\,000\,000\,000\,000\,$
$a^{10}\,x^{10}\,-$

$23\,380\,184\,645\,047\,737\,464\,350\,659\,084\,963\,398\,992\,583\,565\,883\,132\,320\,593\,983\,727\,126\,226\,952\,058\,$
$589\,344\,739\,293\,095\,632\,955\,677\,380\,514\,895\,462\,769\,366\,221\,303\,106\,764\,800\,000\,000\,000\,000\,000\,000\,$
$a^{11}\,x^{11}\,-$

$1\,948\,348\,720\,420\,644\,788\,695\,888\,257\,080\,283\,249\,381\,963\,823\,594\,360\,049\,498\,643\,927\,185\,579\,338\,215\,$
$778\,728\,274\,424\,636\,079\,639\,781\,709\,574\,621\,897\,447\,185\,108\,592\,230\,400\,000\,000\,000\,000\,000\,000\,$
$a^{12}\,x^{12}\,-$

$149\,872\,978\,493\,895\,752\,976\,606\,789\,006\,175\,634\,567\,843\,371\,045\,720\,003\,807\,587\,994\,398\,890\,718\,324\,$
$290\,671\,405\,724\,972\,006\,126\,137\,054\,582\,663\,222\,880\,552\,700\,660\,940\,800\,000\,000\,000\,000\,000\,000\,$
$a^{13}\,x^{13}\,-$

$10\,705\,212\,749\,563\,982\,355\,471\,913\,500\,441\,116\,754\,845\,955\,074\,694\,285\,986\,256\,285\,314\,206\,479\,880\,$
$306\,476\,528\,980\,355\,143\,294\,724\,075\,327\,333\,087\,348\,610\,907\,190\,067\,200\,000\,000\,000\,000\,000\,000\,$
$a^{14}\,x^{14}\,-$

$713\,680\,849\,970\,932\,157\,031\,460\,900\,029\,407\,783\,656\,397\,004\,979\,619\,065\,750\,419\,020\,947\,098\,658\,687\,$
$098\,435\,265\,357\,009\,552\,981\,605\,021\,822\,205\,823\,240\,727\,146\,004\,480\,000\,000\,000\,000\,000\,000\,$
$a^{15}\,x^{15}\,-$

44 605 053 123 183 259 814 466 306 251 837 986 478 524 812 811 226 191 609 401 188 809 193 666 167 ⸱
943 652 204 084 813 097 061 350 313 863 887 863 952 545 446 625 280 000 000 000 000 000 000
$a^{16} x^{16} -$

2 623 826 654 304 897 636 145 076 838 343 410 969 324 988 988 895 658 329 964 775 812 305 509 774 584 ⸱
920 717 887 341 946 885 961 783 168 463 991 997 208 555 683 840 000 000 000 000 000 000 $a^{17} x^{17} -$

145 768 147 461 383 202 008 059 824 352 411 720 518 054 943 827 536 573 886 931 989 572 528 320 810 ⸱
273 373 215 963 441 493 664 543 509 359 110 666 511 586 426 880 000 000 000 000 000 000 $a^{18} x^{18} -$

7 672 007 761 125 431 684 634 727 597 495 353 711 476 575 990 922 977 572 996 420 503 817 280 042 645 ⸱
967 011 366 496 920 719 186 500 492 584 771 921 662 443 520 000 000 000 000 000 000 $a^{19} x^{19} -$

383 600 388 056 271 584 231 736 379 874 767 685 573 828 799 546 148 878 649 821 025 190 864 002 132 ⸱
298 350 568 324 846 035 959 325 024 629 238 596 083 122 176 000 000 000 000 000 000 $a^{20} x^{20} -$

18 266 685 145 536 742 106 273 160 946 417 508 836 848 990 454 578 518 030 943 858 342 422 095 339 ⸱
633 254 788 967 849 811 236 158 334 506 154 218 861 101 056 000 000 000 000 000 000 $a^{21} x^{21} -$

830 303 870 251 670 095 739 689 133 928 068 583 493 135 929 753 569 001 406 539 015 564 640 697 256 ⸱
057 035 862 174 991 419 825 378 841 188 828 130 050 048 000 000 000 000 000 000 $a^{22} x^{22} -$

36 100 168 271 811 743 293 029 962 344 698 634 064 918 953 467 546 478 322 023 435 459 332 204 228 ⸱
524 218 950 529 347 453 035 886 036 573 427 310 002 176 000 000 000 000 000 000 $a^{23} x^{23} -$

1 504 173 677 992 155 970 542 915 097 695 776 419 371 623 061 147 769 930 084 309 810 805 508 509 521 ⸱
842 456 272 056 143 876 495 251 523 892 804 583 424 000 000 000 000 000 000 $a^{24} x^{24} -$

60 166 947 119 686 238 821 716 603 907 831 056 774 864 922 445 910 797 203 372 392 432 220 340 380 ⸱
873 698 250 882 245 755 059 810 060 955 712 183 336 960 000 000 000 000 000 000 $a^{25} x^{25} -$

2 314 113 350 757 163 031 604 484 765 685 809 875 956 343 170 996 569 123 206 630 478 162 320 783 879 ⸱
757 625 033 932 529 040 761 925 421 373 545 512 960 000 000 000 000 000 000 $a^{26} x^{26} -$

85 707 901 879 894 927 096 462 398 729 104 069 479 864 561 888 761 819 378 023 351 043 048 917 921 ⸱
472 504 630 886 389 964 472 663 904 495 316 500 480 000 000 000 000 000 000 $a^{27} x^{27} -$

3 060 996 495 710 533 110 587 942 811 753 716 767 138 020 067 455 779 263 500 833 965 823 175 640 052 ⸱
589 451 103 085 355 874 023 710 874 832 732 160 000 000 000 000 000 000 $a^{28} x^{28} -$

105 551 603 300 363 210 709 929 062 474 266 095 418 552 416 119 164 802 189 683 929 855 971 573 794 ⸱
916 877 624 244 322 616 345 645 202 580 439 040 000 000 000 000 000 000 $a^{29} x^{29} -$

3 518 386 776 678 773 690 330 968 749 142 203 180 618 413 870 638 826 739 656 130 995 199 052 459 830 ⸱
562 587 474 810 753 878 188 173 419 347 968 000 000 000 000 000 000 $a^{30} x^{30} -$

113 496 347 634 799 151 300 998 991 907 813 005 826 400 447 439 962 152 892 133 257 909 646 853 542 ⸱
921 373 789 510 024 318 651 231 400 624 128 000 000 000 000 000 000 $a^{31} x^{31} -$

3 546 760 863 587 473 478 156 218 497 119 156 432 075 013 982 498 817 277 879 164 309 676 464 173 216 ⸱
292 930 922 188 259 957 850 981 269 504 000 000 000 000 000 000 $a^{32} x^{32} -$

107 477 601 926 893 135 701 703 590 821 792 619 153 788 302 499 964 159 935 732 251 808 377 702 218 ⸱
675 543 361 278 432 119 934 878 220 288 000 000 000 000 000 000 $a^{33} x^{33} -$

3 161 105 939 026 268 697 108 929 141 817 429 975 111 420 661 763 651 762 815 654 464 952 285 359 372 ⸱
810 098 861 130 356 468 672 888 832 000 000 000 000 000 000 $a^{34} x^{34} -$

90 317 312 543 607 677 060 255 118 337 640 856 431 754 876 050 390 050 366 161 556 141 493 867 410 ⸱
651 717 110 318 010 184 819 225 395 200 000 000 000 000 000 $a^{35} x^{35} -$

2 508 814 237 322 435 473 895 975 509 378 912 678 659 857 668 066 390 287 948 932 115 041 496 316 962 ⸱
547 697 508 833 616 244 978 483 200 000 000 000 000 000 $a^{36} x^{36} -$

67 805 790 197 903 661 456 647 986 739 970 612 936 752 909 947 740 278 052 673 840 947 067 468 026 ⸱
014 802 635 373 881 520 134 553 600 000 000 000 000 000 $a^{37} x^{37} -$

1 784 362 899 944 833 196 227 578 598 420 279 287 809 287 103 887 902 054 017 732 656 501 775 474 368 ⸱
810 595 667 733 724 214 067 200 000 000 000 000 000 $a^{38} x^{38} -$

45 752 894 870 380 338 364 809 707 651 802 033 020 750 951 381 741 078 308 146 991 192 353 217 291 ⸱
507 963 991 480 351 902 924 800 000 000 000 000 000 $a^{39} x^{39} -$

1 143 822 371 759 508 459 120 242 691 295 050 825 518 773 784 543 526 957 703 674 779 808 830 432 287 ⸱
699 099 787 008 797 573 120 000 000 000 000 000 $a^{40} x^{40} -$

27 898 106 628 280 694 124 883 968 080 367 093 305 335 945 964 476 267 261 065 238 531 922 693 470 ⸦
431 685 360 658 751 160 320 000 000 000 000 $a^{41} x^{41}$ −

664 240 634 006 683 193 449 618 287 627 787 935 841 332 046 773 244 458 596 791 393 617 206 987 391 ⸦
230 603 825 208 360 960 000 000 000 000 $a^{42} x^{42}$ −

15 447 456 604 806 585 894 177 169 479 715 998 507 937 954 576 121 964 153 413 753 339 935 046 218 ⸦
400 711 716 865 310 720 000 000 000 000 $a^{43} x^{43}$ −

351 078 559 200 149 679 413 117 488 175 363 602 453 135 331 275 499 185 304 858 030 453 069 232 236 ⸦
379 811 746 938 880 000 000 000 000 $a^{44} x^{44}$ −

7 801 745 760 003 326 209 180 388 626 119 191 165 625 229 583 899 981 895 663 511 787 845 982 938 586 ⸦
218 038 820 864 000 000 000 000 $a^{45} x^{45}$ −

169 603 168 695 724 482 808 269 317 959 112 851 426 635 425 736 956 128 166 598 082 344 477 889 969 ⸦
265 609 539 584 000 000 000 000 $a^{46} x^{46}$ −

3 608 578 057 355 840 059 750 411 020 406 656 413 332 668 632 701 194 216 310 597 496 691 018 935 516 ⸦
289 564 672 000 000 000 000 $a^{47} x^{47}$ −

75 178 709 528 246 667 911 466 896 258 472 008 611 097 263 181 274 879 506 470 781 181 062 894 489 ⸦
922 699 264 000 000 000 000 $a^{48} x^{48}$ −

1 534 259 378 127 483 018 601 365 229 764 734 869 614 229 860 842 344 479 723 893 493 491 079 479 386 ⸦
177 536 000 000 000 000 $a^{49} x^{49}$ −

30 685 187 562 549 660 372 027 304 595 294 697 392 284 597 216 846 889 594 477 869 869 821 589 587 ⸦
723 550 720 000 000 000 $a^{50} x^{50}$ −

601 670 344 363 718 830 824 064 795 986 170 537 103 619 553 271 507 639 107 409 213 133 756 658 582 ⸦
814 720 000 000 000 $a^{51} x^{51}$ −

11 570 583 545 456 131 362 001 246 076 657 125 713 531 145 255 221 300 752 065 561 791 033 781 895 ⸦
823 360 000 000 000 $a^{52} x^{52}$ −

218 312 897 084 077 950 226 438 605 219 945 768 179 832 929 343 798 127 397 463 430 019 505 318 789 ⸦
120 000 000 000 $a^{53} x^{53}$ −

4 042 831 427 482 925 004 193 307 504 073 069 781 108 017 210 070 335 692 545 619 074 435 283 681 280 ⸦
000 000 000 $a^{54} x^{54}$ −

73 506 025 954 235 000 076 241 954 619 510 359 656 509 403 819 460 648 955 374 892 262 459 703 296 ⸦
000 000 000 $a^{55} x^{55}$ −

1 312 607 606 325 625 001 361 463 475 348 399 279 580 525 068 204 654 445 631 694 504 686 780 416 000 ⸦
000 000 $a^{56} x^{56}$ −

23 028 203 619 747 807 041 429 183 778 042 092 624 219 738 038 678 148 168 977 096 573 452 288 000 ⸦
000 000 $a^{57} x^{57}$ −

397 037 993 443 927 707 610 847 996 173 139 528 003 788 586 873 761 175 327 191 320 231 936 000 000 000
$a^{58} x^{58}$ −

6 729 457 515 998 774 705 268 610 104 629 483 525 487 942 150 402 731 785 206 632 546 304 000 000 000
$a^{59} x^{59}$ −

112 157 625 266 646 245 087 810 168 410 491 392 091 465 702 506 712 196 420 110 542 438 400 000 000
$a^{60} x^{60}$ −

1 838 649 594 535 184 345 701 806 039 516 252 329 368 290 205 028 068 793 772 303 974 400 000 000
$a^{61} x^{61}$ −

29 655 638 621 535 231 382 287 194 185 746 005 312 391 777 500 452 722 480 198 451 200 000 000 $a^{62} x^{62}$ −

470 724 422 564 051 291 782 336 415 646 761 989 085 583 769 848 455 912 384 102 400 000 000 $a^{63} x^{63}$ −

7 355 069 102 563 301 434 099 006 494 480 656 079 462 246 403 882 123 631 001 600 000 000 $a^{64} x^{64}$ −

113 154 909 270 204 637 447 677 022 992 010 093 530 188 406 213 571 132 784 640 000 000 $a^{65} x^{65}$ −

1 714 468 322 275 827 840 116 318 530 181 971 114 093 763 730 508 653 527 040 000 000 $a^{66} x^{66}$ −

25 589 079 436 952 654 330 094 306 420 626 434 538 712 891 500 129 157 120 000 000 $a^{67} x^{67}$ −

376 309 991 719 891 975 442 563 329 715 094 625 569 307 227 943 075 840 000 000 $a^{68} x^{68}$ −

5 453 767 995 940 463 412 211 062 749 494 125 008 250 829 390 479 360 000 000 $a^{69} x^{69}$ −

77 910 971 370 578 048 745 872 324 992 773 214 403 583 277 006 848 000 000 $a^{70} x^{70}$ −

$$1\,097\,337\,624\,937\,718\,996\,420\,736\,971\,729\,200\,202\,867\,370\,098\,688\,000\,000\,a^{71}\,x^{71}\,-$$
$$15\,240\,800\,346\,357\,208\,283\,621\,346\,829\,572\,225\,039\,824\,584\,704\,000\,000\,a^{72}\,x^{72}\,-$$
$$208\,778\,086\,936\,400\,113\,474\,265\,025\,062\,633\,219\,723\,624\,448\,000\,000\,a^{73}\,x^{73}\,-$$
$$2\,821\,325\,499\,140\,542\,073\,976\,554\,392\,738\,286\,753\,021\,952\,000\,000\,a^{74}\,x^{74}\,-$$
$$37\,617\,673\,321\,873\,894\,319\,687\,391\,903\,177\,156\,706\,959\,360\,000\,a^{75}\,x^{75}\,-$$
$$494\,969\,385\,814\,130\,188\,416\,939\,367\,147\,067\,851\,407\,360\,000\,a^{76}\,x^{76}\,-$$
$$6\,428\,173\,841\,741\,950\,498\,921\,290\,482\,429\,452\,615\,680\,000\,a^{77}\,x^{77}\,-$$
$$82\,412\,485\,150\,537\,826\,909\,247\,313\,877\,300\,674\,560\,000\,a^{78}\,x^{78}\,-$$
$$1\,043\,196\,014\,563\,769\,960\,876\,548\,276\,927\,856\,640\,000\,a^{79}\,x^{79}\,-$$
$$13\,039\,950\,182\,047\,124\,510\,956\,853\,461\,598\,208\,000\,a^{80}\,x^{80}\,-$$
$$160\,987\,039\,284\,532\,401\,369\,837\,697\,056\,768\,000\,a^{81}\,x^{81}\,-$$
$$1\,963\,256\,576\,640\,639\,041\,095\,581\,671\,424\,000\,a^{82}\,x^{82}\,-$$
$$23\,653\,693\,694\,465\,530\,615\,609\,417\,728\,000\,a^{83}\,x^{83}\,-\,281\,591\,591\,600\,780\,126\,376\,302\,592\,000\,a^{84}\,x^{84}\,-$$
$$3\,312\,842\,254\,126\,825\,016\,191\,795\,200\,a^{85}\,x^{85}\,-\,38\,521\,421\,559\,614\,244\,374\,323\,200\,a^{86}\,x^{86}\,-$$
$$442\,774\,960\,455\,336\,142\,233\,600\,a^{87}\,x^{87}\,-\,5\,031\,533\,641\,537\,910\,707\,200\,a^{88}\,x^{88}\,-$$
$$56\,534\,085\,859\,976\,524\,800\,a^{89}\,x^{89}\,-\,628\,156\,509\,555\,294\,720\,a^{90}\,x^{90}\,-\,6\,902\,818\,786\,321\,920\,a^{91}\,x^{91}\,-$$
$$75\,030\,638\,981\,760\,a^{92}\,x^{92}\,-\,806\,781\,064\,320\,a^{93}\,x^{93}\,-\,8\,582\,777\,280\,a^{94}\,x^{94}\,-\,90\,345\,024\,a^{95}\,x^{95}\,-$$
$$941\,094\,a^{96}\,x^{96}\,-\,9702\,a^{97}\,x^{97}\,-\,99\,a^{98}\,x^{98}\,-\,a^{99}\,x^{99}\,+\,a^{101}\,e^{a\,x}\,x^{101}\,\text{Gamma}[-1,\,a\,x]\big)$$

Problem 38: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-1,\,a\,x]}{x}\,\mathbb{d}x$$

Optimal (type 5, 39 leaves, 2 steps):

$$-\text{Gamma}[-1,\,a\,x]\,-\,a\,x\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-a\,x]\,+$$
$$\text{EulerGamma}\,\text{Log}[x]\,+\,\frac{1}{2}\,\text{Log}[a\,x]^2$$

Result (type 5, 103 leaves):

$$-\frac{e^{-a\,x}}{a\,x}\,-\,a\,x\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-a\,x]\,+\,\text{EulerGamma}\,\text{Log}[x]\,+$$
$$\text{Gamma}[0,\,a\,x]\,\text{Log}[x]\,-\,\frac{\text{Log}[x]^2}{2}\,+\,\text{ExpIntegralEi}[-a\,x]\,\big(-1+\text{Log}[x]-\text{Log}[a\,x]\big)\,-$$
$$\frac{e^{-a\,x}\,\text{Log}[a\,x]}{a\,x}\,+\,\text{Gamma}[-1,\,a\,x]\,\text{Log}[a\,x]\,+\,\text{Log}[x]\,\text{Log}[a\,x]$$

Problem 39: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-1,\,a\,x]}{x^2}\,\mathbb{d}x$$

Optimal (type 4, 18 leaves, 1 step):

$$a\,\text{Gamma}[-2,\,a\,x]\,-\,\frac{\text{Gamma}[-1,\,a\,x]}{x}$$

Result (type 4, 42 leaves):

$$\frac{1}{2} \left(\frac{e^{-a\,x}\,(1 - a\,x)}{a\,x^2} - a\,\text{ExpIntegralEi}\,[-a\,x] - \frac{2\,\text{Gamma}\,[-1,\,a\,x]}{x} \right)$$

Problem 40: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}\,[-1,\,a\,x]}{x^3}\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{2}\,a^2\,\text{Gamma}\,[-3,\,a\,x] - \frac{\text{Gamma}\,[-1,\,a\,x]}{2\,x^2}$$

Result (type 4, 58 leaves):

$$e^{-a\,x} \left(\frac{1}{6\,a\,x^3} - \frac{1}{12\,x^2} + \frac{a}{12\,x} \right) + \frac{1}{12}\,a^2\,\text{ExpIntegralEi}\,[-a\,x] - \frac{\text{Gamma}\,[-1,\,a\,x]}{2\,x^2}$$

Problem 41: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}\,[-1,\,a\,x]}{x^4}\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{3}\,a^3\,\text{Gamma}\,[-4,\,a\,x] - \frac{\text{Gamma}\,[-1,\,a\,x]}{3\,x^3}$$

Result (type 4, 68 leaves):

$$e^{-a\,x} \left(\frac{1}{12\,a\,x^4} - \frac{1}{36\,x^3} + \frac{a}{72\,x^2} - \frac{a^2}{72\,x} \right) - \frac{1}{72}\,a^3\,\text{ExpIntegralEi}\,[-a\,x] - \frac{\text{Gamma}\,[-1,\,a\,x]}{3\,x^3}$$

Problem 42: Result more than twice size of optimal antiderivative.

$$\int x^{100}\,\text{Gamma}\,[-2,\,a\,x]\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{101}\,x^{101}\,\text{Gamma}\,[-2,\,a\,x] - \frac{\text{Gamma}\,[99,\,a\,x]}{101\,a^{101}}$$

Result (type 4, 812 leaves):

$$\frac{1}{101\,a^{101}}\,e^{-a\,x}$$

$(-9\,426\,890\,448\,883\,247\,745\,626\,185\,743\,057\,242\,473\,809\,693\,764\,078\,951\,663\,494\,238\,777\,294\,707\,070\,023\, \cdot$

$223\,798\,882\,976\,159\,207\,729\,119\,823\,605\,850\,588\,608\,460\,429\,412\,647\,567\,360\,000\,000\,000\,000\,000\, \cdot$

$000\,000 -$

$9\,426\,890\,448\,883\,247\,745\,626\,185\,743\,057\,242\,473\,809\,693\,764\,078\,951\,663\,494\,238\,777\,294\,707\,070\,023\, \cdot$

$223\,798\,882\,976\,159\,207\,729\,119\,823\,605\,850\,588\,608\,460\,429\,412\,647\,567\,360\,000\,000\,000\,000\,000\,000\, \cdot$

$000\,a\,x -$

$4\,713\,445\,224\,441\,623\,872\,813\,092\,871\,528\,621\,236\,904\,846\,882\,039\,475\,831\,747\,119\,388\,647\,353\,535\,011\, \cdot$

611 899 441 488 079 603 864 559 911 802 925 294 304 230 214 706 323 783 680 000 000 000 000 000 000 000 a^2 x^2 –

1 571 148 408 147 207 957 604 364 290 509 540 412 301 615 627 346 491 943 915 706 462 882 451 178 337 203 966 480 496 026 534 621 519 970 600 975 098 101 410 071 568 774 594 560 000 000 000 000 000 000 000 a^3 x^3 –

392 787 102 036 801 989 401 091 072 627 385 103 075 403 906 836 622 985 978 926 615 720 612 794 584 300 991 620 124 006 633 655 379 992 650 243 774 525 352 517 892 193 648 640 000 000 000 000 000 000 000 a^4 x^4 –

78 557 420 407 360 397 880 218 214 525 477 020 615 080 781 367 324 597 195 785 323 144 122 558 916 860 198 324 024 801 326 731 075 998 530 048 754 905 070 503 578 438 729 728 000 000 000 000 000 000 000 a^5 x^5 –

13 092 903 401 226 732 980 036 369 087 579 503 435 846 796 894 554 099 532 630 887 190 687 093 152 810 033 054 004 133 554 455 179 333 088 341 459 150 845 083 929 739 788 288 000 000 000 000 000 000 000 a^6 x^6 –

1 870 414 771 603 818 997 148 052 726 797 071 919 406 685 270 650 585 647 518 698 170 098 156 164 687 147 579 143 447 650 636 454 190 441 191 637 021 549 297 704 248 541 184 000 000 000 000 000 000 000 a^7 x^7 –

233 801 846 450 477 374 643 506 590 849 633 989 925 835 658 831 323 205 939 837 271 262 269 520 585 893 447 392 930 956 329 556 773 805 148 954 627 693 662 213 031 067 648 000 000 000 000 000 000 000 a^8 x^8 –

25 977 982 938 941 930 515 945 176 761 070 443 325 092 850 981 258 133 993 315 252 362 474 391 176 210 383 043 658 995 147 728 530 422 794 328 291 965 962 468 114 563 072 000 000 000 000 000 000 000 a^9 x^9 –

2 597 798 293 894 193 051 594 517 676 107 044 332 509 285 098 125 813 399 331 525 236 247 439 117 621 038 304 365 899 514 772 853 042 279 432 829 196 596 246 811 456 307 200 000 000 000 000 000 000 a^{10} x^{10} –

236 163 481 263 108 459 235 865 243 282 458 575 682 662 281 647 801 218 121 047 748 749 767 192 511 003 482 215 081 774 070 259 367 479 948 439 017 872 386 073 768 755 200 000 000 000 000 000 000 a^{11} x^{11} –

19 680 290 105 259 038 269 655 436 940 204 881 306 888 523 470 650 101 510 087 312 395 813 932 709 250 290 184 590 147 839 188 280 623 329 036 584 822 698 839 480 729 600 000 000 000 000 000 000 a^{12} x^{12} –

1 513 868 469 635 310 636 127 341 303 092 683 177 452 963 343 896 161 654 622 100 953 524 148 669 942 330 014 199 242 141 476 021 586 409 925 891 140 207 603 036 979 200 000 000 000 000 000 000 a^{13} x^{13} –

108 133 462 116 807 902 580 524 378 792 334 512 675 211 667 421 154 403 901 578 639 537 439 190 710 166 429 585 660 152 962 572 970 457 851 849 367 157 685 931 212 800 000 000 000 000 000 000 a^{14} x^{14} –

7 208 897 474 453 860 172 034 958 586 155 634 178 347 444 494 743 626 926 771 909 302 495 946 047 344 428 639 044 010 197 504 864 697 190 123 291 143 845 728 747 520 000 000 000 000 000 000 a^{15} x^{15} –

450 556 092 153 366 260 752 184 911 634 727 136 146 715 280 921 476 682 923 244 331 405 996 627 959 026 789 940 250 637 344 054 043 574 382 705 696 490 358 046 720 000 000 000 000 000 000 a^{16} x^{16} –

26 503 299 538 433 309 456 010 877 154 983 949 185 100 898 877 733 922 524 896 725 376 823 331 056 413 340 584 720 625 726 120 826 092 610 747 393 911 197 532 160 000 000 000 000 000 000 a^{17} x^{17} –

1 472 405 529 912 961 636 445 048 730 832 441 621 394 494 382 096 329 029 160 929 187 601 296 169 800 741 143 595 590 318 117 823 671 811 708 188 550 622 085 120 000 000 000 000 000 000 a^{18} x^{18} –

77 495 027 890 155 875 602 370 985 833 286 401 126 026 020 110 333 106 797 943 641 452 699 798 410 565 323 347 136 332 532 517 035 358 510 957 292 138 004 480 000 000 000 000 000 000 a^{19} x^{19} –

3 874 751 394 507 793 780 118 549 291 664 320 056 301 301 005 516 655 339 897 182 072 634 989 920 528 266 167 356 816 626 625 851 767 925 547 864 606 900 224 000 000 000 000 000 000 a^{20} x^{20} –

184 511 971 167 037 799 053 264 251 984 015 240 776 252 428 834 126 444 757 008 670 125 475 710 501

346 007 969 372 220 315 516 750 853 597 517 362 233 344 000 000 000 000 000 000 $a^{21} x^{21}$ −

8 386 907 780 319 899 956 966 556 908 364 329 126 193 292 219 733 020 216 227 666 823 885 259 568 243 000 362 244 191 832 523 488 675 163 523 516 465 152 000 000 000 000 000 000 $a^{22} x^{22}$ −

364 648 164 361 734 780 737 676 387 320 188 222 877 969 226 944 913 922 444 681 166 255 880 850 793 173 928 793 225 731 848 847 333 702 761 892 020 224 000 000 000 000 000 000 $a^{23} x^{23}$ −

15 193 673 515 072 282 530 736 516 138 341 175 953 248 717 789 371 413 435 195 048 593 995 035 449 715 580 366 384 405 493 701 972 237 615 078 834 176 000 000 000 000 000 000 $a^{24} x^{24}$ −

607 746 940 602 891 301 229 460 645 533 647 038 129 948 711 574 856 537 407 801 943 759 801 417 988 623 214 655 376 219 748 078 889 504 603 153 367 040 000 000 000 000 000 $a^{25} x^{25}$ −

23 374 882 330 880 434 662 671 563 289 755 655 312 690 335 060 571 405 284 915 459 375 376 977 614 947 046 717 514 469 990 310 726 519 407 813 591 040 000 000 000 000 000 $a^{26} x^{26}$ −

865 736 382 625 201 283 802 650 492 213 172 418 988 530 928 169 311 306 848 720 717 606 554 726 479 520 248 796 832 221 863 360 241 459 548 651 520 000 000 000 000 000 $a^{27} x^{27}$ −

30 919 156 522 328 617 278 666 089 007 613 300 678 161 818 863 189 689 530 311 454 200 234 097 374 268 580 314 172 579 352 262 865 766 412 451 840 000 000 000 000 000 $a^{28} x^{28}$ −

1 066 177 811 114 779 906 160 899 620 952 182 782 005 579 960 799 644 466 562 463 937 939 106 806 009 261 390 143 882 046 629 753 991 945 256 960 000 000 000 000 000 $a^{29} x^{29}$ −

35 539 260 370 492 663 538 696 654 031 739 426 066 852 665 359 988 148 885 415 464 597 970 226 866 975 379 671 462 734 887 658 466 398 175 232 000 000 000 000 000 $a^{30} x^{30}$ −

1 146 427 753 886 860 114 151 504 968 765 787 937 640 408 559 999 617 705 981 144 019 289 362 156 999 205 795 853 636 609 279 305 367 683 072 000 000 000 000 000 $a^{31} x^{31}$ −

35 825 867 308 964 378 567 234 530 273 930 873 051 262 767 499 988 053 311 910 750 602 792 567 406 225 181 120 426 144 039 978 292 740 096 000 000 000 000 000 $a^{32} x^{32}$

1 085 632 342 695 890 259 613 167 584 058 511 304 583 720 227 272 365 251 876 083 351 599 774 769 885 611 549 103 822 546 666 008 870 912 000 000 000 000 000 $a^{33} x^{33}$ −

31 930 363 020 467 360 576 857 870 119 367 979 546 580 006 684 481 330 937 531 863 282 346 316 761 341 516 150 112 427 843 117 907 968 000 000 000 000 000 $a^{34} x^{34}$ −

912 296 086 299 067 445 053 082 003 410 513 701 330 857 333 842 323 741 072 338 950 924 180 478 895 471 890 003 212 224 089 083 084 800 000 000 000 000 000 $a^{35} x^{35}$ −

25 341 557 952 751 873 473 696 722 316 958 713 925 857 148 162 286 770 585 342 748 636 782 791 080 429 774 722 311 450 669 141 196 800 000 000 000 000 000 $a^{36} x^{36}$ −

684 906 971 695 996 580 370 181 684 242 127 403 401 544 544 926 669 475 279 533 746 940 075 434 606 210 127 630 039 207 274 086 400 000 000 000 000 000 $a^{37} x^{37}$ −

18 023 867 676 210 436 325 531 096 953 740 194 826 356 435 392 807 091 454 724 572 287 896 721 963 321 319 148 158 926 507 212 800 000 000 000 000 000 $a^{38} x^{38}$ −

462 150 453 236 165 033 987 976 844 967 697 303 239 908 599 815 566 447 557 040 315 074 274 922 136 444 080 722 023 756 595 200 000 000 000 000 000 $a^{39} x^{39}$ −

11 553 761 330 904 125 849 699 421 124 192 432 580 997 714 995 389 161 188 926 007 876 856 873 053 411 102 018 050 593 914 880 000 000 000 000 000 $a^{40} x^{40}$ −

281 799 056 851 320 142 675 595 637 175 425 184 902 383 292 570 467 346 071 366 045 776 996 903 741 734 195 562 209 607 680 000 000 000 000 000 $a^{41} x^{41}$ −

6 709 501 353 602 860 539 895 134 218 462 504 402 437 697 442 153 984 430 270 620 137 547 545 327 184 147 513 385 943 040 000 000 000 000 000 $a^{42} x^{42}$ −

156 034 915 200 066 524 183 607 772 522 383 823 312 504 591 677 999 637 913 270 235 756 919 658 771 724 360 776 417 280 000 000 000 000 000 $a^{43} x^{43}$ −

3 546 248 072 728 784 640 536 540 284 599 632 348 011 467 992 681 809 952 574 323 539 929 992 244 811 917 290 373 120 000 000 000 000 000 $a^{44} x^{44}$ −

78 805 512 727 306 325 345 256 450 768 880 718 844 699 288 726 262 443 390 540 523 109 555 383 218 042 606 452 736 000 000 000 000 000 $a^{45} x^{45}$ −

1 713 163 320 158 833 159 679 488 060 193 059 105 319 549 754 918 748 769 359 576 589 338 160 504 740 056 662 016 000 000 000 000 000 $a^{46} x^{46}$ −

36 450 283 407 634 748 078 286 980 004 107 640 538 713 824 572 739 335 518 288 863 602 939 585 207
  235 248 128 000 000 000 000 $a^{47} x^{47}$ −

759 380 904 325 723 918 297 645 416 752 242 511 223 204 678 598 736 156 631 017 991 727 908 025 150
  734 336 000 000 000 000 $a^{48} x^{48}$ −

15 497 569 476 035 182 006 074 396 260 249 847 167 820 503 644 872 166 461 857 510 035 263 429 084
  708 864 000 000 000 000 $a^{49} x^{49}$ −

309 951 389 520 703 640 121 487 925 204 996 943 356 410 072 897 443 329 237 150 200 705 268 581 694
  177 280 000 000 000 $a^{50} x^{50}$ −

6 077 478 225 896 149 806 303 684 807 941 116 536 400 197 507 793 006 455 630 396 092 260 168 268 513
  280 000 000 000 $a^{51} x^{51}$ −

116 874 581 267 233 650 121 224 707 845 021 471 853 849 952 072 942 431 839 046 078 697 310 928 240
  640 000 000 000 $a^{52} x^{52}$ −

2 205 180 778 627 050 002 287 258 638 585 310 789 695 282 114 583 819 468 661 246 767 873 791 098 880
  000 000 000 $a^{53} x^{53}$ −

40 836 681 085 686 111 153 467 752 566 394 644 253 616 335 455 255 916 086 319 384 590 255 390 720
  000 000 000 $a^{54} x^{54}$ −

742 485 110 648 838 384 608 504 592 116 266 259 156 660 644 641 016 656 114 897 901 641 007 104 000
  000 000 $a^{55} x^{55}$ −

13 258 662 690 157 828 296 580 439 144 933 326 056 368 940 082 875 297 430 623 176 815 017 984 000
  000 000 $a^{56} x^{56}$ −

232 608 117 371 189 970 115 446 300 788 303 965 901 209 475 138 163 112 817 950 470 438 912 000 000 000
  $a^{57} x^{57}$ −

4 010 484 782 261 896 036 473 212 082 556 964 929 331 197 847 209 708 841 688 801 214 464 000 000 000
  $a^{58} x^{58}$ −

67 974 318 343 421 966 719 884 950 551 812 964 903 918 607 579 825 573 587 945 783 296 000 000 000
  $a^{59} x^{59}$ −

1 132 905 305 723 699 445 331 415 842 530 216 081 731 976 792 997 092 893 132 429 721 600 000 000
  $a^{60} x^{60}$ −

18 572 218 126 618 023 693 957 636 762 790 427 569 376 668 737 657 260 543 154 585 600 000 000 $a^{61} x^{61}$ −

299 551 905 268 032 640 225 123 173 593 393 993 054 462 398 994 471 944 244 428 800 000 000 $a^{62} x^{62}$ −

4 754 792 147 111 629 209 922 590 057 037 999 889 753 371 412 610 665 781 657 600 000 000 $a^{63} x^{63}$ −

74 293 627 298 619 206 405 040 469 641 218 748 277 396 428 322 041 652 838 400 000 000 $a^{64} x^{64}$ −

1 142 978 881 517 218 560 077 545 686 787 980 742 729 175 820 339 102 351 360 000 000 $a^{65} x^{65}$ −

17 317 861 841 169 978 182 993 116 466 484 556 708 017 815 459 683 368 960 000 000 $a^{66} x^{66}$ −

258 475 549 868 208 629 596 912 186 066 933 682 209 221 126 263 930 880 000 000 $a^{67} x^{67}$ −

3 801 111 027 473 656 317 601 649 795 101 965 914 841 487 150 940 160 000 000 $a^{68} x^{68}$ −

55 088 565 615 560 236 486 980 431 813 071 969 780 311 407 984 640 000 000 $a^{69} x^{69}$ −

786 979 508 793 717 664 099 720 454 472 456 711 147 305 828 352 000 000 $a^{70} x^{70}$ −

11 084 218 433 714 333 297 179 161 330 597 981 847 145 152 512 000 000 $a^{71} x^{71}$ −

153 947 478 246 032 406 905 266 129 591 638 636 765 904 896 000 000 $a^{72} x^{72}$ −

2 108 869 565 014 142 560 346 111 364 269 022 421 450 752 000 000 $a^{73} x^{73}$ −

28 498 237 365 055 980 545 217 721 138 770 573 262 848 000 000 $a^{74} x^{74}$ −

379 976 498 200 746 407 269 569 615 183 607 643 504 640 000 $a^{75} x^{75}$ −

4 999 690 765 799 294 832 494 337 041 889 574 256 640 000 $a^{76} x^{76}$ −

64 931 048 906 484 348 473 952 429 115 449 016 320 000 $a^{77} x^{77}$ −

832 449 344 954 927 544 537 851 655 326 269 440 000 $a^{78} x^{78}$ −

10 537 333 480 442 120 816 934 831 080 079 360 000 $a^{79} x^{79}$ −

131 716 668 505 526 510 211 685 388 500 992 000 $a^{80} x^{80}$ −

1 626 131 709 944 771 731 008 461 586 432 000 $a^{81} x^{81}$ −

19 830 874 511 521 606 475 712 946 176 000 $a^{82} x^{82}$ − 238 926 198 933 995 258 743 529 472 000 $a^{83} x^{83}$ −

2 844 359 511 118 991 175 518 208 000 $a^{84} x^{84}$ − 33 463 053 071 988 131 476 684 800 $a^{85} x^{85}$ −

$389\,105\,268\,278\,931\,761\,356\,800\,a^{86}\,x^{86} - 4\,472\,474\,348\,033\,698\,406\,400\,a^{87}\,x^{87} -$
$50\,823\,572\,136\,746\,572\,800\,a^{88}\,x^{88} - 571\,051\,372\,322\,995\,200\,a^{89}\,x^{89} - 6\,345\,015\,248\,033\,280\,a^{90}\,x^{90} -$
$69\,725\,442\,286\,080\,a^{91}\,x^{91} - 757\,885\,242\,240\,a^{92}\,x^{92} - 8\,149\,303\,680\,a^{93}\,x^{93} - 86\,694\,720\,a^{94}\,x^{94} -$
$912\,576\,a^{95}\,x^{95} - 9506\,a^{96}\,x^{96} - 98\,a^{97}\,x^{97} - a^{98}\,x^{98} + a^{101}\,e^{a\,x}\,x^{101}\,\text{Gamma}[-2,\,a\,x])$

Problem 47: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-2,\,a\,x]}{x}\,dx$$

Optimal (type 5, 55 leaves, 3 steps):

$$-\frac{1}{2}\,\text{Gamma}[-2,\,a\,x] + \frac{1}{2}\,\text{Gamma}[-1,\,a\,x] +$$
$$\frac{1}{2}\,a\,x\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-a\,x] - \frac{1}{2}\,\text{EulerGamma}\,\text{Log}[x] - \frac{1}{4}\,\text{Log}[a\,x]^2$$

Result (type 5, 121 leaves):

$$\text{Gamma}[-2,\,a\,x]\,\text{Log}[a\,x] +$$
$$\frac{1}{4}\left(\frac{e^{-a\,x}\,(-1 + 3\,a\,x)}{a^2\,x^2} + 3\,\text{ExpIntegralEi}[-a\,x] + 2\,a\,x\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\right.$$
$$-a\,x] - 2\,\text{ExpIntegralEi}[-a\,x]\,\text{Log}[x] + \text{Log}[x]^2 + \frac{2\,e^{-a\,x}\,(-1 + a\,x)\,\text{Log}[a\,x]}{a^2\,x^2} +$$
$$\left.2\,\text{ExpIntegralEi}[-a\,x]\,\text{Log}[a\,x] - 2\,\text{Log}[x]\,(\text{EulerGamma} + \text{Gamma}[0,\,a\,x] + \text{Log}[a\,x])\right)$$

Problem 48: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-2,\,a\,x]}{x^2}\,dx$$

Optimal (type 4, 18 leaves, 1 step):

$$a\,\text{Gamma}[-3,\,a\,x] - \frac{\text{Gamma}[-2,\,a\,x]}{x}$$

Result (type 4, 48 leaves):

$$\frac{1}{6}\left(\frac{e^{-a\,x}\,(2 - a\,x + a^2\,x^2)}{a^2\,x^3} + a\,\text{ExpIntegralEi}[-a\,x] - \frac{6\,\text{Gamma}[-2,\,a\,x]}{x}\right)$$

Problem 49: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-2,\,a\,x]}{x^3}\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{2}\,a^2\,\text{Gamma}[-4,\,a\,x] - \frac{\text{Gamma}[-2,\,a\,x]}{2\,x^2}$$

Result (type 4, 68 leaves) :

$$e^{-ax} \left(\frac{1}{8\,a^2\,x^4} - \frac{1}{24\,a\,x^3} + \frac{1}{48\,x^2} - \frac{a}{48\,x} \right) - \frac{1}{48}\,a^2\,\text{ExpIntegralEi}\left[-a\,x\right] - \frac{\text{Gamma}\left[-2,\,a\,x\right]}{2\,x^2}$$

Problem 50: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}\left[-2,\,a\,x\right]}{x^4} \, dx$$

Optimal (type 4, 25 leaves, 1 step) :

$$\frac{1}{3}\,a^3\,\text{Gamma}\left[-5,\,a\,x\right] - \frac{\text{Gamma}\left[-2,\,a\,x\right]}{3\,x^3}$$

Result (type 4, 78 leaves) :

$$e^{-ax} \left(\frac{1}{15\,a^2\,x^5} - \frac{1}{60\,a\,x^4} + \frac{1}{180\,x^3} - \frac{a}{360\,x^2} + \frac{a^2}{360\,x} \right) + \frac{1}{360}\,a^3\,\text{ExpIntegralEi}\left[-a\,x\right] - \frac{\text{Gamma}\left[-2,\,a\,x\right]}{3\,x^3}$$

Problem 51: Result more than twice size of optimal antiderivative.

$$\int x^{100}\,\text{Gamma}\left[-3,\,a\,x\right] \, dx$$

Optimal (type 4, 25 leaves, 1 step) :

$$\frac{1}{101}\,x^{101}\,\text{Gamma}\left[-3,\,a\,x\right] - \frac{\text{Gamma}\left[98,\,a\,x\right]}{101\,a^{101}}$$

Result (type 4, 804 leaves) :

$$\frac{1}{101\,a^{101}}\,e^{-ax}$$

$\big(-96\,192\,759\,682\,482\,119\,853\,328\,425\,949\,563\,698\,712\,343\,813\,919\,172\,976\,158\,104\,477\,319\,333\,745\,612$
  $481\,875\,498\,805\,879\,175\,589\,072\,651\,261\,284\,189\,679\,678\,167\,647\,067\,832\,320\,000\,000\,000\,000\,000$
  $000\,000 -$
  $96\,192\,759\,682\,482\,119\,853\,328\,425\,949\,563\,698\,712\,343\,813\,919\,172\,976\,158\,104\,477\,319\,333\,745\,612$
  $481\,875\,498\,805\,879\,175\,589\,072\,651\,261\,284\,189\,679\,678\,167\,647\,067\,832\,320\,000\,000\,000\,000\,000\,000\,000$
  $000\,a\,x -$
  $48\,096\,379\,841\,241\,059\,926\,664\,212\,974\,781\,849\,356\,171\,906\,959\,586\,488\,079\,052\,238\,659\,666\,872\,806$
  $240\,937\,749\,402\,939\,587\,794\,536\,325\,630\,642\,094\,839\,839\,083\,823\,533\,916\,160\,000\,000\,000\,000\,000\,000\,000$
  $000\,a^2\,x^2 -$
  $16\,032\,126\,613\,747\,019\,975\,554\,737\,658\,260\,616\,452\,057\,302\,319\,862\,162\,693\,017\,412\,886\,555\,624\,268$
  $746\,979\,249\,800\,979\,862\,598\,178\,775\,210\,214\,031\,613\,279\,694\,607\,844\,638\,720\,000\,000\,000\,000\,000\,000\,000$
  $000\,a^3\,x^3 -$
  $4\,008\,031\,653\,436\,754\,993\,888\,684\,414\,565\,154\,113\,014\,325\,579\,965\,540\,673\,254\,353\,221\,638\,906\,067\,186$
  $744\,812\,450\,244\,965\,649\,544\,693\,802\,553\,507\,903\,319\,923\,651\,961\,159\,680\,000\,000\,000\,000\,000\,000\,000\,000$
  $a^4\,x^4 -$
  $801\,606\,330\,687\,350\,998\,777\,736\,882\,913\,030\,822\,602\,865\,115\,993\,108\,134\,650\,870\,644\,327\,781\,213\,437$
  $348\,962\,490\,048\,993\,129\,908\,938\,760\,510\,701\,580\,663\,984\,730\,392\,231\,936\,000\,000\,000\,000\,000\,000\,000\,000$
  $a^5\,x^5 -$
  $133\,601\,055\,114\,558\,499\,796\,289\,480\,485\,505\,137\,100\,477\,519\,332\,184\,689\,108\,478\,440\,721\,296\,868\,906$
  $224\,827\,081\,674\,832\,188\,318\,156\,460\,085\,116\,930\,110\,664\,121\,732\,038\,656\,000\,000\,000\,000\,000\,000\,000\,000$

$a^6 x^6$ –

19 085 865 016 365 499 970 898 497 212 215 019 585 782 502 761 740 669 872 639 777 245 899 552 700 ⁚
   889 261 011 667 833 169 759 736 637 155 016 704 301 523 445 961 719 808 000 000 000 000 000 000 000

$a^7 x^7$ –

2 385 733 127 045 687 496 362 312 151 526 877 448 222 812 845 217 583 734 079 972 155 737 444 087 611 ⁚
   157 626 458 479 146 219 967 079 644 377 088 037 690 430 745 214 976 000 000 000 000 000 000 000

$a^8 x^8$ –

265 081 458 560 631 944 040 256 905 725 208 605 358 090 316 135 287 081 564 441 350 637 493 787 512 ⁚
   350 847 384 275 460 691 107 453 293 819 676 448 632 270 082 801 664 000 000 000 000 000 000 000

$a^9 x^9$ –

26 508 145 856 063 194 404 025 690 572 520 860 535 809 031 613 528 708 156 444 135 063 749 378 751 ⁚
   235 084 738 427 546 069 110 745 329 381 967 644 863 227 008 280 166 400 000 000 000 000 000 000

$a^{10} x^{10}$ –

2 409 831 441 460 290 400 365 971 870 229 169 139 619 002 873 957 155 286 949 466 823 977 216 250 112 ⁚
   280 430 766 140 551 737 340 484 489 269 785 896 657 000 752 742 400 000 000 000 000 000 000

$a^{11} x^{11}$ –

200 819 286 788 357 533 363 830 989 185 764 094 968 250 239 496 429 607 245 788 901 998 101 354 176 ⁚
   023 369 230 511 712 644 778 373 707 439 148 824 721 416 729 395 200 000 000 000 000 000 000

$a^{12} x^{12}$ –

15 447 637 445 258 271 797 217 768 398 904 930 382 173 095 345 879 200 557 368 377 076 777 027 244 ⁚
   309 489 940 808 593 280 367 567 208 264 549 909 593 955 133 030 400 000 000 000 000 000 000

$a^{13} x^{13}$ –

1 103 402 674 661 305 128 372 697 742 778 923 598 726 649 667 562 800 039 812 026 934 055 501 946 022 ⁚
   106 424 343 470 948 597 683 372 018 896 422 113 853 938 073 600 000 000 000 000 000 $a^{14} x^{14}$ –

73 560 178 310 753 675 224 846 516 185 261 573 248 443 311 170 853 335 987 468 462 270 366 796 401 ⁚
   473 761 622 898 063 239 845 558 134 593 094 807 590 262 538 240 000 000 000 000 000 000 $a^{15} x^{15}$ –

4 597 511 144 422 104 701 552 907 261 578 848 328 027 706 948 178 333 499 216 778 891 897 924 775 092 ⁚
   110 101 431 128 952 490 347 383 412 068 425 474 391 408 640 000 000 000 000 000 000 $a^{16} x^{16}$ –

270 441 832 024 829 688 326 641 603 622 285 195 766 335 702 834 019 617 600 986 993 641 054 398 534 ⁚
   830 005 966 536 997 205 314 551 965 415 789 733 787 729 920 000 000 000 000 000 000 $a^{17} x^{17}$ –

15 024 546 223 601 649 351 480 089 090 126 955 320 351 983 490 778 867 644 499 277 424 503 022 140 ⁚
   823 889 220 363 166 511 406 363 998 078 654 985 210 429 440 000 000 000 000 000 000 $a^{18} x^{18}$ –

790 765 590 715 876 281 656 846 794 217 208 174 755 367 552 146 256 191 815 751 443 394 895 902 148 ⁚
   625 748 440 166 658 495 071 789 372 560 788 695 285 760 000 000 000 000 000 000 $a^{19} x^{19}$ –

39 538 279 535 793 814 082 842 339 710 860 408 737 768 377 607 312 809 590 787 572 169 744 795 107 ⁚
   431 287 422 008 332 924 753 589 468 628 039 434 764 288 000 000 000 000 000 000 $a^{20} x^{20}$ –

1 882 775 215 990 181 622 992 492 367 183 828 987 512 779 886 062 514 742 418 455 817 606 895 005 115 ⁚
   775 591 524 206 329 750 170 927 077 525 687 369 728 000 000 000 000 000 000 $a^{21} x^{21}$ –

85 580 691 635 917 346 499 658 743 962 901 317 614 217 267 548 296 124 655 384 355 345 767 954 777 ⁚
   989 799 614 736 651 352 280 496 685 342 076 698 624 000 000 000 000 000 000 $a^{22} x^{22}$ –

3 720 899 636 344 232 456 506 901 911 430 492 070 183 359 458 621 570 637 190 624 145 468 171 946 869 ⁚
   121 722 379 854 406 620 891 160 232 264 204 288 000 000 000 000 000 000 $a^{23} x^{23}$ –

155 037 484 847 676 352 354 454 246 309 603 836 257 639 977 442 565 443 216 276 006 061 173 831 119 ⁚
   546 738 432 493 933 609 203 798 343 011 008 512 000 000 000 000 000 000 $a^{24} x^{24}$ –

6 201 499 393 907 054 094 178 169 852 384 153 450 305 599 097 702 617 728 651 040 242 446 953 244 781 ⁚
   869 537 299 757 344 368 151 933 720 440 340 480 000 000 000 000 000 000 $a^{25} x^{25}$ –

238 519 207 457 963 619 006 852 686 630 159 748 088 676 888 373 177 604 948 116 932 401 805 894 030 ⁚
   071 905 280 759 897 860 313 535 912 324 628 480 000 000 000 000 000 000 $a^{26} x^{26}$ –

8 834 044 720 665 319 222 476 025 430 746 657 336 617 662 532 339 911 294 374 701 200 066 884 964 076 ⁚
   737 232 620 736 957 789 390 218 974 986 240 000 000 000 000 000 000 $a^{27} x^{27}$ –

315 501 597 166 618 543 659 858 051 098 094 904 879 202 233 297 853 974 799 096 471 430 960 177 288 ⁚

454 901 165 026 319 921 049 650 677 678 080 000 000 000 000 000 000 a^{28} x^{28} −

10 879 365 419 538 570 471 029 587 968 899 824 306 179 387 355 098 412 924 106 774 876 929 661 285 808 789 695 345 735 169 691 367 264 747 520 000 000 000 000 000 a^{29} x^{29} −

362 645 513 984 619 015 700 986 265 629 994 143 539 312 911 836 613 764 136 892 495 897 655 376 193 626 323 178 191 172 323 045 575 491 584 000 000 000 000 000 a^{30} x^{30} −

11 698 242 386 600 613 409 709 234 375 161 101 404 493 964 897 955 282 714 093 306 319 279 205 683 665 365 263 812 618 462 033 728 241 664 000 000 000 000 000 a^{31} x^{31} −

365 570 074 581 269 169 053 413 574 223 784 418 890 436 403 061 102 584 815 415 822 477 475 177 614 542 664 494 144 326 938 554 007 552 000 000 000 000 000 a^{32} x^{32} −

11 077 881 047 917 247 547 073 138 612 841 952 087 588 981 910 942 502 570 164 115 832 650 762 958 016 444 378 610 434 149 653 151 744 000 000 000 000 000 a^{33} x^{33} −

325 820 030 821 095 516 090 386 429 789 469 179 046 734 762 086 544 193 240 121 053 901 493 028 176 954 246 429 718 651 460 386 816 000 000 000 000 000 a^{34} x^{34} −

9 309 143 737 745 586 174 011 040 851 127 690 829 906 707 488 186 976 949 717 744 397 185 515 090 770 121 326 563 390 041 725 337 600 000 000 000 000 a^{35} x^{35} −

258 587 326 048 488 504 833 640 023 642 435 856 386 297 430 227 416 026 381 048 455 477 375 419 188 058 925 737 871 945 603 481 600 000 000 000 000 a^{36} x^{36} −

6 988 846 649 959 148 779 287 568 206 552 320 442 872 903 519 659 892 604 893 201 499 388 524 842 920 511 506 428 971 502 796 800 000 000 000 000 a^{37} x^{37} −

183 917 017 104 188 125 770 725 479 119 797 906 391 392 197 885 786 647 497 189 513 141 803 285 340 013 460 695 499 250 073 600 000 000 000 000 a^{38} x^{38} −

4 715 820 951 389 439 122 326 294 336 405 074 522 856 210 202 199 657 628 133 064 439 533 417 572 820 857 966 551 262 822 400 000 000 000 000 a^{39} x^{39} −

117 895 523 784 735 978 058 157 358 410 126 863 071 405 255 054 991 440 703 326 610 988 335 439 320 521 449 163 781 570 560 000 000 000 000 a^{40} x^{40} −

2 875 500 580 115 511 659 955 057 522 198 216 172 473 298 903 780 279 041 544 551 487 520 376 568 793 206 077 165 404 160 000 000 000 000 a^{41} x^{41} −

68 464 299 526 559 801 427 501 369 576 148 004 106 507 116 756 673 310 512 965 511 607 628 013 542 695 382 789 652 480 000 000 000 000 a^{42} x^{42} −

1 592 193 012 245 576 777 383 752 780 840 651 258 290 863 180 387 751 407 278 267 711 805 302 640 527 799 599 759 360 000 000 000 000 a^{43} x^{43} −

36 186 204 823 763 108 576 903 472 291 832 983 142 974 163 190 630 713 801 778 811 631 938 696 375 631 809 085 440 000 000 000 000 a^{44} x^{44} −

804 137 884 972 513 523 931 188 273 151 844 069 843 870 293 125 126 973 372 862 480 709 748 808 347 373 535 232 000 000 000 000 a^{45} x^{45} −

17 481 258 368 967 685 302 851 918 981 561 827 605 301 528 111 415 803 768 975 271 319 777 148 007 551 598 592 000 000 000 000 a^{46} x^{46} −

371 941 667 424 844 368 145 785 510 245 996 332 027 692 087 476 931 995 084 580 240 846 322 298 033 012 736 000 000 000 000 a^{47} x^{47} −

7 748 784 738 017 591 003 037 198 130 124 923 583 910 251 822 436 083 230 928 755 017 631 714 542 354 432 000 000 000 000 a^{48} x^{48} −

158 138 464 041 175 326 592 595 880 206 631 093 549 188 812 702 777 208 794 464 388 114 932 949 843 968 000 000 000 000 a^{49} x^{49} −

3 162 769 280 823 506 531 851 917 604 132 621 870 983 776 254 055 544 175 889 287 762 298 658 996 879 360 000 000 000 a^{50} x^{50} −

62 015 083 937 715 814 350 037 600 081 031 801 391 838 750 079 520 474 037 044 858 084 287 431 311 360 000 000 000 a^{51} x^{51} −

1 192 597 768 032 996 429 808 415 386 173 688 488 304 591 347 683 086 039 173 939 578 543 989 063 680 000 000 000 a^{52} x^{52} −

22 501 844 679 867 857 166 196 516 720 258 273 364 237 572 597 794 076 210 829 048 651 773 378 560 000 000 000 a^{53} x^{53} −

416 700 827 404 960 317 892 528 087 412 190 247 485 880 974 033 223 633 533 871 271 329 136 640 000 ⋯
   000 000 a^{54} x^{54} −

7 576 378 680 090 187 598 045 965 225 676 186 317 925 108 618 785 884 246 070 386 751 438 848 000 000 ⋯
   000 a^{55} x^{55} −

135 292 476 430 181 921 393 677 950 458 503 327 105 805 511 049 747 932 965 542 620 561 408 000 000 000
   a^{56} x^{56} −

2 373 552 218 073 367 041 994 350 008 043 918 019 400 096 685 083 297 069 570 923 167 744 000 000 000
   a^{57} x^{57} −

40 923 314 104 713 224 861 971 551 862 826 172 748 277 529 053 160 294 302 946 951 168 000 000 000 a^{58}
   x^{58} − 693 615 493 300 224 150 202 907 658 691 969 029 631 822 526 324 750 750 897 405 952 000 000 000
   a^{59} x^{59} −

11 560 258 221 670 402 503 381 794 311 532 817 160 530 375 438 745 845 848 290 099 200 000 000 a^{60} x^{60} −
189 512 429 863 449 221 366 914 660 844 800 281 320 170 089 159 767 964 726 067 200 000 000 a^{61} x^{61} −
3 056 652 094 571 761 634 950 236 465 238 714 214 841 453 050 963 999 431 065 600 000 000 a^{62} x^{62} −
48 518 287 215 424 787 856 352 959 765 693 876 426 054 810 332 761 895 731 200 000 000 a^{63} x^{63} −
758 098 237 741 012 310 255 514 996 338 966 819 157 106 411 449 404 620 800 000 000 a^{64} x^{64} −
11 663 049 811 400 189 388 546 384 559 061 027 987 032 406 329 990 840 320 000 000 a^{65} x^{65} −
176 712 875 930 305 899 826 460 372 106 985 272 530 794 035 302 891 520 000 000 a^{66} x^{66} −
2 637 505 610 900 088 057 111 348 837 417 690 634 787 970 676 162 560 000 000 a^{67} x^{67} −
38 786 847 219 118 942 016 343 365 256 142 509 335 117 215 825 920 000 000 a^{68} x^{68} −
562 128 220 566 941 188 642 657 467 480 326 222 248 075 591 680 000 000 a^{69} x^{69} −
8 030 403 150 956 302 694 895 106 678 290 374 603 543 937 024 000 000 a^{70} x^{70} −
113 104 269 731 778 911 195 705 727 863 244 712 725 970 944 000 000 a^{71} x^{71} −
1 570 892 635 163 595 988 829 246 220 322 843 232 305 152 000 000 a^{72} x^{72} −
21 519 077 194 021 862 860 674 605 757 847 167 565 824 000 000 a^{73} x^{73} −
290 798 340 459 754 903 522 629 807 538 475 237 376 000 000 a^{74} x^{74} −
3 877 311 206 130 065 380 301 730 767 179 669 831 680 000 a^{75} x^{75} −
51 017 252 712 237 702 372 391 194 304 995 655 680 000 a^{76} x^{76} −
662 561 723 535 554 576 264 820 705 259 683 840 000 a^{77} x^{77} −
8 494 381 070 968 648 413 651 547 503 329 280 000 a^{78} x^{78} −
107 523 811 024 919 600 172 804 398 776 320 000 a^{79} x^{79} −
1 344 047 637 811 495 002 160 054 984 704 000 a^{80} x^{80} −
16 593 180 713 722 160 520 494 505 984 000 a^{81} x^{81} − 202 355 862 362 465 372 201 152 512 000 a^{82} x^{82} −
2 438 022 438 101 992 436 158 464 000 a^{83} x^{83} − 29 024 076 644 071 338 525 696 000 a^{84} x^{84} −
341 459 725 224 368 688 537 600 a^{85} x^{85} − 3 970 461 921 213 589 401 600 a^{86} x^{86} −
45 637 493 347 282 636 800 a^{87} x^{87} − 518 607 878 946 393 600 a^{88} x^{88} − 5 827 054 819 622 400 a^{89} x^{89} −
64 745 053 551 360 a^{90} x^{90} − 711 484 104 960 a^{91} x^{91} − 7 733 522 880 a^{92} x^{92} − 83 156 160 a^{93} x^{93} −
884 640 a^{94} x^{94} − 9312 a^{95} x^{95} − 97 a^{96} x^{96} − a^{97} x^{97} + a^{101} $e^{a x}$ x^{101} Gamma [−3, a x])

Problem 55: Result more than twice size of optimal antiderivative.

$$\int \text{Gamma}[-3, a\, x]\, dx$$

Optimal (type 4, 18 leaves, 1 step):

$$x\, \text{Gamma}[-3, a\, x] - \frac{\text{Gamma}[-2, a\, x]}{a}$$

Result (type 4, 40 leaves):

$$\frac{1}{2}\left(\frac{e^{-ax}\left(-1+ax\right)}{a^3\,x^2}+\frac{\text{ExpIntegralEi}[-ax]}{a}+2\,x\,\text{Gamma}[-3,\,ax]\right)$$

Problem 56: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Gamma}[-3,\,ax]}{x}\,dx$$

Optimal (type 5, 64 leaves, 4 steps):

$$-\frac{1}{3}\,\text{Gamma}[-3,\,ax]+\frac{1}{6}\,\text{Gamma}[-2,\,ax]-\frac{1}{6}\,\text{Gamma}[-1,\,ax]-$$
$$\frac{1}{6}\,ax\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-ax]+\frac{1}{6}\,\text{EulerGamma Log}[x]+\frac{1}{12}\,\text{Log}[ax]^2$$

Result (type 5, 145 leaves):

$$\text{Gamma}[-3,\,ax]\,\text{Log}[ax]+\frac{1}{36}\left(\frac{e^{-ax}\left(-4+5\,ax-11\,a^2\,x^2\right)}{a^3\,x^3}-11\,\text{ExpIntegralEi}[-ax]-\right.$$
$$6\,ax\,\text{HypergeometricPFQ}[\{1,\,1,\,1\},\,\{2,\,2,\,2\},\,-ax]+6\,\text{ExpIntegralEi}[-ax]\,\text{Log}[x]-$$
$$3\,\text{Log}[x]^2-\frac{6\,e^{-ax}\left(2-ax+a^2\,x^2+a^3\,e^{ax}\,x^3\,\text{ExpIntegralEi}[-ax]\right)\,\text{Log}[ax]}{a^3\,x^3}+$$
$$\left.6\,\text{Log}[x]\left(\text{EulerGamma}+\text{Gamma}[0,\,ax]+\text{Log}[ax]\right)\right)$$

Problem 57: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Gamma}[-3,\,ax]}{x^2}\,dx$$

Optimal (type 4, 18 leaves, 1 step):

$$a\,\text{Gamma}[-4,\,ax]-\frac{\text{Gamma}[-3,\,ax]}{x}$$

Result (type 4, 66 leaves):

$$e^{-ax}\left(\frac{1}{4\,a^3\,x^4}-\frac{1}{12\,a^2\,x^3}+\frac{1}{24\,a\,x^2}-\frac{1}{24\,x}\right)-\frac{1}{24}\,a\,\text{ExpIntegralEi}[-ax]-\frac{\text{Gamma}[-3,\,ax]}{x}$$

Problem 58: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Gamma}[-3,\,ax]}{x^3}\,dx$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{2}\,a^2\,\text{Gamma}[-5,\,ax]-\frac{\text{Gamma}[-3,\,ax]}{2\,x^2}$$

Result (type 4, 78 leaves):

$$\mathbb{e}^{-a\,x}\left(\frac{1}{10\,a^3\,x^5}-\frac{1}{40\,a^2\,x^4}+\frac{1}{120\,a\,x^3}-\frac{1}{240\,x^2}+\frac{a}{240\,x}\right)+\frac{1}{240}\,a^2\,\text{ExpIntegralEi}\,[-a\,x]-\frac{\text{Gamma}\,[-3,\,a\,x]}{2\,x^2}$$

Problem 59: Result more than twice size of optimal antiderivative.

$$\int\frac{\text{Gamma}\,[-3,\,a\,x]}{x^4}\,\mathbb{d}x$$

Optimal (type 4, 25 leaves, 1 step):

$$\frac{1}{3}\,a^3\,\text{Gamma}\,[-6,\,a\,x]-\frac{\text{Gamma}\,[-3,\,a\,x]}{3\,x^3}$$

Result (type 4, 88 leaves):

$$\mathbb{e}^{-a\,x}\left(\frac{1}{18\,a^3\,x^6}-\frac{1}{90\,a^2\,x^5}+\frac{1}{360\,a\,x^4}-\frac{1}{1080\,x^3}+\frac{a}{2160\,x^2}-\frac{a^2}{2160\,x}\right)-\frac{a^3\,\text{ExpIntegralEi}\,[-a\,x]}{2160}-\frac{\text{Gamma}\,[-3,\,a\,x]}{3\,x^3}$$

Problem 60: Result more than twice size of optimal antiderivative.

$$\int x^{100}\,\text{Gamma}\left[\frac{1}{2},\,a\,x\right]\mathbb{d}x$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{101}\,x^{101}\,\text{Gamma}\left[\frac{1}{2},\,a\,x\right]-\frac{\text{Gamma}\left[\frac{203}{2},\,a\,x\right]}{101\,a^{101}}$$

Result (type 4, 856 leaves):

$$\frac{1}{256\,065\,421\,246\,102\,339\,102\,334\,047\,485\,952\,a^{101}}\,\mathbb{e}^{-a\,x}\left(-2\,\sqrt{a\,x}\right.$$

$$\left(1\,339\,928\,042\,684\,663\,702\,626\,654\,216\,353\,741\,866\,828\,222\,367\,324\,552\,136\,009\,000\,175\,903\,930\,373\,\right.$$

$$973\,956\,200\,201\,339\,808\,971\,908\,813\,302\,485\,337\,859\,343\,555\,595\,880\,232\,757\,068\,702\,494\,068\,539\,$$

$$027\,184\,400\,769\,291\,974\,725\,364\,464\,819\,431\,304\,931\,640\,625+$$

$$893\,285\,361\,789\,775\,801\,751\,102\,810\,902\,494\,577\,885\,481\,578\,216\,368\,090\,672\,666\,783\,935\,953\,582\,$$

$$649\,304\,133\,467\,559\,872\,647\,939\,208\,868\,323\,558\,572\,895\,703\,730\,586\,821\,838\,045\,801\,662\,712\,$$

$$359\,351\,456\,267\,179\,527\,983\,150\,242\,976\,546\,287\,536\,621\,093\,750\,a\,x+$$

$$357\,314\,144\,715\,910\,320\,700\,441\,124\,360\,997\,831\,154\,192\,631\,286\,547\,236\,269\,066\,713\,574\,381\,433\,$$

$$059\,721\,653\,387\,023\,949\,059\,175\,683\,547\,329\,423\,429\,158\,281\,492\,234\,728\,735\,218\,320\,665\,084\,$$

$$943\,740\,582\,506\,871\,811\,193\,260\,097\,190\,618\,515\,014\,648\,437\,500\,a^2\,x^2+$$

$$102\,089\,755\,633\,117\,234\,485\,840\,321\,245\,999\,380\,329\,769\,323\,224\,727\,781\,791\,161\,918\,164\,108\,980\,$$

$$874\,206\,186\,682\,006\,842\,588\,335\,909\,584\,951\,263\,836\,902\,366\,140\,638\,493\,924\,348\,091\,618\,595\,$$

$$698\,211\,595\,001\,963\,374\,626\,645\,742\,054\,462\,432\,861\,328\,125\,000\,a^3\,x^3+$$

$$22\,686\,612\,362\,914\,940\,996\,853\,404\,721\,333\,195\,628\,837\,627\,383\,272\,840\,398\,035\,981\,814\,246\,440\,$$

$$194\,268\,041\,484\,890\,409\,464\,074\,646\,574\,433\,614\,185\,978\,303\,586\,808\,554\,205\,410\,687\,026\,354\,$$

$$599\,602\,576\,667\,102\,972\,139\,254\,609\,345\,436\,096\,191\,406\,250\,000\,a^4\,x^4+$$

$$4\,124\,838\,611\,439\,080\,181\,246\,073\,585\,696\,944\,659\,788\,659\,524\,231\,425\,526\,915\,633\,057\,135\,716\,$$

$$398\,957\,825\,724\,525\,528\,993\,468\,117\,558\,987\,929\,851\,996\,055\,197\,601\,555\,310\,074\,670\,368\,428\,$$

$$109\,018\,650\,303\,109\,631\,298\,046\,292\,608\,261\,108\,398\,437\,500\,000\,a^5\,x^5+$$

$$634\,590\,555\,606\,012\,335\,576\,319\,013\,184\,145\,332\,275\,178\,388\,343\,296\,234\,910\,097\,393\,405\,494\,830\,$$

608 896 265 311 619 845 148 941 162 921 219 977 230 162 338 092 546 970 780 718 518 219 709 \
079 792 354 324 558 661 237 891 170 501 708 984 375 000 000 a^6 x^6 +

84 612 074 080 801 644 743 509 201 757 886 044 303 357 118 445 772 831 321 346 319 120 732 644 \
081 186 168 708 215 979 353 192 155 056 162 663 630 688 311 745 672 929 437 429 135 762 627 \
877 305 647 243 274 488 165 052 156 066 894 531 250 000 000 a^7 x^7 +

9 954 361 656 564 899 381 589 317 853 868 946 388 630 249 228 914 450 743 687 802 249 497 958 \
127 198 372 789 201 879 923 904 959 418 372 078 074 198 624 911 255 638 757 344 604 207 367 \
985 565 370 263 914 645 666 476 724 243 164 062 500 000 000 a^8 x^8 +

1 047 827 542 796 305 198 062 033 458 301 994 356 697 920 971 464 679 025 651 347 605 210 311 \
381 810 355 030 442 303 149 884 732 570 354 955 586 757 749 990 658 488 290 246 800 442 880 \
840 585 828 448 833 120 596 471 234 130 859 375 000 000 000 a^9 x^9 +

99 793 099 313 933 828 386 860 329 362 094 700 637 897 235 377 588 478 633 461 676 686 696 322 \
077 176 669 565 933 633 322 355 482 890 948 151 119 785 713 396 046 503 833 028 613 607 699 \
103 412 233 222 201 961 568 688 964 843 750 000 000 000 a^{10} x^{10} +

8 677 660 809 907 289 424 944 376 466 269 104 403 295 411 771 964 215 533 344 493 624 930 114 \
963 232 753 875 298 576 810 639 607 207 908 534 879 981 366 382 264 913 376 785 096 835 452 \
095 948 889 845 408 866 223 364 257 812 500 000 000 000 a^{11} x^{11} +

694 212 864 792 583 153 995 550 117 301 528 352 263 632 941 757 137 242 667 559 489 994 409 197 \
058 620 310 023 886 144 851 168 576 632 682 790 398 509 310 581 193 070 142 807 746 836 167 \
675 911 187 632 709 297 869 140 625 000 000 000 000 a^{12} x^{12} +

51 423 175 169 820 974 370 040 749 429 742 840 908 417 254 944 973 129 086 485 888 147 734 014 \
596 934 837 779 547 121 840 827 301 972 791 317 807 296 985 968 977 264 455 022 796 061 938 \
346 363 791 676 496 985 027 343 750 000 000 000 000 a^{13} x^{13} +

3 546 425 873 780 756 853 106 258 581 361 575 235 063 258 961 722 284 764 585 233 665 360 966 \
523 926 540 536 520 491 161 436 365 653 295 952 952 227 378 342 688 087 203 794 675 590 478 \
506 645 778 736 310 136 898 437 500 000 000 000 000 a^{14} x^{14} +

228 801 669 276 177 861 490 726 360 087 843 563 552 468 320 111 115 146 102 273 139 700 707 517 \
672 680 034 614 225 236 221 701 009 890 061 480 788 863 118 883 102 400 244 817 780 030 871 \
396 501 853 955 492 703 125 000 000 000 000 000 a^{15} x^{15} +

13 866 767 834 919 870 393 377 355 156 839 003 851 664 746 673 400 917 945 592 311 497 012 576 \
828 647 274 825 104 559 771 012 182 417 579 483 684 173 522 356 551 660 620 898 047 274 598 \
266 454 657 815 484 406 250 000 000 000 000 000 a^{16} x^{16} +

792 386 733 423 992 593 907 277 437 533 657 362 952 271 238 480 052 454 033 846 371 257 861 533 \
065 558 561 434 546 272 629 267 566 718 827 639 095 629 848 945 809 178 337 031 272 834 186 \
654 551 875 170 537 500 000 000 000 000 000 a^{17} x^{17} +

42 831 715 320 215 815 886 879 861 488 305 803 402 825 472 350 273 105 623 451 155 203 127 650 \
435 976 138 455 921 420 142 122 571 173 990 683 194 358 370 213 286 982 612 812 501 234 280 \
359 705 506 765 975 000 000 000 000 000 000 a^{18} x^{18} +

2 196 498 221 549 529 019 839 992 896 836 195 046 298 742 171 808 877 211 459 033 600 160 392 \
330 050 058 382 354 944 622 672 952 367 896 958 112 531 198 472 476 255 518 605 769 294 065 \
659 472 077 270 050 000 000 000 000 000 000 a^{19} x^{19} +

107 146 254 709 733 122 919 024 043 748 107 075 429 206 935 210 189 132 266 294 321 959 043 528 \
295 124 799 139 265 591 349 900 115 507 168 688 416 156 023 047 622 220 419 793 624 100 763 \
876 686 696 100 000 000 000 000 000 000 000 a^{20} x^{20} +

4 983 546 730 685 261 531 117 397 383 632 887 229 265 438 846 985 541 035 641 596 370 188 071 \
083 494 176 704 151 887 969 762 796 070 100 869 228 658 419 676 633 591 647 432 261 586 082 \
040 776 125 400 000 000 000 000 000 000 000 a^{21} x^{21} +

221 490 965 808 233 845 827 439 883 717 017 210 189 575 059 866 024 046 028 515 394 230 580 937 \
044 185 631 295 639 465 322 790 936 448 927 521 273 707 541 183 715 184 330 322 737 159 201 \
812 272 240 000 000 000 000 000 000 000 000 a^{22} x^{22} +

9 425 147 481 201 440 247 976 165 264 553 923 837 854 257 866 639 321 107 596 399 754 492 805 \

831 667 473 672 154 870 864 799 614 316 975 639 203 136 491 114 200 646 141 715 861 155 710 ·.
715 415 840 000 000 000 000 000 000 000 $a^{23} x^{23}$ +

384 699 897 191 895 520 325 557 765 900 160 156 647 112 565 985 278 412 554 955 092 020 114 523 ·.
741 529 537 638 974 321 012 229 155 794 924 049 107 611 882 212 271 271 090 443 312 477 988 ·.
384 320 000 000 000 000 000 000 000 $a^{24} x^{24}$ +

15 086 270 478 113 549 816 688 539 839 221 966 927 337 747 685 697 192 649 213 925 177 259 393 ·.
087 903 119 123 097 032 196 558 006 109 604 864 670 886 740 478 912 598 866 291 894 606 979 ·.
936 640 000 000 000 000 000 000 000 $a^{25} x^{25}$ +

569 293 225 589 190 559 120 322 258 083 847 808 578 782 931 535 743 118 838 261 327 443 750 682 ·.
562 381 853 701 774 799 870 113 438 098 296 780 033 461 904 864 626 372 312 901 683 282 261 ·.
760 000 000 000 000 000 000 000 $a^{26} x^{26}$ +

20 701 571 839 606 929 422 557 173 021 230 829 402 864 833 874 027 022 503 209 502 816 136 388 ·.
456 813 885 589 155 447 268 004 125 021 756 246 546 671 341 995 077 322 629 560 061 210 264 ·.
064 000 000 000 000 000 000 000 $a^{27} x^{27}$ +

726 370 941 740 594 014 826 567 474 429 151 908 872 450 311 369 369 210 638 929 923 373 206 612 ·.
519 785 459 268 612 184 842 250 000 763 377 071 813 029 543 686 923 601 037 195 130 184 704 ·.
000 000 000 000 000 000 000 $a^{28} x^{28}$ +

24 622 743 787 816 746 265 307 372 014 547 522 334 659 332 588 792 176 631 828 132 995 701 919 ·.
068 467 303 704 020 752 028 550 847 483 504 307 519 085 747 243 624 528 848 718 478 989 312 ·.
000 000 000 000 000 000 000 $a^{29} x^{29}$ +

807 303 075 010 385 123 452 700 721 788 443 355 234 732 216 025 973 004 322 233 868 711 538 330 ·.
113 682 088 656 418 099 296 749 097 819 813 361 281 499 909 627 033 732 744 868 163 584 000 ·.
000 000 000 000 000 $a^{30} x^{30}$ +

25 628 669 047 948 734 077 863 514 977 410 900 166 181 975 111 935 650 930 864 567 260 683 756 ·.
511 545 463 131 949 780 930 055 526 914 914 709 881 952 378 083 397 896 277 614 862 336 000 ·.
000 000 000 000 000 $a^{31} x^{31}$ +

788 574 432 244 576 433 165 031 230 074 181 543 574 830 003 444 173 874 795 832 838 790 269 431 ·.
124 475 788 675 377 874 770 939 289 689 683 380 983 150 094 873 781 423 926 611 148 800 000 ·.
000 000 000 000 $a^{32} x^{32}$ +

23 539 535 290 882 878 601 941 230 748 483 031 151 487 462 789 378 324 620 771 129 516 127 445 ·.
705 208 232 497 772 473 873 759 381 781 781 593 462 183 584 921 605 415 639 600 332 800 000 ·.
000 000 000 000 $a^{33} x^{33}$ +

682 305 370 750 228 365 273 658 862 274 870 468 159 056 892 445 748 539 732 496 507 713 839 005 ·.
948 064 710 080 361 561 558 242 950 196 567 926 440 103 910 771 171 467 814 502 400 000 000 ·.
000 000 000 $a^{34} x^{34}$ +

19 219 869 598 597 982 120 384 756 683 799 168 117 156 532 181 570 381 400 915 394 583 488 422 ·.
702 762 386 199 446 804 550 936 421 132 297 688 068 735 321 430 173 844 163 788 800 000 000 ·.
000 000 000 $a^{35} x^{35}$ +

526 571 769 824 602 249 873 554 977 638 333 373 072 781 703 604 667 983 586 723 139 273 655 416 ·.
514 037 978 067 035 741 121 545 784 446 512 001 883 159 491 237 639 566 131 200 000 000 000 ·.
000 000 $a^{36} x^{36}$ +

14 041 913 861 989 393 329 961 466 070 355 556 615 274 178 762 791 146 228 979 283 713 964 144 ·.
440 374 346 081 787 619 763 241 220 918 573 653 383 550 919 766 337 055 096 832 000 000 000 ·.
000 000 $a^{37} x^{37}$ +

364 725 035 376 347 878 700 297 820 009 235 236 760 368 279 553 016 785 168 293 083 479 588 167 ·.
282 450 547 578 899 214 629 642 101 781 133 854 118 205 708 216 546 885 632 000 000 000 000 000
$a^{38} x^{38}$ +

9 233 545 199 401 212 118 994 881 519 221 145 234 439 703 279 823 209 751 096 027 429 862 991 ·.
576 770 899 938 706 309 231 130 179 791 927 439 344 764 701 473 836 630 016 000 000 000 000 000
$a^{39} x^{39}$ +

227 988 770 355 585 484 419 626 704 178 299 882 331 844 525 427 733 574 101 136 479 749 703 495 ·.

722 738 270 091 513 808 176 053 822 022 899 736 907 770 406 761 398 272 000 000 000 000 000
$a^{40}\, x^{40}\ +$

5 493 705 309 773 144 202 882 571 185 019 274 273 056 494 588 620 086 122 918 951 319 269 963
752 355 139 038 349 730 317 495 272 819 828 909 323 078 804 982 202 368 000 000 000 000 000
$a^{41}\, x^{41}\ +$

129 263 654 347 603 393 009 001 674 941 629 982 895 446 931 496 943 202 892 210 619 276 940 323
584 826 800 902 346 595 705 771 125 172 444 925 248 913 058 404 761 600 000 000 000 000
$a^{42}\, x^{42}\ +$

2 971 578 260 864 445 816 298 889 079 117 930 641 274 642 103 378 004 664 188 749 868 435 409
737 582 225 308 099 921 740 362 554 601 665 400 580 434 782 951 833 600 000 000 000 000
$a^{43}\, x^{43}\ +$

66 777 039 569 987 546 433 682 900 654 335 520 028 643 642 772 539 430 655 926 963 335 627 185
114 207 310 294 380 263 828 372 013 520 570 799 560 332 201 164 800 000 000 000 000
$a^{44}\, x^{44}\ +$

1 467 627 243 296 429 591 949 074 739 655 725 714 915 244 896 099 767 706 723 669 523 859 938
134 378 182 643 832 533 270 953 231 066 386 171 418 908 400 025 600 000 000 000 000
$a^{45}\, x^{45}\ +$

31 561 876 199 923 217 031 162 897 627 004 854 084 198 814 969 887 477 563 949 882 233 547 056
653 294 250 405 000 715 504 370 560 567 444 546 643 191 398 400 000 000 000 000
$a^{46}\, x^{46}\ +$

664 460 551 577 330 884 866 587 318 463 260 085 983 132 946 734 473 211 872 629 099 653 622 245
332 510 534 842 120 326 407 801 275 104 095 718 804 029 440 000 000 000 000 $a^{47}\, x^{47}\ +$

13 700 217 558 295 482 162 197 676 669 345 568 783 157 380 345 040 684 780 878 950 508 322 108
151 185 784 223 548 872 709 439 201 548 538 056 057 815 040 000 000 000 000 $a^{48}\, x^{48}\ +$

276 772 071 884 757 215 397 932 862 006 981 187 538 532 936 263 448 177 391 493 949 663 072 891
943 147 156 031 290 357 766 448 516 132 081 940 561 920 000 000 000 000 $a^{49}\, x^{49}\ +$

5 480 635 086 826 875 552 434 314 099 148 142 327 495 701 708 187 092 621 613 741 577 486 591
919 666 280 317 451 294 213 197 000 319 447 167 139 840 000 000 000 000 $a^{50}\, x^{50}\ +$

106 420 098 773 337 389 367 656 584 449 478 491 796 033 042 877 419 274 206 092 069 465 759 066
401 286 996 455 364 936 178 582 530 474 702 274 560 000 000 000 000 $a^{51}\, x^{51}\ +$

2 027 049 500 444 521 702 241 077 799 037 685 558 019 677 007 188 938 556 306 515 608 871 601
264 786 418 980 102 189 260 544 429 151 899 090 944 000 000 000 000 $a^{52}\, x^{52}\ +$

37 888 775 709 243 396 303 571 547 645 564 216 037 750 972 096 989 505 725 355 431 941 525 257
285 727 457 572 003 537 580 269 703 773 814 784 000 000 000 000 $a^{53}\, x^{53}\ +$

695 206 893 747 585 253 276 542 158 634 205 798 857 816 001 779 623 958 263 402 420 945 417 564
875 733 166 458 780 506 059 994 564 657 152 000 000 000 000 $a^{54}\, x^{54}\ +$

12 526 250 337 794 328 887 865 624 479 895 599 979 420 108 140 173 404 653 394 638 215 232 748
916 679 876 873 131 180 289 369 271 435 264 000 000 000 000 $a^{55}\, x^{55}\ +$

221 703 545 801 669 537 838 329 636 812 311 504 060 532 887 436 697 427 493 710 410 889 075 202
065 130 564 126 215 580 342 818 963 456 000 000 000 000 $a^{56}\, x^{56}\ +$

3 855 713 840 029 035 440 666 602 379 344 547 896 704 919 781 507 781 347 716 702 798 070 873
079 393 575 028 282 010 092 918 590 668 800 000 000 000 $a^{57}\, x^{57}\ +$

65 909 638 291 094 622 917 377 818 450 334 152 080 425 979 171 073 185 431 054 748 684 972 189
391 343 162 876 615 557 143 907 532 800 000 000 000 $a^{58}\, x^{58}\ +$

1 107 725 013 295 707 948 191 223 839 501 414 320 679 428 221 362 574 545 059 743 675 377 683
855 316 691 813 052 362 304 939 622 400 000 000 000 $a^{59}\, x^{59}\ +$

18 309 504 351 995 172 697 375 600 652 915 939 184 783 937 543 183 050 331 566 011 163 267 501
740 771 765 504 997 724 048 588 800 000 000 000 $a^{60}\, x^{60}\ +$

297 715 517 918 620 694 266 269 929 315 706 328 207 868 903 141 187 810 269 366 035 175 081 329
118 240 089 512 158 114 611 200 000 000 000 $a^{61}\, x^{61}\ +$

4 763 448 286 697 931 108 260 318 869 051 301 251 325 902 450 259 004 964 309 856 562 801 301

265 891 841 432 194 529 833 779 200 000 000 a^{62} x^{62} +

75 014 933 648 786 316 665 516 832 583 485 059 075 998 463 783 606 377 390 706 402 563 800 019 935 304 589 483 378 422 579 200 000 000 a^{63} x^{63} +

1 163 022 227 112 966 149 852 974 148 581 163 706 604 627 345 482 269 416 910 176 783 934 884 030 004 722 317 571 758 489 600 000 000 a^{64} x^{64} +

17 756 064 536 075 819 081 724 796 161 544 484 070 299 654 129 500 296 441 376 744 792 898 992 824 499 577 367 507 763 200 000 000 a^{65} x^{65} +

267 008 489 264 298 031 304 132 273 105 932 091 282 701 565 857 147 314 907 920 974 329 308 162 774 429 734 849 740 800 000 000 a^{66} x^{66} +

3 955 681 322 434 044 908 209 367 008 976 771 722 706 689 864 550 330 591 228 458 878 952 713 522 584 144 219 996 160 000 000 a^{67} x^{67} +

57 747 172 590 278 027 857 071 051 225 938 273 324 185 253 497 085 118 120 123 487 283 981 219 307 797 725 839 360 000 000 a^{68} x^{68} +

830 894 569 644 288 170 605 338 866 560 262 925 527 845 374 058 778 677 987 388 306 244 334 090 759 679 508 480 000 000 a^{69} x^{69} +

11 785 738 576 514 725 824 189 203 780 996 637 241 529 721 617 855 016 709 040 968 882 898 355 897 300 418 560 000 000 a^{70} x^{70} +

164 835 504 566 639 522 016 632 220 713 239 681 699 716 386 263 706 527 399 174 389 970 606 376 186 019 840 000 000 a^{71} x^{71} +

2 273 593 166 436 407 200 229 409 940 872 271 471 720 226 017 430 434 860 678 267 447 870 432 774 979 584 000 000 a^{72} x^{72} +

30 933 240 359 679 009 526 930 747 494 860 836 349 935 047 856 196 392 662 289 353 032 250 786 054 144 000 000 a^{73} x^{73} +

415 211 279 995 691 403 046 050 301 944 440 756 374 967 085 318 072 384 728 716 148 083 903 168 512 000 000 a^{74} x^{74} +

5 499 487 152 260 813 285 378 149 694 628 354 389 072 411 726 067 183 903 691 604 610 382 823 424 000 000 a^{75} x^{75} +

71 888 720 944 585 794 580 106 531 955 926 201 164 345 251 321 139 658 871 785 681 181 474 816 000 000 a^{76} x^{76} +

927 596 399 284 977 994 582 019 767 173 241 305 346 390 339 627 608 501 571 428 144 277 094 400 000 a^{77} x^{77} +

11 816 514 640 572 968 083 847 385 569 085 876 501 227 902 415 638 324 860 782 524 130 918 400 000 a^{78} x^{78} +

148 635 404 283 936 705 457 199 818 479 067 628 946 262 923 467 148 740 387 201 561 395 200 000 a^{79} x^{79} +

1 846 402 537 688 654 726 176 395 260 609 535 763 307 613 956 113 648 948 909 336 166 400 000 a^{80} x^{80} + 22 655 245 861 210 487 437 747 181 111 773 444 948 559 680 443 112 257 041 832 345 600 000 a^{81} x^{81} +

274 609 040 741 945 302 275 723 407 415 435 696 346 177 944 764 997 055 052 513 280 000 a^{82} x^{82} +

3 288 731 026 849 644 338 631 418 052 879 469 417 319 496 344 490 982 695 239 680 000 a^{83} x^{83} +

38 919 893 808 871 530 634 691 337 903 899 046 358 810 607 627 112 221 245 440 000 a^{84} x^{84} +

455 203 436 361 070 533 739 079 975 484 199 372 617 667 925 463 300 833 280 000 a^{85} x^{85} +

5 262 467 472 382 318 309 122 311 855 308 663 267 256 276 594 951 454 720 000 a^{86} x^{86} +

60 142 485 398 655 066 389 969 278 346 384 723 054 357 446 799 445 196 800 a^{87} x^{87} +

679 576 106 199 492 275 592 873 201 654 064 667 280 875 105 078 476 800 a^{88} x^{88} +

7 593 029 119 547 399 727 294 672 644 179 493 489 171 788 883 558 400 a^{89} x^{89} +

83 900 874 249 142 538 423 145 554 079 331 419 769 854 020 812 800 a^{90} x^{90} +

916 949 445 345 820 092 056 235 563 708 540 106 774 360 883 200 a^{91} x^{91} +

9 912 966 976 711 568 562 770 114 202 254 487 640 803 901 440 a^{92} x^{92} +

106 021 037 184 080 947 195 402 290 933 203 076 372 234 240 a^{93} x^{93} +

1 121 915 737 397 681 980 903 727 946 383 101 337 272 320 a^{94} x^{94} +

$$11\,747\,808\,768\,562\,114\,983\,285\,109\,386\,210\,485\,207\,040\ a^{95}\ x^{95} +$$
$$121\,738\,950\,969\,555\,595\,681\,710\,978\,095\,445\,442\,560\ a^{96}\ x^{96} +$$
$$1\,248\,604\,625\,328\,775\,340\,325\,240\,800\,978\,927\,616\ a^{97}\ x^{97} +$$
$$12\,676\,189\,089\,632\,236\,957\,616\,657\,877\,958\,656\ a^{98}\ x^{98} +$$
$$127\,398\,885\,322\,937\,054\,850\,418\,672\,140\,288\ a^{99}\ x^{99} +$$
$$1\,267\,650\,600\,228\,229\,401\,496\,703\,205\,376\ a^{100}\ x^{100}\big) +$$
$$1\,339\,928\,042\,684\,663\,702\,626\,654\,216\,353\,741\,866\,828\,222\,367\,324\,552\,136\,009\,000\,175\,903\,930\,373$$
$$973\,956\,200\,201\,339\,808\,971\,908\,813\,302\,485\,337\,859\,343\,555\,595\,880\,232\,757\,068\,702\,494\,068\,539$$
$$027\,184\,400\,769\,291\,974\,725\,364\,464\,819\,431\,304\,931\,640\,625\ e^{ax}\ \sqrt{\pi}\ \text{Erf}\big[\sqrt{a\,x}\,\big]\big) +$$
$$\frac{1}{101}\ x^{101}\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big]$$

Problem 61: Result more than twice size of optimal antiderivative.

$$\int x^2\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big]\ dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{3}\ x^3\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big] - \frac{\text{Gamma}\big[\frac{7}{2},\ a\,x\big]}{3\ a^3}$$

Result (type 4, 67 leaves):

$$\frac{1}{24}\left(-\frac{2\ e^{-ax}\ \sqrt{a\,x}\ \left(15 + 10\ a\,x + 4\ a^2\ x^2\right)}{a^3} + \frac{15\ \sqrt{\pi}\ \text{Erf}\big[\sqrt{a\,x}\,\big]}{a^3} + 8\ x^3\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big]\right)$$

Problem 63: Result more than twice size of optimal antiderivative.

$$\int \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big]\ dx$$

Optimal (type 4, 22 leaves, 1 step):

$$x\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big] - \frac{\text{Gamma}\big[\frac{3}{2},\ a\,x\big]}{a}$$

Result (type 4, 50 leaves):

$$\frac{2\left(-\frac{1}{2}\ e^{-ax}\ \sqrt{a\,x}\ + \frac{1}{4}\ \sqrt{\pi}\ \text{Erf}\big[\sqrt{a\,x}\,\big]\right)}{a} + x\ \text{Gamma}\Big[\frac{1}{2},\ a\,x\Big]$$

Problem 65: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}\big[\frac{1}{2},\ a\,x\big]}{x^2}\ dx$$

Optimal (type 4, 22 leaves, 1 step):

$$a \, \text{Gamma}\left[-\frac{1}{2}, \, a \, x\right] - \frac{\text{Gamma}\left[\frac{1}{2}, \, a \, x\right]}{x}$$

Result (type 4, 47 leaves):

$$-2 \, a \left(-\frac{e^{-a \, x}}{\sqrt{a \, x}} - \sqrt{\pi} \, \text{Erf}\left[\sqrt{a \, x}\right]\right) - \frac{\text{Gamma}\left[\frac{1}{2}, \, a \, x\right]}{x}$$

Problem 67: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}\left[\frac{1}{2}, \, a \, x\right]}{x^4} \, dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{3} \, a^3 \, \text{Gamma}\left[-\frac{5}{2}, \, a \, x\right] - \frac{\text{Gamma}\left[\frac{1}{2}, \, a \, x\right]}{3 \, x^3}$$

Result (type 4, 67 leaves):

$$\frac{1}{45 \, x^3}\left(2 \, e^{-a \, x} \, \sqrt{a \, x} \, \left(3 - 2 \, a \, x + 4 \, a^2 \, x^2\right) + 8 \, a^3 \, \sqrt{\pi} \, x^3 \, \text{Erf}\left[\sqrt{a \, x}\right] - 15 \, \text{Gamma}\left[\frac{1}{2}, \, a \, x\right]\right)$$

Problem 68: Result more than twice size of optimal antiderivative.

$$\int x^{100} \, \text{Gamma}\left[\frac{3}{2}, \, a \, x\right] \, dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{101} \, x^{101} \, \text{Gamma}\left[\frac{3}{2}, \, a \, x\right] - \frac{\text{Gamma}\left[\frac{205}{2}, \, a \, x\right]}{101 \, a^{101}}$$

Result (type 4, 864 leaves):

$$\frac{1}{512\,130\,842\,492\,204\,678\,204\,668\,094\,971\,904 \, a^{101}} \, e^{-a \, x} \left(-2 \, \sqrt{a \, x}\right.$$

$$\left(272\,005\,392\,664\,986\,731\,633\,210\,805\,919\,809\,598\,966\,129\,140\,566\,884\,083\,609\,827\,035\,708\,497\,865 \right.$$
$$916\,713\,108\,640\,871\,981\,221\,297\,489\,100\,404\,523\,585\,446\,741\,785\,963\,687\,249\,684\,946\,606\,295\,913 \right.$$
$$422\,518\,433\,356\,166\,270\,869\,248\,986\,358\,344\,554\,901\,123\,046\,875 +$$
$$181\,336\,928\,443\,324\,487\,755\,473\,870\,613\,206\,399\,310\,752\,760\,377\,922\,722\,406\,551\,357\,138\,998\,577 \right.$$
$$277\,808\,739\,093\,914\,654\,147\,531\,659\,400\,269\,682\,390\,297\,827\,857\,309\,124\,833\,123\,297\,737\,530 \right.$$
$$608\,948\,345\,622\,237\,444\,180\,579\,499\,324\,238\,896\,369\,934\,082\,031\,250 \, a \, x +$$
$$72\,534\,771\,377\,329\,795\,102\,189\,548\,245\,282\,559\,724\,301\,104\,151\,169\,088\,962\,620\,542\,855\,599\,430 \right.$$
$$911\,123\,495\,637\,565\,861\,659\,012\,663\,760\,107\,872\,956\,119\,131\,142\,923\,649\,933\,249\,319\,095\,012 \right.$$
$$243\,579\,338\,248\,894\,977\,672\,231\,799\,729\,695\,558\,547\,973\,632\,812\,500 \, a^2 \, x^2 +$$
$$20\,724\,220\,393\,522\,798\,600\,625\,585\,212\,937\,874\,206\,943\,172\,614\,619\,739\,703\,605\,869\,387\,314\,123 \right.$$
$$117\,463\,855\,896\,447\,389\,045\,432\,189\,645\,745\,106\,558\,891\,180\,326\,549\,614\,266\,642\,662\,598\,574 \right.$$
$$926\,736\,953\,785\,398\,565\,049\,209\,085\,637\,055\,873\,870\,849\,609\,375\,000 \, a^3 \, x^3 +$$
$$4\,605\,382\,309\,671\,733\,022\,361\,241\,158\,430\,638\,712\,654\,038\,358\,804\,386\,600\,801\,304\,308\,292\,027 \right.$$
$$359\,436\,412\,421\,432\,753\,121\,207\,153\,254\,610\,023\,679\,753\,595\,628\,122\,136\,503\,698\,369\,466\,349 \right.$$

983 719 323 063 421 903 344 268 685 697 123 527 526 855 468 750 000 $a^4 x^4 +$

837 342 238 122 133 276 792 952 937 896 479 765 937 097 883 418 979 381 963 873 510 598 550 428
988 438 622 078 682 385 674 027 864 474 549 759 955 199 205 113 115 727 945 158 084 790 906
130 786 011 531 255 153 503 397 399 477 005 004 882 812 500 000 $a^5 x^5 +$

128 821 882 788 020 504 121 992 759 676 381 502 451 861 212 833 689 135 686 749 770 861 315 450
613 605 941 858 258 828 565 235 056 073 007 655 377 722 954 632 787 035 068 485 859 198 600
943 197 847 927 885 408 231 291 907 611 846 923 828 125 000 000 $a^6 x^6 +$

17 176 251 038 402 733 882 932 367 956 850 866 993 581 495 044 491 884 758 233 302 781 508 726
748 480 792 247 767 843 808 698 007 476 401 020 717 029 727 284 371 604 675 798 114 559 813
459 093 046 390 384 721 097 505 587 681 579 589 843 750 000 000 $a^7 x^7 +$

2 020 735 416 282 674 574 462 631 524 335 396 116 891 940 593 469 633 500 968 623 856 648 085
499 821 269 676 207 981 624 552 706 761 929 531 849 062 320 856 984 894 667 740 954 654 095
701 069 770 163 574 673 070 294 775 021 362 304 687 500 000 000 $a^8 x^8 +$

212 708 991 187 649 955 206 592 792 035 304 854 409 677 957 207 329 842 207 223 563 857 693 210
507 502 071 179 787 539 426 600 711 782 055 984 111 823 248 103 673 122 920 100 489 904 810
638 923 175 113 123 481 083 660 528 564 453 125 000 000 000 $a^9 x^9 +$

20 257 999 160 728 567 162 532 646 860 505 224 229 493 138 781 650 461 162 592 720 367 399 353
381 666 863 921 884 527 564 438 163 026 862 474 677 316 499 819 397 440 278 104 808 562 362
917 992 683 344 106 998 198 443 859 863 281 250 000 000 000 $a^{10} x^{10} +$

1 761 565 144 411 179 753 263 708 422 652 628 193 868 968 589 708 735 753 268 932 205 860 813
337 536 249 036 685 611 092 559 840 263 205 432 580 636 217 375 599 777 415 487 374 657 596
775 477 624 638 617 999 843 342 944 335 937 500 000 000 000 $a^{11} x^{11} +$

140 925 211 552 894 380 261 096 673 812 210 255 509 517 487 176 698 860 261 514 576 468 865 067
002 899 922 934 848 887 404 787 221 056 434 606 450 897 390 047 982 193 238 989 972 607 742
038 209 971 089 439 987 467 435 546 875 000 000 000 000 $a^{12} x^{12} +$

10 438 904 559 473 657 797 118 272 134 237 796 704 408 702 753 829 545 204 556 635 293 990 004
963 177 772 069 248 065 733 687 942 300 476 637 514 881 288 151 702 384 684 369 627 600 573
484 311 849 710 328 887 960 550 781 250 000 000 000 000 $a^{13} x^{13} +$

719 924 452 377 493 641 180 570 492 016 399 772 717 841 569 229 623 807 210 802 434 068 276 204
357 087 728 913 659 705 771 582 227 619 078 449 302 157 803 565 681 702 370 319 144 867 136
849 093 083 470 957 790 382 812 500 000 000 000 000 $a^{14} x^{14} +$

46 446 738 863 064 105 882 617 451 097 832 243 401 151 068 982 556 374 658 761 447 359 243 626
087 554 047 026 687 722 953 005 305 007 682 480 600 139 213 133 269 787 249 698 009 346 266
893 489 876 352 965 018 734 375 000 000 000 000 000 $a^{15} x^{15} +$

2 814 953 870 488 733 689 855 603 096 838 317 781 887 943 574 700 386 342 955 239 233 893 553
096 215 396 789 496 225 633 515 473 030 768 635 187 887 225 038 379 987 106 042 303 596 743
448 090 295 536 543 334 468 750 000 000 000 000 000 $a^{16} x^{16} +$

160 854 506 885 070 496 563 177 319 819 332 444 679 311 061 411 450 648 168 870 813 365 345 891
212 308 387 971 212 893 343 741 316 043 922 010 736 412 859 335 999 263 202 417 348 385 339
890 874 030 659 619 112 500 000 000 000 000 000 $a^{17} x^{17} +$

8 694 838 210 003 810 625 036 611 882 126 078 090 773 570 887 105 440 441 560 584 506 234 913
038 503 156 106 552 048 288 850 881 948 320 108 688 454 749 153 297 257 470 400 937 750 558
913 020 217 873 492 925 000 000 000 000 000 000 $a^{18} x^{18} +$

445 889 138 974 554 391 027 518 558 057 747 594 398 644 660 877 202 073 926 183 820 832 559 643
000 161 851 618 053 758 402 609 330 683 082 496 843 833 289 912 679 870 276 971 166 695 328
872 831 685 820 150 000 000 000 000 000 000 $a^{19} x^{19} +$

21 750 689 706 075 823 952 561 880 880 865 736 312 129 007 847 668 393 850 057 747 357 685 836
243 910 334 225 270 915 044 029 723 447 955 243 748 479 672 678 667 310 745 218 105 692 455
066 967 399 308 300 000 000 000 000 000 000 $a^{20} x^{20} +$

1 011 659 986 329 108 090 816 831 668 877 476 107 540 884 085 938 064 830 235 244 063 148 178
429 949 317 870 942 833 257 861 847 602 230 476 453 417 659 194 356 619 104 428 749 101 974

654 277 553 456 200 000 000 000 000 000 000 000 $a^{21} x^{21}$ +

44 962 666 059 071 470 702 970 296 394 554 493 668 483 737 152 802 881 343 788 625 028 807 930 219 969 683 153 014 811 460 526 560 099 132 286 818 562 630 860 294 182 419 055 515 643 317 967 891 264 720 000 000 000 000 000 000 000 $a^{22} x^{22}$ +

1 913 304 938 683 892 370 339 161 548 704 446 539 084 414 346 927 782 184 842 069 150 162 039 583 828 497 155 447 438 785 554 321 706 346 054 758 236 707 696 182 731 166 768 319 814 609 275 229 415 520 000 000 000 000 000 000 000 $a^{23} x^{23}$ +

78 094 079 129 954 790 626 088 226 477 732 511 799 363 850 895 011 517 748 655 883 680 083 248 319 530 496 140 711 787 165 482 518 626 369 581 968 845 212 089 091 068 031 359 992 433 031 642 016 960 000 000 000 000 000 000 000 $a^{24} x^{24}$ +

3 062 512 907 057 050 612 787 773 587 362 059 286 249 562 780 196 530 107 790 426 810 983 656 796 844 333 181 988 697 535 901 275 240 249 787 528 190 008 317 219 257 569 857 254 605 216 927 137 920 000 000 000 000 000 000 000 $a^{25} x^{25}$ +

115 566 524 794 605 683 501 425 418 391 021 105 141 492 935 101 755 853 124 167 049 471 081 388 560 163 516 301 460 284 373 633 027 933 954 246 346 792 766 687 519 153 579 519 041 706 299 137 280 000 000 000 000 000 000 000 $a^{26} x^{26}$ +

4 202 419 083 440 206 672 779 106 123 309 858 368 781 561 276 427 485 568 151 529 071 675 686 856 733 218 774 598 555 795 404 837 379 416 518 048 974 282 425 000 696 493 800 692 425 683 604 992 000 000 000 000 000 000 000 $a^{27} x^{27}$ +

147 453 301 173 340 585 009 793 197 309 117 837 501 107 413 207 981 949 759 702 774 444 760 942 341 516 448 231 528 273 522 976 750 154 965 545 578 044 997 368 445 491 010 550 611 427 494 912 000 000 000 000 000 000 $a^{28} x^{28}$ +

4 998 416 988 926 799 491 857 396 518 953 147 033 935 844 515 524 811 856 261 110 998 127 489 570 898 862 651 916 212 661 795 822 039 151 374 426 374 406 690 455 779 356 289 851 234 830 336 000 000 000 000 000 000 $a^{29} x^{29}$ +

163 882 524 227 108 180 060 898 246 523 054 001 112 650 639 853 272 519 877 413 475 348 442 281 013 077 463 997 252 874 157 240 066 857 422 112 340 144 481 654 287 847 747 208 237 207 552 000 000 000 000 000 000 $a^{30} x^{30}$ +

5 202 619 816 733 593 017 806 293 540 414 412 733 734 940 947 722 937 138 965 507 153 918 802 571 843 729 015 785 805 528 801 271 963 727 686 106 036 332 750 929 772 944 355 817 054 208 000 000 000 000 000 000 $a^{31} x^{31}$ +

160 080 609 745 649 015 932 501 339 705 058 853 345 690 490 699 167 296 583 554 066 274 424 694 518 268 585 101 101 708 578 500 675 807 005 726 339 579 469 259 377 629 057 102 063 206 400 000 000 000 000 000 $a^{32} x^{32}$ +

4 778 525 664 049 224 356 194 069 841 942 055 323 751 954 946 243 799 898 016 539 291 773 871 478 157 271 197 047 812 196 373 154 501 701 663 472 823 267 739 085 899 374 838 867 558 400 000 000 000 000 000 $a^{33} x^{33}$ +

138 507 990 262 296 358 150 552 749 041 798 705 036 288 549 166 486 953 565 696 791 065 909 318 207 457 136 146 313 396 996 323 318 889 903 289 067 341 093 886 547 807 966 343 987 200 000 000 000 000 000 $a^{34} x^{34}$ +

3 901 633 528 515 390 370 438 105 606 811 231 127 782 776 032 858 787 424 385 825 100 448 149 808 660 764 398 487 701 323 840 093 489 856 430 677 953 270 250 325 290 365 249 126 400 000 000 000 000 $a^{35} x^{35}$ +

106 894 069 274 394 256 724 331 660 460 581 674 733 774 685 831 747 600 668 104 797 272 552 049 552 349 709 547 608 255 447 673 794 242 641 936 382 281 376 721 240 831 924 633 600 000 000 000 000 000 $a^{36} x^{36}$ +

2 850 508 513 983 846 845 982 177 612 282 177 992 900 658 288 846 602 684 482 794 593 934 721 321 395 992 254 602 886 811 937 967 846 470 451 636 860 836 712 566 422 184 656 896 000 000 000 000 $a^{37} x^{37}$ +

74 039 182 181 398 619 376 160 457 461 874 753 062 354 760 749 262 407 389 163 495 946 356 397 958 337 461 158 516 540 569 817 346 661 570 172 385 995 758 767 959 017 783 296 000 000 000 000

$000\,000\,a^{38}\,x^{38}\,+$

$1\,874\,409\,675\,478\,446\,060\,155\,960\,948\,401\,892\,482\,591\,259\,765\,804\,111\,579\,472\,493\,568\,262\,187$ $290\,084\,492\,687\,557\,380\,773\,919\,426\,497\,761\,270\,186\,987\,234\,399\,188\,835\,893\,248\,000\,000\,000$ $000\,000\,a^{39}\,x^{39}\,+$

$46\,281\,720\,382\,183\,853\,337\,184\,220\,948\,194\,876\,113\,364\,438\,661\,829\,915\,542\,530\,705\,389\,189\,809$ $631\,715\,868\,828\,577\,303\,059\,738\,925\,870\,648\,646\,592\,277\,392\,572\,563\,849\,216\,000\,000\,000\,000\,000$ $a^{40}\,x^{40}\,+$

$1\,115\,222\,177\,883\,948\,273\,185\,161\,950\,558\,912\,677\,430\,468\,401\,489\,877\,482\,952\,547\,117\,811\,802$ $641\,728\,093\,224\,784\,995\,254\,451\,540\,382\,425\,268\,592\,584\,997\,411\,387\,080\,704\,000\,000\,000\,000\,000$ $a^{41}\,x^{41}\,+$

$26\,240\,521\,832\,563\,488\,780\,827\,340\,013\,150\,886\,527\,775\,727\,093\,879\,470\,187\,118\,755\,713\,218\,885$ $687\,719\,840\,583\,176\,358\,928\,271\,538\,410\,006\,319\,825\,529\,350\,856\,166\,604\,800\,000\,000\,000\,000$ $a^{42}\,x^{42}\,+$

$603\,230\,386\,955\,482\,500\,708\,674\,483\,060\,939\,920\,178\,752\,346\,985\,734\,946\,830\,316\,223\,292\,388\,176$ $729\,191\,737\,544\,284\,113\,293\,598\,584\,138\,076\,317\,828\,260\,939\,222\,220\,800\,000\,000\,000\,000$ $a^{43}\,x^{43}\,+$

$13\,555\,739\,032\,707\,471\,926\,037\,628\,832\,830\,110\,565\,814\,659\,482\,825\,504\,423\,153\,173\,557\,132\,318$ $578\,184\,083\,989\,759\,193\,557\,159\,518\,744\,675\,872\,310\,747\,436\,836\,454\,400\,000\,000\,000\,000$ $a^{44}\,x^{44}\,+$

$297\,928\,330\,389\,175\,207\,165\,662\,172\,150\,112\,320\,127\,794\,713\,908\,252\,844\,464\,904\,913\,343\,567\,441$ $278\,771\,076\,698\,004\,254\,003\,505\,906\,476\,392\,798\,038\,405\,205\,196\,800\,000\,000\,000\,000$ $a^{45}\,x^{45}\,+$

$6\,407\,060\,868\,584\,413\,057\,326\,068\,218\,281\,985\,379\,092\,359\,438\,887\,157\,945\,481\,826\,093\,410\,052$ $500\,618\,732\,832\,215\,145\,247\,387\,223\,795\,191\,242\,968\,567\,853\,875\,200\,000\,000\,000\,000$ $a^{46}\,x^{46}\,+$

$134\,885\,491\,970\,198\,169\,627\,917\,225\,648\,041\,797\,454\,575\,988\,187\,098\,062\,010\,143\,707\,229\,685\,315$ $802\,499\,638\,572\,950\,426\,260\,783\,658\,846\,131\,430\,917\,217\,976\,320\,000\,000\,000\,000$ $a^{47}\,x^{47}\,+$

$2\,781\,144\,164\,333\,982\,878\,926\,128\,363\,877\,150\,462\,980\,948\,210\,043\,259\,010\,518\,426\,953\,189\,387$ $954\,690\,714\,197\,380\,421\,160\,016\,157\,914\,353\,225\,379\,736\,453\,120\,000\,000\,000\,000$ $a^{48}\,x^{48}\,+$

$56\,184\,730\,592\,605\,714\,725\,780\,370\,987\,417\,181\,070\,322\,186\,061\,479\,980\,010\,473\,271\,781\,603\,797$ $064\,458\,872\,674\,351\,942\,626\,589\,048\,774\,812\,633\,934\,069\,760\,000\,000\,000\,000\,a^{49}\,x^{49}\,+$

$1\,112\,568\,922\,625\,855\,737\,144\,165\,762\,127\,072\,892\,481\,627\,446\,761\,979\,802\,187\,589\,540\,229\,778$ $159\,692\,254\,904\,442\,612\,725\,278\,991\,064\,847\,774\,929\,387\,520\,000\,000\,000\,000\,a^{50}\,x^{50}\,+$

$21\,603\,280\,050\,987\,490\,041\,634\,286\,643\,244\,133\,834\,594\,707\,704\,116\,112\,663\,836\,690\,101\,549\,090$ $479\,461\,260\,280\,439\,082\,044\,252\,253\,686\,364\,561\,735\,680\,000\,000\,000\,000\,a^{51}\,x^{51}\,+$

$411\,491\,048\,590\,237\,905\,554\,938\,793\,204\,650\,168\,277\,994\,432\,459\,354\,526\,930\,222\,668\,600\,935\,056$ $751\,643\,052\,960\,744\,419\,890\,519\,117\,835\,515\,461\,632\,000\,000\,000\,000\,a^{52}\,x^{52}\,+$

$7\,691\,421\,468\,976\,409\,449\,625\,024\,172\,049\,535\,855\,663\,447\,335\,688\,869\,662\,247\,152\,684\,129\,627$ $229\,002\,673\,887\,116\,718\,128\,794\,749\,866\,084\,401\,152\,000\,000\,000\,000\,a^{53}\,x^{53}\,+$

$141\,126\,999\,430\,759\,806\,415\,138\,058\,202\,743\,777\,168\,136\,648\,361\,263\,663\,527\,470\,691\,451\,919\,765$ $669\,773\,832\,791\,132\,442\,730\,178\,896\,625\,401\,856\,000\,000\,000\,000\,a^{54}\,x^{54}\,+$

$2\,542\,828\,818\,572\,248\,764\,236\,721\,769\,418\,806\,795\,822\,281\,952\,455\,201\,144\,639\,111\,557\,692\,248$ $030\,086\,015\,005\,245\,629\,598\,741\,962\,101\,358\,592\,000\,000\,000\,000\,a^{55}\,x^{55}\,+$

$45\,005\,819\,797\,738\,916\,181\,180\,916\,272\,899\,235\,324\,288\,176\,149\,649\,577\,781\,223\,213\,410\,482\,266$ $019\,221\,504\,517\,621\,762\,809\,592\,249\,581\,568\,000\,000\,000\,000\,a^{56}\,x^{56}\,+$

$782\,709\,909\,525\,894\,194\,455\,320\,283\,006\,943\,223\,031\,098\,715\,646\,079\,613\,586\,490\,668\,008\,387\,235$ $116\,895\,730\,741\,248\,048\,862\,473\,905\,766\,400\,000\,000\,000\,000\,a^{57}\,x^{57}\,+$

$13\,379\,656\,573\,092\,208\,452\,227\,697\,145\,417\,832\,872\,326\,473\,771\,727\,856\,642\,504\,113\,983\,049\,354$ $446\,442\,662\,063\,952\,958\,100\,213\,229\,158\,400\,000\,000\,000\,000\,a^{58}\,x^{58}\,+$

224 868 177 699 028 713 482 818 439 418 787 107 097 923 928 936 602 632 647 127 966 101 669 822 ⹁
629 288 438 049 629 547 902 743 347 200 000 000 000 a^{59} x^{59} +

3 716 829 383 455 020 057 567 246 932 541 935 654 511 139 321 266 159 217 307 900 266 143 302 ⹁
853 376 668 397 514 537 981 863 526 400 000 000 000 a^{60} x^{60} +

60 436 250 137 480 000 936 052 795 651 088 384 626 197 387 337 661 125 484 681 305 140 541 509 ⹁
811 002 738 170 968 097 266 073 600 000 000 000 a^{61} x^{61} +

966 980 002 199 680 014 976 844 730 417 414 154 019 158 197 402 578 007 754 900 882 248 664 156 ⹁
976 043 810 735 489 556 257 177 600 000 000 a^{62} x^{62} +

15 228 031 530 703 622 283 099 917 014 447 466 992 427 688 148 072 094 610 313 399 720 451 404 ⹁
046 866 831 665 125 819 783 577 600 000 000 a^{63} x^{63} +

236 093 512 103 932 128 420 153 752 161 976 232 440 739 351 132 900 691 632 765 887 138 781 458 ⹁
090 958 630 467 066 973 388 800 000 000 a^{64} x^{64} +

3 604 481 100 823 391 273 590 133 620 793 530 266 270 829 788 288 560 177 599 479 192 958 495 ⹁
543 373 414 205 604 075 929 600 000 000 a^{65} x^{65} +

54 202 723 320 652 500 354 738 851 440 504 214 530 388 417 869 000 904 926 307 957 788 849 557 ⹁
043 209 236 174 497 382 400 000 000 a^{66} x^{66} +

803 003 308 454 111 116 366 501 502 822 284 659 709 458 042 503 717 110 019 377 152 427 400 845 ⹁
084 581 276 659 220 480 000 000 a^{67} x^{67} +

11 722 676 035 826 439 654 985 423 398 865 469 484 809 606 459 908 278 978 385 067 918 648 187 ⹁
519 482 938 345 390 080 000 000 a^{68} x^{68} +

168 671 597 637 790 498 632 883 789 911 733 373 882 152 610 933 932 071 631 439 826 167 599 820 ⹁
424 214 940 221 440 000 000 a^{69} x^{69} +

2 392 504 931 032 489 342 310 408 367 542 317 360 030 533 488 424 568 391 935 316 683 228 366 ⹁
247 151 984 967 680 000 000 a^{70} x^{70} +

33 461 607 427 027 822 969 376 340 804 787 655 385 042 426 411 532 425 062 032 401 164 033 094 ⹁
365 762 027 520 000 000 a^{71} x^{71} +

461 539 412 786 590 661 646 570 217 997 071 108 759 205 881 538 378 276 717 688 291 917 697 853 ⹁
320 855 552 000 000 a^{72} x^{72} +

6 279 447 793 014 838 933 966 941 741 456 749 779 036 814 714 807 867 710 444 738 665 546 909 ⹁
568 991 232 000 000 a^{73} x^{73} +

84 287 889 839 125 354 818 348 211 294 721 473 544 118 318 319 568 694 099 929 378 061 032 343 ⹁
207 936 000 000 a^{74} x^{74} +

1 116 395 891 908 945 096 931 764 388 009 555 940 981 699 580 391 638 332 449 395 735 907 713 ⹁
155 072 000 000 a^{75} x^{75} +

14 593 410 351 750 916 299 761 625 987 053 018 836 362 086 018 191 350 750 972 493 279 839 387 ⹁
648 000 000 a^{76} x^{76} +

188 302 069 054 850 532 900 150 012 736 167 984 985 317 238 944 404 525 818 999 913 288 250 163 ⹁
200 000 a^{77} x^{77} +

2 398 752 472 036 312 521 021 019 270 524 432 929 749 264 190 374 579 946 738 852 398 576 435 ⹁
200 000 a^{78} x^{78} +

30 172 987 069 639 151 207 811 563 151 250 728 676 091 373 463 831 194 298 601 916 963 225 600 ⹁
000 a^{79} x^{79} +

374 819 715 150 796 909 413 808 237 903 735 759 951 445 633 091 070 736 628 595 241 779 200 000
a^{80} x^{80} +

4 599 014 909 825 728 949 862 677 765 690 009 324 557 615 129 951 788 179 491 966 156 800 000 a^{81}
x^{81} + 55 745 635 270 614 896 361 971 851 705 333 446 358 274 122 787 294 402 175 660 195 840 000
a^{82} x^{82} +

667 612 398 450 477 800 742 177 864 734 532 291 715 857 757 931 669 487 133 655 040 000 a^{83} x^{83} +

7 900 738 443 200 920 718 842 341 594 491 506 410 838 553 348 303 780 912 824 320 000 a^{84} x^{84} +

92 406 297 581 297 318 349 033 235 023 292 472 641 386 588 869 050 069 155 840 000 a^{85} x^{85} +

1 068 280 896 893 610 616 751 829 306 627 658 643 253 024 148 775 145 308 160 000 a^{86} x^{86} +

$$12\,208\,924\,535\,926\,978\,477\,163\,763\,504\,316\,098\,780\,034\,561\,700\,287\,374\,950\,400\,a^{87}\,x^{87}\,+$$

$$137\,953\,949\,558\,496\,931\,945\,353\,259\,935\,775\,127\,458\,017\,646\,330\,930\,790\,400\,a^{88}\,x^{88}\,+$$

$$1\,541\,384\,911\,268\,122\,144\,640\,818\,546\,768\,437\,178\,301\,873\,143\,362\,355\,200\,a^{89}\,x^{89}\,+$$

$$17\,031\,877\,472\,575\,935\,299\,898\,547\,478\,104\,278\,213\,280\,366\,224\,998\,400\,a^{90}\,x^{90}\,+$$

$$186\,140\,737\,405\,201\,478\,687\,415\,819\,432\,833\,641\,675\,195\,259\,289\,600\,a^{91}\,x^{91}\,+$$

$$2\,012\,332\,296\,272\,448\,418\,242\,333\,183\,057\,660\,991\,083\,191\,992\,320\,a^{92}\,x^{92}\,+$$

$$21\,522\,270\,548\,368\,432\,280\,666\,665\,059\,440\,224\,503\,563\,550\,720\,a^{93}\,x^{93}\,+$$

$$227\,748\,894\,691\,729\,442\,123\,456\,773\,115\,769\,571\,466\,280\,960\,a^{94}\,x^{94}\,+$$

$$2\,384\,805\,180\,018\,109\,341\,606\,877\,205\,400\,728\,497\,029\,120\,a^{95}\,x^{95}\,+$$

$$24\,713\,007\,046\,819\,785\,923\,387\,328\,553\,375\,424\,839\,680\,a^{96}\,x^{96}\,+$$

$$253\,466\,738\,941\,741\,394\,086\,023\,882\,598\,722\,306\,048\,a^{97}\,x^{97}\,+$$

$$2\,573\,266\,385\,195\,344\,102\,396\,181\,549\,225\,607\,168\,a^{98}\,x^{98}\,+$$

$$25\,861\,973\,720\,556\,222\,134\,634\,990\,444\,478\,464\,a^{99}\,x^{99}\,+$$

$$257\,333\,071\,846\,330\,568\,503\,830\,750\,691\,328\,a^{100}\,x^{100}\,+$$

$$2\,535\,301\,200\,456\,458\,802\,993\,406\,410\,752\,a^{101}\,x^{101}\big)\,+$$

$$272\,005\,392\,664\,986\,731\,633\,210\,805\,919\,809\,598\,966\,129\,140\,566\,884\,083\,609\,827\,035\,708\,497\,865\,916\,$$

$$713\,108\,640\,871\,981\,221\,297\,489\,100\,404\,523\,585\,446\,741\,785\,963\,687\,249\,684\,946\,606\,295\,913\,422\,$$

$$518\,433\,356\,166\,270\,869\,248\,986\,358\,344\,554\,901\,123\,046\,875\,\,e^{a\,x}\,\sqrt{\pi}\,\,\text{Erf}\big[\sqrt{a\,x}\,\big]\big)\,+$$

$$\frac{1}{101}\,x^{101}\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]$$

Problem 69: Result more than twice size of optimal antiderivative.

$$\int x^2\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]\,dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{3}\,x^3\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]\,-\,\frac{\text{Gamma}\big[\frac{9}{2},\,a\,x\big]}{3\,a^3}$$

Result (type 4, 75 leaves):

$$\frac{-2\,e^{-a\,x}\,\sqrt{a\,x}\,\big(105+70\,a\,x+28\,a^2\,x^2+8\,a^3\,x^3\big)+105\,\sqrt{\pi}\,\,\text{Erf}\big[\sqrt{a\,x}\,\big]}{48\,a^3}\,+\,\frac{1}{3}\,x^3\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]$$

Problem 70: Result more than twice size of optimal antiderivative.

$$\int x\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]\,dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{1}{2}\,x^2\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]\,-\,\frac{\text{Gamma}\big[\frac{7}{2},\,a\,x\big]}{2\,a^2}$$

Result (type 4, 68 leaves):

$$\frac{-\frac{1}{8}\,e^{-a\,x}\,\sqrt{a\,x}\,\big(15+10\,a\,x+4\,a^2\,x^2\big)+\frac{15}{16}\,\sqrt{\pi}\,\,\text{Erf}\big[\sqrt{a\,x}\,\big]}{a^2}\,+\,\frac{1}{2}\,x^2\,\text{Gamma}\Big[\frac{3}{2},\,a\,x\Big]$$

Problem 71: Result more than twice size of optimal antiderivative.

$$\int \mathrm{Gamma}\left[\frac{3}{2}, a\, x\right] \mathbb{d}x$$

Optimal (type 4, 22 leaves, 1 step):

$$x\, \mathrm{Gamma}\left[\frac{3}{2}, a\, x\right] - \frac{\mathrm{Gamma}\left[\frac{5}{2}, a\, x\right]}{a}$$

Result (type 4, 54 leaves):

$$\frac{-2\, e^{-a\, x}\, \sqrt{a\, x}\, (3 + 2\, a\, x) + 3\, \sqrt{\pi}\, \mathrm{Erf}\left[\sqrt{a\, x}\right]}{4\, a} + x\, \mathrm{Gamma}\left[\frac{3}{2}, a\, x\right]$$

Problem 83: Unable to integrate problem.

$$\int x^m\, \mathrm{Gamma}[n, b\, x]\, \mathbb{d}x$$

Optimal (type 4, 45 leaves, 1 step):

$$\frac{x^{1+m}\, \mathrm{Gamma}[n, b\, x]}{1+m} - \frac{x^m\, (b\, x)^{-m}\, \mathrm{Gamma}[1 + m + n, b\, x]}{b\, (1+m)}$$

Result (type 8, 11 leaves):

$$\int x^m\, \mathrm{Gamma}[n, b\, x]\, \mathbb{d}x$$

Problem 85: Unable to integrate problem.

$$\int (d\, x)^m\, \mathrm{Gamma}[n, b\, x]\, \mathbb{d}x$$

Optimal (type 4, 52 leaves, 1 step):

$$\frac{(d\, x)^{1+m}\, \mathrm{Gamma}[n, b\, x]}{d\, (1+m)} - \frac{(b\, x)^{-m}\, (d\, x)^m\, \mathrm{Gamma}[1 + m + n, b\, x]}{b\, (1+m)}$$

Result (type 8, 13 leaves):

$$\int (d\, x)^m\, \mathrm{Gamma}[n, b\, x]\, \mathbb{d}x$$

Problem 119: Result more than twice size of optimal antiderivative.

$$\int (c + d\, x)^3\, \mathrm{Gamma}[2, a + b\, x]\, \mathbb{d}x$$

Optimal (type 4, 98 leaves, 5 steps):

$$\frac{(c + d\,x)^4\,\text{Gamma}[2,\,a + b\,x]}{4\,d} + \frac{d^2\,(b\,c - a\,d)\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[5,\,\frac{b\,(c + d\,x)}{d}\right]}{4\,b^4} - \frac{d^3\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[6,\,\frac{b\,(c + d\,x)}{d}\right]}{4\,b^4}$$

Result (type 4, 223 leaves):

$$\frac{1}{4\,b^4}\,e^{-a - b\,x}$$

$$\begin{aligned}
\Big(&-24\,(5 + a)\,d^3 - 4\,b^3\,(c + d\,x)^2\,\big((2 + a)\,c + (5 + a)\,d\,x\big) - 12\,b^2\,d\,(c + d\,x)\,\big((3 + a)\,c + (5 + a)\,d\,x\big) - \\
&24\,b\,d^2\,\big((4 + a)\,c + (5 + a)\,d\,x\big) - b^5\,x^2\,\big(4\,c^3 + 6\,c^2\,d\,x + 4\,c\,d^2\,x^2 + d^3\,x^3\big) - \\
&b^4\,x\,\big(4\,(2 + a)\,c^3 + 6\,(3 + a)\,c^2\,d\,x + 4\,(4 + a)\,c\,d^2\,x^2 + (5 + a)\,d^3\,x^3\big) + \\
&b^4\,e^{a + b\,x}\,x\,\big(4\,c^3 + 6\,c^2\,d\,x + 4\,c\,d^2\,x^2 + d^3\,x^3\big)\,\text{Gamma}[2,\,a + b\,x]\Big)
\end{aligned}$$

Problem 123: Unable to integrate problem.

$$\int \frac{\text{Gamma}[2,\,a + b\,x]}{c + d\,x}\,dx$$

Optimal (type 4, 81 leaves, 6 steps):

$$-\frac{e^{-a - b\,x}}{d} + \frac{e^{-a + \frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c + d\,x)}{d}\right]}{d} - \frac{(b\,c - a\,d)\,e^{-a + \frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c + d\,x)}{d}\right]}{d^2}$$

Result (type 8, 17 leaves):

$$\int \frac{\text{Gamma}[2,\,a + b\,x]}{c + d\,x}\,dx$$

Problem 128: Result more than twice size of optimal antiderivative.

$$\int (c + d\,x)^3\,\text{Gamma}[3,\,a + b\,x]\,dx$$

Optimal (type 4, 140 leaves, 6 steps):

$$\frac{(c + d\,x)^4\,\text{Gamma}[3,\,a + b\,x]}{4\,d} - \frac{d\,(b\,c - a\,d)^2\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[5,\,\frac{b\,(c + d\,x)}{d}\right]}{4\,b^4} +$$

$$\frac{d^2\,(b\,c - a\,d)\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[6,\,\frac{b\,(c + d\,x)}{d}\right]}{2\,b^4} - \frac{d^3\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[7,\,\frac{b\,(c + d\,x)}{d}\right]}{4\,b^4}$$

Result (type 4, 361 leaves):

$$\begin{aligned}
\frac{1}{4\,b^4}\,e^{-a - b\,x}\Big(&-24\,(30 + 10\,a + a^2)\,d^3 - 24\,b\,d^2\,\big((20 + 8\,a + a^2)\,c + (30 + 10\,a + a^2)\,d\,x\big) - \\
&4\,b^3\,(c + d\,x)\,\big((6 + 4\,a + a^2)\,c^2 + 2\,(15 + 7\,a + a^2)\,c\,d\,x + (30 + 10\,a + a^2)\,d^2\,x^2\big) - \\
&12\,b^2\,d\,\big((12 + 6\,a + a^2)\,c^2 + 2\,(20 + 8\,a + a^2)\,c\,d\,x + (30 + 10\,a + a^2)\,d^2\,x^2\big) - \\
&b^6\,x^3\,\big(4\,c^3 + 6\,c^2\,d\,x + 4\,c\,d^2\,x^2 + d^3\,x^3\big) - \\
&2\,b^5\,x^2\,\big((6 + 4\,a)\,c^3 + 6\,(2 + a)\,c^2\,d\,x + 2\,(5 + 2\,a)\,c\,d^2\,x^2 + (3 + a)\,d^3\,x^3\big) - \\
&b^4\,x\,\big(4\,(6 + 4\,a + a^2)\,c^3 + 6\,(12 + 6\,a + a^2)\,c^2\,d\,x + 4\,(20 + 8\,a + a^2)\,c\,d^2\,x^2 + (30 + 10\,a + a^2)\,d^3\,x^3\big) + \\
&b^4\,e^{a + b\,x}\,x\,\big(4\,c^3 + 6\,c^2\,d\,x + 4\,c\,d^2\,x^2 + d^3\,x^3\big)\,\text{Gamma}[3,\,a + b\,x]\Big)
\end{aligned}$$

Problem 131: Result more than twice size of optimal antiderivative.

$$\int \text{Gamma}[3, a + b\, x]\, dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{(a + b\, x)\, \text{Gamma}[3, a + b\, x]}{b} - \frac{\text{Gamma}[4, a + b\, x]}{b}$$

Result (type 4, 81 leaves):

$$e^{-b\, x}\left(-\frac{\left(6 + 4\, a + a^2\right) e^{-a}}{b} - \left(6 + 4\, a + a^2\right) e^{-a}\, x - (3 + 2\, a)\, b\, e^{-a}\, x^2 - b^2\, e^{-a}\, x^3\right) + x\, \text{Gamma}[3, a + b\, x]$$

Problem 132: Unable to integrate problem.

$$\int \frac{\text{Gamma}[3, a + b\, x]}{c + d\, x}\, dx$$

Optimal (type 4, 162 leaves, 13 steps):

$$-\frac{3\, e^{-a-b\, x}}{d} + \frac{(b\, c - a\, d)\, e^{-a-b\, x}}{d^2} - \frac{e^{-a-b\, x}\, (a + b\, x)}{d} + \frac{2\, e^{-a+\frac{b\, c}{d}}\, \text{ExpIntegralEi}\left[-\frac{b\, (c+d\, x)}{d}\right]}{d} -$$
$$\frac{2\, (b\, c - a\, d)\, e^{-a+\frac{b\, c}{d}}\, \text{ExpIntegralEi}\left[-\frac{b\, (c+d\, x)}{d}\right]}{d^2} + \frac{(b\, c - a\, d)^2\, e^{-a+\frac{b\, c}{d}}\, \text{ExpIntegralEi}\left[-\frac{b\, (c+d\, x)}{d}\right]}{d^3}$$

Result (type 8, 17 leaves):

$$\int \frac{\text{Gamma}[3, a + b\, x]}{c + d\, x}\, dx$$

Problem 136: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[3, a + b\, x]}{(c + d\, x)^5}\, dx$$

Optimal (type 4, 142 leaves, 6 steps):

$$\frac{b^4\, (b\, c - a\, d)^2\, e^{-a+\frac{b\, c}{d}}\, \text{Gamma}\left[-3, \frac{b\, (c+d\, x)}{d}\right]}{4\, d^7} -$$
$$\frac{b^4\, (b\, c - a\, d)\, e^{-a+\frac{b\, c}{d}}\, \text{Gamma}\left[-2, \frac{b\, (c+d\, x)}{d}\right]}{2\, d^6} + \frac{b^4\, e^{-a+\frac{b\, c}{d}}\, \text{Gamma}\left[-1, \frac{b\, (c+d\, x)}{d}\right]}{4\, d^5} - \frac{\text{Gamma}[3, a + b\, x]}{4\, d\, (c + d\, x)^4}$$

Result (type 4, 328 leaves):

$$\frac{1}{24\,d^7}\left(\frac{1}{(c+d\,x)^3}b\,d\,e^{-a-b\,x}\left(2\,d^2\,(b\,c-a\,d)^2-b\,d\,(b^2\,c^2-2\,(-3+a)\,b\,c\,d+(-6+a)\,a\,d^2)\,(c+d\,x)+\right.\right.$$

$$b^2\,(b^2\,c^2-2\,(-3+a)\,b\,c\,d+(6-6\,a+a^2)\,d^2)\,(c+d\,x)^2)+$$

$$b^6\,c^2\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]+6\,b^5\,c\,d\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]-$$

$$2\,a\,b^5\,c\,d\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]+$$

$$6\,b^4\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]-6\,a\,b^4\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]+$$

$$\left.\left.a^2\,b^4\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]-\frac{6\,d^6\,\text{Gamma}[3,\,a+b\,x]}{(c+d\,x)^4}\right)\right)$$

Problem 137: Result more than twice size of optimal antiderivative.

$$\int(c+d\,x)^3\,\text{Gamma}[-1,\,a+b\,x]\,dx$$

Optimal (type 4, 139 leaves, 8 steps) :

$$-\frac{3\,d\,(b\,c-a\,d)^2\,e^{-a-b\,x}}{2\,b^4}-\frac{(b\,c-a\,d)^4\,\text{Gamma}[-1,\,a+b\,x]}{4\,b^4\,d}+\frac{(c+d\,x)^4\,\text{Gamma}[-1,\,a+b\,x]}{4\,d}-$$

$$\frac{(b\,c-a\,d)^3\,\text{Gamma}[0,\,a+b\,x]}{b^4}-\frac{d^2\,(b\,c-a\,d)\,\text{Gamma}[2,\,a+b\,x]}{b^4}-\frac{d^3\,\text{Gamma}[3,\,a+b\,x]}{4\,b^4}$$

Result (type 4, 282 leaves) :

$$\frac{1}{4\,b^4}\left(\left(4\,(1+a)\,b^3\,c^3-6\,a\,(2+a)\,b^2\,c^2\,d+4\,a^2\,(3+a)\,b\,c\,d^2-a^3\,(4+a)\,d^3\right)\,\text{ExpIntegralEi}[-a-b\,x]+\right.$$

$$\frac{1}{a+b\,x}e^{-a-b\,x}\left(a^3\,(4\,b\,c-3\,d)\,d^2-a^4\,d^3+a^2\,d\,(-6\,b^2\,c^2+2\,d^2+b\,d\,(8\,c-d\,x))+\right.$$

$$a\,(4\,b^3\,c^3-4\,b\,c\,d^2-2\,d^3+b^2\,d\,(-6\,c^2+4\,c\,d\,x+d^2\,x^2))-$$

$$b\,d\,x\,(2\,d^2+2\,b\,d\,(2\,c+d\,x)+b^2\,(6\,c^2+4\,c\,d\,x+d^2\,x^2))+$$

$$\left.\left.b^4\,e^{a+b\,x}\,x\,(a+b\,x)\,(4\,c^3+6\,c^2\,d\,x+4\,c\,d^2\,x^2+d^3\,x^3)\,\text{Gamma}[-1,\,a+b\,x])\right)\right)$$

Problem 144: Unable to integrate problem.

$$\int\frac{\text{Gamma}[-1,\,a+b\,x]}{(c+d\,x)^4}\,dx$$

Optimal (type 4, 197 leaves, 8 steps) :

$$\frac{b^3\, e^{-a+\frac{b\,c}{d}}\, \text{Gamma}\left[-2,\, \frac{b\,(c+d\,x)}{d}\right]}{3\,d^2\,(b\,c-a\,d)^2} + \frac{b^3\, \text{Gamma}\left[-1,\, a+b\,x\right]}{3\,d\,(b\,c-a\,d)^3} - \frac{\text{Gamma}\left[-1,\, a+b\,x\right]}{3\,d\,(c+d\,x)^3} +$$

$$\frac{2\,b^3\, e^{-a+\frac{b\,c}{d}}\, \text{Gamma}\left[-1,\, \frac{b\,(c+d\,x)}{d}\right]}{3\,d\,(b\,c-a\,d)^3} - \frac{b^3\, \text{Gamma}\left[0,\, a+b\,x\right]}{(b\,c-a\,d)^4} + \frac{b^3\, e^{-a+\frac{b\,c}{d}}\, \text{Gamma}\left[0,\, \frac{b\,(c+d\,x)}{d}\right]}{(b\,c-a\,d)^4}$$

Result (type 8, 17 leaves) :

$$\int \frac{\text{Gamma}\left[-1,\, a+b\,x\right]}{(c+d\,x)^4}\, dx$$

Problem 145: Result more than twice size of optimal antiderivative.

$$\int (c+d\,x)^3\, \text{Gamma}\left[-2,\, a+b\,x\right]\, dx$$

Optimal (type 4, 145 leaves, 8 steps) :

$$-\frac{d^2\,(4\,b\,c-3\,a\,d)\, e^{-a-b\,x}}{4\,b^4} - \frac{(b\,c-a\,d)^4\, \text{Gamma}\left[-2,\, a+b\,x\right]}{4\,b^4\,d} + \frac{(c+d\,x)^4\, \text{Gamma}\left[-2,\, a+b\,x\right]}{4\,d} -$$

$$\frac{(b\,c-a\,d)^3\, \text{Gamma}\left[-1,\, a+b\,x\right]}{b^4} - \frac{3\,d\,(b\,c-a\,d)^2\, \text{Gamma}\left[0,\, a+b\,x\right]}{2\,b^4} - \frac{d^3\, e^{-a}\, \text{Gamma}\left[2,\, b\,x\right]}{4\,b^4}$$

Result (type 4, 398 leaves) :

$$\frac{1}{8}$$

$$\left(\frac{1}{b^4} e^{-a-b\,x}\left(2\,d^2\,(-4\,b\,c+(-1+3\,a)\,d)-2\,b\,d^3\,x - \frac{a\,(-4\,b^3\,c^3+6\,a\,b^2\,c^2\,d-4\,a^2\,b\,c\,d^2+a^3\,d^3)}{(a+b\,x)^2} + \frac{1}{a+b\,x}\right.\right.$$

$$\left.(-4\,(2+a)\,b^3\,c^3+6\,a\,(4+a)\,b^2\,c^2\,d-4\,a^2\,(6+a)\,b\,c\,d^2+a^3\,(8+a)\,d^3)\right) -$$

$$\frac{8\,c^3\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b} - \frac{4\,a\,c^3\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b} +$$

$$\frac{12\,c^2\,d\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2} + \frac{24\,a\,c^2\,d\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2} +$$

$$\frac{6\,a^2\,c^2\,d\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2} - \frac{24\,a\,c\,d^2\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3} -$$

$$\frac{24\,a^2\,c\,d^2\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3} - \frac{4\,a^3\,c\,d^2\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3} +$$

$$\frac{12\,a^2\,d^3\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^4} + \frac{8\,a^3\,d^3\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^4} +$$

$$\frac{a^4\,d^3\, \text{ExpIntegralEi}\left[-a-b\,x\right]}{b^4} + 2\,x\,(4\,c^3+6\,c^2\,d\,x+4\,c\,d^2\,x^2+d^3\,x^3)\, \text{Gamma}\left[-2,\, a+b\,x\right]\right)$$

Problem 146: Result more than twice size of optimal antiderivative.

$$\int (c + d\,x)^2 \, \text{Gamma}[-2, a + b\,x] \, dx$$

Optimal (type 4, 112 leaves, 7 steps):

$$-\frac{d^2 \, e^{-a-b\,x}}{3\,b^3} - \frac{(b\,c - a\,d)^3 \, \text{Gamma}[-2, a + b\,x]}{3\,b^3\,d} + \frac{(c + d\,x)^3 \, \text{Gamma}[-2, a + b\,x]}{3\,d} -$$
$$\frac{(b\,c - a\,d)^2 \, \text{Gamma}[-1, a + b\,x]}{b^3} - \frac{d\,(b\,c - a\,d)\,\text{Gamma}[0, a + b\,x]}{b^3}$$

Result (type 4, 229 leaves):

$$\frac{1}{6\,b^3} \left(- \left(3\,(2 + a)\,b^2\,c^2 - 3\,(2 + 4\,a + a^2)\,b\,c\,d + a\,(6 + 6\,a + a^2)\,d^2\right) \text{ExpIntegralEi}[-a - b\,x] + \right.$$
$$\frac{1}{(a + b\,x)^2} e^{-a-b\,x} \left(-a^4\,d^2 - a^3\,d\,(-3\,b\,c + 5\,d + b\,d\,x) - 2\,b^2\,x\,(3\,b\,c^2 + d^2\,x) - \right.$$
$$a\,b\,(3\,b^2\,c^2\,x + 4\,d^2\,x + 3\,b\,c\,(c - 4\,d\,x)) + a^2\,(-2\,d^2 + 3\,b\,d\,(3\,c - 2\,d\,x) - 3\,b^2\,c\,(c - d\,x)) +$$
$$\left. \left. 2\,b^3\,e^{a+b\,x}\,x\,(a + b\,x)^2\,(3\,c^2 + 3\,c\,d\,x + d^2\,x^2)\,\text{Gamma}[-2, a + b\,x] \right) \right)$$

Problem 148: Result more than twice size of optimal antiderivative.

$$\int \text{Gamma}[-2, a + b\,x] \, dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{(a + b\,x)\,\text{Gamma}[-2, a + b\,x]}{b} - \frac{\text{Gamma}[-1, a + b\,x]}{b}$$

Result (type 4, 77 leaves):

$$\frac{e^{-a-b\,x}\,(a - (2 + a)\,(a + b\,x))}{2\,b\,(a + b\,x)^2} - \frac{\text{ExpIntegralEi}[-a - b\,x]}{b} -$$
$$\frac{a\,\text{ExpIntegralEi}[-a - b\,x]}{2\,b} + x\,\text{Gamma}[-2, a + b\,x]$$

Problem 153: Result more than twice size of optimal antiderivative.

$$\int (c + d\,x)^3 \, \text{Gamma}[-3, a + b\,x] \, dx$$

Optimal (type 4, 139 leaves, 8 steps):

$$-\frac{d^3\, e^{-a-b\,x}}{4\,b^4} - \frac{(b\,c - a\,d)^4\, \mathrm{Gamma}[-3,\, a + b\,x]}{4\,b^4\,d} + \frac{(c + d\,x)^4\, \mathrm{Gamma}[-3,\, a + b\,x]}{4\,d} -$$

$$\frac{(b\,c - a\,d)^3\, \mathrm{Gamma}[-2,\, a + b\,x]}{b^4} - \frac{3\,d\,(b\,c - a\,d)^2\, \mathrm{Gamma}[-1,\, a + b\,x]}{2\,b^4} - \frac{d^2\,(b\,c - a\,d)\, \mathrm{Gamma}[0,\, a + b\,x]}{b^4}$$

Result (type 4, 482 leaves):

$$\frac{1}{24}\left(\frac{1}{b^4}\, e^{-a-b\,x}\left(-6\,d^3 - \frac{2\,a\,\left(-4\,b^3\,c^3 + 6\,a\,b^2\,c^2\,d - 4\,a^2\,b\,c\,d^2 + a^3\,d^3\right)}{(a + b\,x)^3} + \frac{1}{(a + b\,x)^2}\right.\right.$$

$$\left(-4\,(3 + a)\,b^3\,c^3 + 6\,a\,(6 + a)\,b^2\,c^2\,d - 4\,a^2\,(9 + a)\,b\,c\,d^2 + a^3\,(12 + a)\,d^3\right) + \frac{1}{a + b\,x}$$

$$\left.\left(4\,(3 + a)\,b^3\,c^3 - 6\,\left(6 + 6\,a + a^2\right)\,b^2\,c^2\,d + 4\,a\,\left(18 + 9\,a + a^2\right)\,b\,c\,d^2 - a^2\,(6 + a)^2\,d^3\right)\right) +$$

$$\frac{12\,c^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b} + \frac{4\,a\,c^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b} -$$

$$\frac{36\,c^2\,d\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^2} - \frac{36\,a\,c^2\,d\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^2} -$$

$$\frac{6\,a^2\,c^2\,d\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^2} + \frac{24\,c\,d^2\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^3} +$$

$$\frac{72\,a\,c\,d^2\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^3} + \frac{36\,a^2\,c\,d^2\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^3} +$$

$$\frac{4\,a^3\,c\,d^2\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^3} - \frac{24\,a\,d^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^4} -$$

$$\frac{36\,a^2\,d^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^4} - \frac{12\,a^3\,d^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^4} -$$

$$\left.\frac{a^4\,d^3\, \mathrm{ExpIntegralEi}[-a - b\,x]}{b^4} + 6\,x\,\left(4\,c^3 + 6\,c^2\,d\,x + 4\,c\,d^2\,x^2 + d^3\,x^3\right)\, \mathrm{Gamma}[-3,\, a + b\,x]\right)$$

Problem 154: Result more than twice size of optimal antiderivative.

$$\int (c + d\,x)^2\, \mathrm{Gamma}[-3,\, a + b\,x]\ dx$$

Optimal (type 4, 109 leaves, 7 steps):

$$-\frac{(b\,c - a\,d)^3\, \mathrm{Gamma}[-3,\, a + b\,x]}{3\,b^3\,d} + \frac{(c + d\,x)^3\, \mathrm{Gamma}[-3,\, a + b\,x]}{3\,d} -$$

$$\frac{(b\,c - a\,d)^2\, \mathrm{Gamma}[-2,\, a + b\,x]}{b^3} - \frac{d\,(b\,c - a\,d)\, \mathrm{Gamma}[-1,\, a + b\,x]}{b^3} - \frac{d^2\, \mathrm{Gamma}[0,\, a + b\,x]}{3\,b^3}$$

Result (type 4, 351 leaves):

$$\frac{1}{18}\left(\frac{2\,a\,\left(3\,b^2\,c^2-3\,a\,b\,c\,d+a^2\,d^2\right)\,e^{-a-b\,x}}{b^3\,\left(a+b\,x\right)^3}+\frac{\left(-3\,\left(3+a\right)\,b^2\,c^2+3\,a\,\left(6+a\right)\,b\,c\,d-a^2\,\left(9+a\right)\,d^2\right)\,e^{-a-b\,x}}{b^3\,\left(a+b\,x\right)^2}+\right.$$

$$\frac{\left(3\,\left(3+a\right)\,b^2\,c^2-3\,\left(6+6\,a+a^2\right)\,b\,c\,d+a\,\left(18+9\,a+a^2\right)\,d^2\right)\,e^{-a-b\,x}}{b^3\,\left(a+b\,x\right)}+$$

$$\frac{9\,c^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b}+\frac{3\,a\,c^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b}-$$

$$\frac{18\,c\,d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2}-\frac{18\,a\,c\,d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2}-$$

$$\frac{3\,a^2\,c\,d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^2}+\frac{6\,d^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3}+$$

$$\frac{18\,a\,d^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3}+\frac{9\,a^2\,d^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3}+$$

$$\left.\frac{a^3\,d^2\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{b^3}+6\,x\,\left(3\,c^2+3\,c\,d\,x+d^2\,x^2\right)\,\text{Gamma}\left[-3,\,a+b\,x\right]\right)$$

Problem 155: Result more than twice size of optimal antiderivative.

$$\int\left(c+d\,x\right)\,\text{Gamma}\left[-3,\,a+b\,x\right]\,dx$$

Optimal (type 4, 84 leaves, 6 steps):

$$-\frac{\left(b\,c-a\,d\right)^2\,\text{Gamma}\left[-3,\,a+b\,x\right]}{2\,b^2\,d}+\frac{\left(c+d\,x\right)^2\,\text{Gamma}\left[-3,\,a+b\,x\right]}{2\,d}-$$

$$\frac{\left(b\,c-a\,d\right)\,\text{Gamma}\left[-2,\,a+b\,x\right]}{b^2}-\frac{d\,\text{Gamma}\left[-1,\,a+b\,x\right]}{2\,b^2}$$

Result (type 4, 270 leaves):

$$d\,e^{-b\,x}\left(-\frac{a^2\,e^{-a}}{6\,b^2\,\left(a+b\,x\right)^3}+\frac{a\,\left(6+a\right)\,e^{-a}}{12\,b^2\,\left(a+b\,x\right)^2}-\frac{\left(6+6\,a+a^2\right)\,e^{-a}}{12\,b^2\,\left(a+b\,x\right)}\right)+$$

$$c\,e^{-b\,x}\left(\frac{a\,e^{-a}}{3\,b\,\left(a+b\,x\right)^3}-\frac{\left(3+a\right)\,e^{-a}}{6\,b\,\left(a+b\,x\right)^2}+\frac{\left(3+a\right)\,e^{-a}}{6\,b\,\left(a+b\,x\right)}\right)+\frac{c\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{2\,b}+$$

$$\frac{a\,c\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{6\,b}-\frac{d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{2\,b^2}-\frac{a\,d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{2\,b^2}-$$

$$\frac{a^2\,d\,\text{ExpIntegralEi}\left[-a-b\,x\right]}{12\,b^2}+c\,x\,\text{Gamma}\left[-3,\,a+b\,x\right]+\frac{1}{2}\,d\,x^2\,\text{Gamma}\left[-3,\,a+b\,x\right]$$

Problem 156: Result more than twice size of optimal antiderivative.

$$\int\text{Gamma}\left[-3,\,a+b\,x\right]\,dx$$

Optimal (type 4, 29 leaves, 1 step):

$$\frac{(a + b\,x)\,\text{Gamma}[-3,\,a + b\,x]}{b} - \frac{\text{Gamma}[-2,\,a + b\,x]}{b}$$

Result (type 4, 89 leaves):

$$\frac{1}{6}\left(\frac{e^{-a-b\,x}\left(2\,a - (3 + a)\,(a + b\,x) + (3 + a)\,(a + b\,x)^2\right)}{b\,(a + b\,x)^3} + \right.$$
$$\left.\frac{3\,\text{ExpIntegralEi}[-a - b\,x]}{b} + \frac{a\,\text{ExpIntegralEi}[-a - b\,x]}{b} + 6\,x\,\text{Gamma}[-3,\,a + b\,x]\right)$$

Problem 158: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-3,\,a + b\,x]}{(c + d\,x)^2}\,dx$$

Optimal (type 4, 144 leaves, 8 steps):

$$\frac{b\,\text{Gamma}[-3,\,a + b\,x]}{d\,(b\,c - a\,d)} - \frac{\text{Gamma}[-3,\,a + b\,x]}{d\,(c + d\,x)} - \frac{b\,\text{Gamma}[-2,\,a + b\,x]}{(b\,c - a\,d)^2} +$$
$$\frac{b\,d\,\text{Gamma}[-1,\,a + b\,x]}{(b\,c - a\,d)^3} - \frac{b\,d^2\,\text{Gamma}[0,\,a + b\,x]}{(b\,c - a\,d)^4} + \frac{b\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{Gamma}\left[0,\,\frac{b\,(c + d\,x)}{d}\right]}{(b\,c - a\,d)^4}$$

Result (type 4, 395 leaves):

$$\frac{b\,d^2\,\text{ExpIntegralEi}[-a - b\,x]}{(-b\,c + a\,d)^4} + \frac{1}{6\,d\,(b\,c - a\,d)^3\,(a + b\,x)^3}$$
$$b\left(\left(3\,a^2\,d^2 + 3\,a\,b\,d\,(-c + d\,x) + b^2\,(c^2 - c\,d\,x + d^2\,x^2)\right)\left(e^{-a-b\,x}\left(2 - a - b\,x + (a + b\,x)^2\right) + \right.\right.$$
$$\left.(a + b\,x)^3\,\text{ExpIntegralEi}[-a - b\,x]\right) - d\,e^{-a-b\,x}\,(a + b\,x)\,(-3\,a\,d + b\,(c - 2\,d\,x))$$
$$\left(1 - a^2 - 2\,b\,x - b^2\,x^2 - 2\,a\,(1 + b\,x) - e^{a+b\,x}\,(a + b\,x)^2\,(3 + a + b\,x)\,\text{ExpIntegralEi}[-a - b\,x]\right) +$$
$$d^2\,e^{-a-b\,x}\,(a + b\,x)^2\,\left(2 + a^2 + 5\,b\,x + b^2\,x^2 + a\,(5 + 2\,b\,x) + e^{a+b\,x}\,(a^3 + 3\,a^2\,(2 + b\,x) + \right.$$
$$\left.\left.3\,a\,(2 + 4\,b\,x + b^2\,x^2) + b\,x\,(6 + 6\,b\,x + b^2\,x^2)\right)\,\text{ExpIntegralEi}[-a - b\,x]\right)\right) -$$
$$\frac{b\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,c}{d} - b\,x\right]}{(-b\,c + a\,d)^4} - \frac{\text{Gamma}[-3,\,a + b\,x]}{d\,(c + d\,x)}$$

Problem 159: Result more than twice size of optimal antiderivative.

$$\int \frac{\text{Gamma}[-3,\,a + b\,x]}{(c + d\,x)^3}\,dx$$

Optimal (type 4, 205 leaves, 9 steps):

$$\frac{b^2 \, \text{Gamma}[-3, a+b\,x]}{2\,d\,(b\,c-a\,d)^2} - \frac{\text{Gamma}[-3, a+b\,x]}{2\,d\,(c+d\,x)^2} - \frac{b^2 \, \text{Gamma}[-2, a+b\,x]}{(b\,c-a\,d)^3} + \frac{3\,b^2\,d\,\text{Gamma}[-1, a+b\,x]}{2\,(b\,c-a\,d)^4} +$$

$$\frac{b^2\,d\,e^{-a+\frac{b\,c}{d}}\,\text{Gamma}\left[-1, \frac{b\,(c+d\,x)}{d}\right]}{2\,(b\,c-a\,d)^4} - \frac{2\,b^2\,d^2\,\text{Gamma}[0, a+b\,x]}{(b\,c-a\,d)^5} + \frac{2\,b^2\,d^2\,e^{-a+\frac{b\,c}{d}}\,\text{Gamma}\left[0, \frac{b\,(c+d\,x)}{d}\right]}{(b\,c-a\,d)^5}$$

Result (type 4, 877 leaves) :

$$\frac{1}{12}\left(\frac{1}{(c+d\,x)^3} 2\left(\frac{e^{-a-b\,x}\left(2\,a - (3+a)\,(a+b\,x) + (3+a)\,(a+b\,x)^2\right)}{b\,(a+b\,x)^3} + \right.\right.$$

$$\left.\frac{3\,\text{ExpIntegralEi}[-a-b\,x]}{b} + \frac{a\,\text{ExpIntegralEi}[-a-b\,x]}{b} + 6\,x\,\text{Gamma}[-3, a+b\,x]\right) +$$

$$d\left(e^{-a-b\,x}\left(-\frac{2\,b^2\,(b\,c-3\,a\,d)}{d^2\,(-b\,c+a\,d)^3\,(a+b\,x)^3} - \frac{b^2\left(b^2\,c^2 - 4\,a\,b\,c\,d + 3\,(-4+a)\,a\,d^2\right)}{d^2\,(b\,c-a\,d)^4\,(a+b\,x)^2} - \right.\right.$$

$$\left(b^2\left(b^3\,c^3 - 5\,a\,b^2\,c^2\,d + a\,(-6+7\,a)\,b\,c\,d^2 - 3\,a\,(8 - 2\,a + a^2)\,d^3\right)\right) \Big/$$

$$\left(d^2\,(-b\,c+a\,d)^5\,(a+b\,x)\right) + \frac{2\left((3+a)\,b^2\,c^2 + (3 - 5\,a - 2\,a^2)\,b\,c\,d + a\,(-1 + 2\,a + a^2)\,d^2\right)}{b\,(b\,c-a\,d)^3\,(c+d\,x)^3} +$$

$$\frac{2\left((3+a)\,b^2\,c^2 - 2\,(-3 + 2\,a + a^2)\,b\,c\,d + a^2\,(1+a)\,d^2\right)}{(b\,c-a\,d)^4\,(c+d\,x)^2} +$$

$$\left.\frac{2\,b\left((3+a)\,b^2\,c^2 + (12 - 3\,a - 2\,a^2)\,b\,c\,d + a^3\,d^2\right)}{(b\,c-a\,d)^5\,(c+d\,x)}\right) + \frac{18\,b^3\,c\,\text{ExpIntegralEi}[-a-b\,x]}{(b\,c-a\,d)^5} -$$

$$\frac{12\,a\,b^3\,c\,\text{ExpIntegralEi}[-a-b\,x]}{(b\,c-a\,d)^5} + \frac{3\,a^2\,b^3\,c\,\text{ExpIntegralEi}[-a-b\,x]}{(b\,c-a\,d)^5} +$$

$$\frac{b^5\,c^3\,\text{ExpIntegralEi}[-a-b\,x]}{d^2\,(b\,c-a\,d)^5} + \frac{6\,b^4\,c^2\,\text{ExpIntegralEi}[-a-b\,x]}{d\,(b\,c-a\,d)^5} +$$

$$\frac{24\,b^2\,d\,\text{ExpIntegralEi}[-a-b\,x]}{(b\,c-a\,d)^5} + \frac{3\,a\,b^4\,c^2\,\text{ExpIntegralEi}[-a-b\,x]}{d\,(-b\,c+a\,d)^5} +$$

$$\frac{18\,a\,b^2\,d\,\text{ExpIntegralEi}[-a-b\,x]}{(-b\,c+a\,d)^5} - \frac{6\,a^2\,b^2\,d\,\text{ExpIntegralEi}[-a-b\,x]}{(-b\,c+a\,d)^5} +$$

$$\frac{a^3\,b^2\,d\,\text{ExpIntegralEi}[-a-b\,x]}{(-b\,c+a\,d)^5} - \frac{2\,(3+a)\,\text{ExpIntegralEi}[-a-b\,x]}{b\,d\,(c+d\,x)^3} +$$

$$\frac{6\,b^3\,c\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]}{(b\,c-a\,d)^5} - \frac{24\,b^2\,d\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]}{(b\,c-a\,d)^5} +$$

$$\left.\left.\frac{6\,a\,b^2\,d\,e^{-a+\frac{b\,c}{d}}\,\text{ExpIntegralEi}\left[-\frac{b\,(c+d\,x)}{d}\right]}{(-b\,c+a\,d)^5} - \frac{6\,(c+3\,d\,x)\,\text{Gamma}[-3, a+b\,x]}{d^2\,(c+d\,x)^3}\right)\right)\right)$$

Problem 160: Unable to integrate problem.

$$\int \frac{\text{Gamma}[-3, a + b\,x]}{(c + d\,x)^4}\,dx$$

Optimal (type 4, 248 leaves, 10 steps):

$$\frac{b^3\,\text{Gamma}[-3, a + b\,x]}{3\,d\,(b\,c - a\,d)^3} - \frac{\text{Gamma}[-3, a + b\,x]}{3\,d\,(c + d\,x)^3} - \frac{b^3\,\text{Gamma}[-2, a + b\,x]}{(b\,c - a\,d)^4} +$$

$$\frac{b^3\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[-2, \frac{b\,(c + d\,x)}{d}\right]}{3\,(b\,c - a\,d)^4} + \frac{2\,b^3\,d\,\text{Gamma}[-1, a + b\,x]}{(b\,c - a\,d)^5} + \frac{4\,b^3\,d\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[-1, \frac{b\,(c + d\,x)}{d}\right]}{3\,(b\,c - a\,d)^5} -$$

$$\frac{10\,b^3\,d^2\,\text{Gamma}[0, a + b\,x]}{3\,(b\,c - a\,d)^6} + \frac{10\,b^3\,d^2\,e^{-a + \frac{b\,c}{d}}\,\text{Gamma}\left[0, \frac{b\,(c + d\,x)}{d}\right]}{3\,(b\,c - a\,d)^6}$$

Result (type 8, 17 leaves):

$$\int \frac{\text{Gamma}[-3, a + b\,x]}{(c + d\,x)^4}\,dx$$

Problem 230: Unable to integrate problem.

$$\int \left(\frac{\text{PolyGamma}[1, a + b\,x]}{x^2} - \frac{b\,\text{PolyGamma}[2, a + b\,x]}{x}\right)\,dx$$

Optimal (type 4, 12 leaves, 2 steps):

$$-\frac{\text{PolyGamma}[1, a + b\,x]}{x}$$

Result (type 8, 27 leaves):

$$\int \left(\frac{\text{PolyGamma}[1, a + b\,x]}{x^2} - \frac{b\,\text{PolyGamma}[2, a + b\,x]}{x}\right)\,dx$$

Problem 231: Unable to integrate problem.

$$\int \left(\frac{\text{PolyGamma}[n, a + b\,x]}{x^2} - \frac{b\,\text{PolyGamma}[1 + n, a + b\,x]}{x}\right)\,dx$$
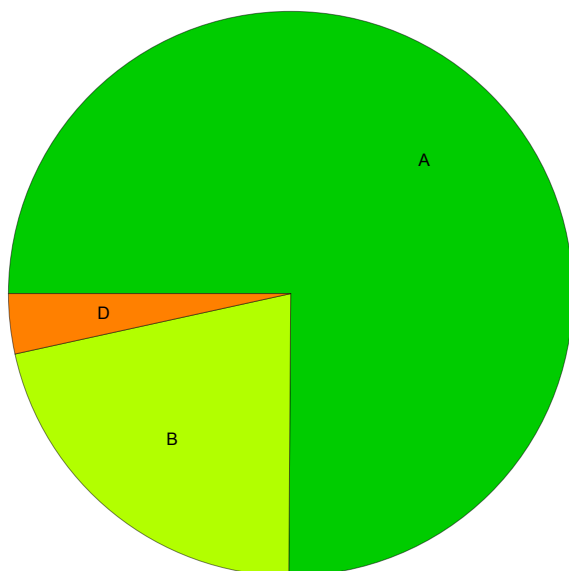
Optimal (type 4, 12 leaves, 2 steps):

$$-\frac{\text{PolyGamma}[n, a + b\,x]}{x}$$

Result (type 8, 29 leaves):

$$\int \left(\frac{\text{PolyGamma}[n, a + b\,x]}{x^2} - \frac{b\,\text{PolyGamma}[1 + n, a + b\,x]}{x}\right)\,dx$$

Summary of Integration Test Results

233 integration problems

A - 175 optimal antiderivatives

B - 50 more than twice size of optimal antiderivatives

C - 0 unnecessarily complex antiderivatives

D - 8 unable to integrate problems

E - 0 integration timeouts