

自由討論

新しい Mersenne 素数

京大教理研 一松 信

1979年春の学会で、25番目の Mersenne 素数 $M(21701)$

$(M(p) = 2^p - 1)$ を報告したあと、さらに2つが発見された。

| 番 | p | 発見日 | 計算機 | 所要時間 | 発見者 |
|----|----------------|-----------------------|-----------|--------------------------------|-----------------------|
| 25 | 21701 | 1978/10/30 | Cyber-174 | 7 ^h 42 ^m | Miss Nickel, C.L.Noll |
| 26 | 23209 | 1979/2/9 | " " | 8 ^h 40 ^m | C.L.Noll |
| 26 | 23209 (再発見) | 1979/2/23 (タッチの差!) | CRAY-1 | 7 ^m | Slowinski |
| 27 | 44497 | 1979/4/8 | " " | 約 45 ^m ? | " " |

既に50000まで検証済み; $65537 = 2^{16} + 1$ が注目される
が、28番目は7~8万? ; 一方 $M(8191)$ が素数でないことの

| 年 | 計算者 | 計算機 | 所要時間 | ← (検証)に要した時間は左の通り; 実に3万倍のスピードアップ! |
|------|-----------|------------|-------------------|-----------------------------------|
| 1959 | Wheeler | Illiac-I | 100 ^h | |
| 1961 | Hurwitz | IBM 7090 | 5.2 ^h | |
| 1962 | Gillies | Illiac-II | 49 ^m | |
| 1971 | Tuckerman | IBM 360/91 | 3.17 ^m | |
| 1979 | Slowinski | CRAY-1 | 10 ^{sec} | |

[参] David Slowinski, Searching for the 27th Mersenne

prime, J. Recreational Math., 11 (1979), p.258-261.

なお参考までに $M(44497)$ の十進数値 (13395桁) を示す。

M(44497)

| | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 85450 | 98243 | 03633 | 80319 | 33007 | 05318 | 40303 | 65099 | 01591 | 30402 |
| 10583 | 43269 | 25828 | 22900 | 64782 | 16763 | 58562 | 00500 | 01445 | 76458 |
| 61481 | 31529 | 52532 | 23674 | 93834 | 05022 | 25641 | 43679 | 42948 | 36286 |
| 61393 | 36719 | 22838 | 72234 | 92861 | 85054 | 45379 | 94849 | 19702 | 81406 |
| 62986 | 82412 | 85302 | 25945 | 82702 | 53225 | 36370 | 46393 | 57381 | 91023 |
| 39382 | 60354 | 67050 | 57592 | 74342 | 53739 | 88510 | 06759 | 42584 | 89091 |
| 88265 | 28169 | 84230 | 48133 | 92310 | 89370 | 59752 | 24296 | 57962 | 22102 |
| 36253 | 89786 | 83847 | 62225 | 62700 | 93757 | 28494 | 93656 | 77830 | 97098 |
| 48902 | 61155 | 98174 | 81821 | 64856 | 29914 | 14301 | 18685 | 26311 | 09919 |
| 62801 | 45068 | 91879 | 93826 | 99198 | 76375 | 04147 | 60545 | 70480 | 39381 |
| 78020 | 67642 | 57380 | 29343 | 20804 | 00468 | 92120 | 61263 | 13493 | 71911 |
| 46939 | 21796 | 78639 | 13998 | 34045 | 03020 | 66353 | 31606 | 04468 | 99821 |
| 96001 | 69651 | 49455 | 24745 | 12568 | 66120 | 41645 | 58377 | 85237 | 88944 |
| 27367 | 16622 | 86369 | 47990 | 63147 | 97242 | 19151 | 37281 | 18522 | 36394 |
| 85530 | 93908 | 07007 | 03965 | 63052 | 42848 | 03696 | 32952 | 25945 | 60178 |
| 56523 | 10064 | 28355 | 91426 | 44558 | 09535 | 90482 | 71845 | 67881 | 97075 |
| 28150 | 68646 | 41253 | 52129 | 46406 | 29344 | 64045 | 77519 | 74790 | 06845 |
| 36609 | 90207 | 25849 | 92617 | 98131 | 10483 | 65318 | 24933 | 20032 | 77695 |
| 72733 | 42392 | 48756 | 02291 | 93230 | 29881 | 11704 | 27442 | 12106 | 82244 |
| 81670 | 90688 | 81626 | 80584 | 19617 | 82305 | 03628 | 06871 | 64419 | 50949 |
| 89164 | 02784 | 27312 | 00313 | 53652 | 87528 | 98778 | 62567 | 44735 | 49278 |
| 40677 | 31851 | 97120 | 72487 | 34409 | 81199 | 28604 | 49987 | 61054 | 19523 |
| 13739 | 56949 | 18998 | 91918 | 76556 | 22934 | 47301 | 15045 | 09146 | 22261 |
| 03168 | 61883 | 40973 | 44609 | 99715 | 66101 | 33228 | 83140 | 59541 | 18698 |
| 39736 | 08678 | 36938 | 45126 | 70266 | 26659 | 09184 | 39881 | 80773 | 27943 |
| 60864 | 90179 | 65028 | 43005 | 57692 | 23418 | 34764 | 42984 | 64630 | 91830 |
| 72757 | 23297 | 41002 | 22299 | 11638 | 94919 | 38691 | 66402 | 68216 | 10953 |
| 87003 | 21337 | 49491 | 82998 | 36344 | 56251 | 00201 | 87679 | 11077 | 34199 |
| 89824 | 06542 | 11719 | 24429 | 61159 | 63918 | 78375 | 94167 | 90689 | 68133 |
| 06451 | 43318 | 89509 | 86000 | 60225 | 59477 | 01445 | 47105 | 14711 | 24124 |
| 84843 | 36829 | 21474 | 57497 | 20575 | 06821 | 41506 | 84678 | 50112 | 48188 |
| 09203 | 31630 | 72001 | 36273 | 42971 | 79622 | 00981 | 46625 | 25312 | 59013 |
| 37980 | 38623 | 48176 | 29898 | 71070 | 81761 | 58298 | 69313 | 31492 | 14166 |
| 39943 | 16562 | 77231 | 16460 | 02375 | 27367 | 26677 | 66798 | 70865 | 78579 |
| 78302 | 36117 | 27781 | 83510 | 59865 | 80158 | 83767 | 86510 | 90390 | 04346 |
| 42861 | 82430 | 73686 | 60843 | 52550 | 91461 | 80113 | 48921 | 59702 | 53073 |
| 13453 | 69323 | 34593 | 26334 | 34286 | 57338 | 62737 | 84921 | 78677 | 79778 |
| 49042 | 72941 | 83181 | 34604 | 34829 | 23812 | 28571 | 12185 | 86616 | 12351 |
| 73379 | 89610 | 27307 | 67761 | 42355 | 83931 | 78166 | 22471 | 56209 | 52758 |
| 65359 | 12325 | 86065 | 13093 | 16122 | 35961 | 02449 | 59550 | 52576 | 31378 |
| 54155 | 87572 | 21800 | 30044 | 63096 | 12301 | 06754 | 60429 | 58623 | 35827 |
| 74784 | 37574 | 66140 | 62343 | 08742 | 88873 | 76655 | 42006 | 32378 | 88060 |
| 86319 | 89480 | 04060 | 43577 | 07271 | 03254 | 01655 | 16719 | 80979 | 67092 |
| 44397 | 68697 | 02778 | 91575 | 97450 | 82062 | 54271 | 40967 | 08487 | 62533 |
| 30432 | 90708 | 23626 | 16208 | 05834 | 31773 | 45138 | 01881 | 28330 | 29933 |
| 66020 | 04181 | 78113 | 06799 | 87194 | 26282 | 67417 | 60295 | 37056 | 94667 |
| 60107 | 43381 | 94986 | 32483 | 22018 | 12034 | 79512 | 03883 | 97181 | 31167 |
| 98180 | 48004 | 11452 | 50934 | 31994 | 01952 | 12376 | 99707 | 00204 | 03473 |
| 24061 | 84275 | 12395 | 56599 | 40176 | 39267 | 64238 | 75903 | 52270 | 62340 |
| 38414 | 09398 | 77819 | 79650 | 52818 | 88049 | 41226 | 79879 | 63745 | 09829 |
| 29872 | 55988 | 06238 | 84514 | 66219 | 66945 | 67744 | 02794 | 01300 | 38179 |
| 92018 | 25952 | 48220 | 02996 | 05458 | 36068 | 43783 | 65372 | 20421 | 15186 |
| 54952 | 76144 | 87416 | 35109 | 98224 | 61908 | 60274 | 69138 | 96054 | 35633 |
| 66461 | 31028 | 03628 | 35876 | 32482 | 77099 | 09151 | 75883 | 67386 | 59026 |
| 34698 | 33549 | 07158 | 53374 | 11720 | 08557 | 34728 | 91918 | 34118 | 87434 |
| 45072 | 11706 | 39972 | 84882 | 80164 | 71994 | 19185 | 48596 | 99641 | 00640 |
| 74112 | 83551 | 67464 | 54014 | 44064 | 01476 | 99966 | 79200 | 16366 | 49078 |
| 49204 | 94972 | 99992 | 03701 | 07225 | 02767 | 12361 | 46745 | 70208 | 32508 |
| 57862 | 03978 | 91324 | 60130 | 88500 | 64005 | 27804 | 03783 | 19736 | 37964 |
| 95378 | 94101 | 43223 | 53383 | 86775 | 71168 | 08444 | 85923 | 60338 | 84177 |
| 50348 | 86947 | 46360 | 26308 | 10775 | 18495 | 27867 | 26730 | 07687 | 71463 |
| 38146 | 75074 | 08140 | 39277 | 08449 | 05258 | 23622 | 41943 | 69720 | 62872 |
| 36587 | 20856 | 22936 | 41356 | 09456 | 61852 | 55157 | 88779 | 45175 | 32173 |

| | | | | | | | | | | |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2 | 28311 | 18330 | 00302 | 02561 | 30052 | 13405 | 48225 | 28781 | 49070 | 26520 |
| | 54403 | 73545 | 42691 | 01616 | 11341 | 18555 | 90509 | 88906 | 02013 | 76141 |
| | 09481 | 96584 | 77367 | 96392 | 11252 | 13754 | 19675 | 32300 | 07792 | 70489 |
| | 34092 | 38065 | 43050 | 95682 | 75590 | 32136 | 72882 | 84256 | 49916 | 32316 |
| | 00415 | 09893 | 23995 | 39296 | 50589 | 54486 | 46461 | 69009 | 56812 | 59701 |
| | 29331 | 38966 | 84099 | 73033 | 90729 | 74459 | 99076 | 18665 | 10957 | 65310 |
| | 31106 | 10436 | 82896 | 56901 | 62096 | 94536 | 99613 | 62664 | 70191 | 56940 |
| | 80333 | 23541 | 69405 | 73867 | 38735 | 23146 | 53914 | 17715 | 85753 | 14885 |
| | 77897 | 25085 | 17929 | 09910 | 16947 | 07248 | 53261 | 42784 | 99405 | 49334 |
| | 30589 | 64755 | 92823 | 99265 | 64583 | 47993 | 88421 | 45750 | 74296 | 81467 |
| | 68744 | 64971 | 19721 | 56499 | 74506 | 72405 | 89160 | 41508 | 91604 | 91697 |
| | 07455 | 16543 | 86836 | 27351 | 82402 | 12321 | 73847 | 65017 | 50095 | 69246 |
| | 84458 | 53397 | 64331 | 44403 | 98797 | 15595 | 93528 | 05156 | 40897 | 48125 |
| | 70478 | 84715 | 26363 | 56218 | 31312 | 25073 | 30952 | 44741 | 47337 | 94129 |
| | 94928 | 93724 | 65044 | 71873 | 36009 | 34229 | 45901 | 66968 | 86367 | 33052 |
| | 87221 | 51883 | 92668 | 34387 | 05183 | 32217 | 35798 | 06860 | 70609 | 32055 |
| | 44809 | 10523 | 79555 | 39422 | 58900 | 94860 | 06438 | 31553 | 78512 | 73821 |
| | 96992 | 54333 | 81441 | 41784 | 19800 | 24549 | 00271 | 44309 | 16827 | 56574 |
| | 61668 | 57532 | 40566 | 08338 | 45059 | 11986 | 64472 | 08387 | 38796 | 54075 |
| | 44978 | 74824 | 08931 | 43544 | 27768 | 56039 | 01258 | 21906 | 97433 | 13779 |
| | 15589 | 87483 | 30968 | 32220 | 36482 | 62146 | 37532 | 46744 | 32572 | 19325 |
| | 37354 | 25956 | 32168 | 86819 | 68456 | 62314 | 53525 | 77457 | 40540 | 69008 |
| | 87212 | 58932 | 37572 | 69267 | 80766 | 04296 | 05225 | 70262 | 39194 | 47422 |
| | 91827 | 50052 | 47196 | 18152 | 20470 | 66412 | 89353 | 52703 | 92504 | 45951 |
| | 67438 | 71409 | 64202 | 97977 | 15256 | 91667 | 92363 | 55153 | 33128 | 24086 |
| | 81220 | 85666 | 45140 | 56058 | 34956 | 47240 | 65822 | 98196 | 81596 | 19963 |
| | 23161 | 56585 | 05169 | 41679 | 84580 | 98037 | 06388 | 74320 | 60050 | 82498 |
| | 28790 | 88284 | 47142 | 46861 | 26989 | 42513 | 77541 | 71119 | 48840 | 51751 |
| | 07174 | 44158 | 41531 | 14258 | 72235 | 50491 | 22929 | 00931 | 53029 | 45400 |
| | 12529 | 26062 | 52239 | 47584 | 18678 | 70910 | 65270 | 99702 | 61193 | 86422 |
| | 40709 | 90576 | 87522 | 69224 | 34455 | 28559 | 80436 | 51495 | 19299 | 36636 |
| | 06365 | 24787 | 81205 | 55979 | 48447 | 73873 | 31573 | 86435 | 93301 | 91816 |
| | 91527 | 12330 | 01424 | 39165 | 13263 | 92206 | 58338 | 16688 | 26007 | 17005 |
| | 94605 | 70681 | 09508 | 19028 | 91690 | 77800 | 58985 | 50309 | 39849 | 41430 |
| | 56099 | 38324 | 42106 | 56853 | 42787 | 33512 | 26289 | 43893 | 22473 | 75588 |
| | 00955 | 29123 | 01623 | 54473 | 70366 | 82694 | 18246 | 87645 | 00514 | 59098 |
| | 72994 | 96864 | 27616 | 99131 | 03462 | 58467 | 80771 | 42004 | 93294 | 63495 |
| | 42672 | 80195 | 05546 | 09826 | 24792 | 49314 | 72490 | 23081 | 29116 | 06993 |
| | 72476 | 86008 | 46468 | 90874 | 32538 | 29902 | 75414 | 74948 | 29768 | 30377 |
| | 41993 | 72534 | 67357 | 63886 | 59135 | 08180 | 28660 | 54097 | 68240 | 64090 |
| | 48786 | 08687 | 28469 | 05780 | 97084 | 18994 | 39669 | 91203 | 57632 | 71629 |
| | 81834 | 47375 | 69466 | 79902 | 79960 | 15564 | 03227 | 03599 | 77334 | 08463 |
| | 05188 | 28780 | 40648 | 60590 | 34899 | 43500 | 99009 | 04288 | 17282 | 13656 |
| | 22445 | 43138 | 22775 | 19348 | 70681 | 97752 | 94700 | 93118 | 30737 | 77978 |
| | 64388 | 13486 | 63373 | 75506 | 71746 | 68658 | 40299 | 56139 | 16875 | 95163 |
| | 81487 | 10732 | 57516 | 23713 | 89530 | 84739 | 74132 | 10465 | 12519 | 89878 |
| | 30559 | 85137 | 56290 | 99868 | 62822 | 82141 | 86979 | 09218 | 61837 | 58247 |
| | 76243 | 59612 | 96355 | 76799 | 35999 | 93693 | 44085 | 92348 | 07176 | 98699 |
| | 57349 | 19472 | 66917 | 23831 | 61365 | 94697 | 51574 | 88841 | 32844 | 39681 |
| | 46718 | 47273 | 71974 | 48793 | 57852 | 87954 | 77262 | 24395 | 77801 | 87918 |
| | 17246 | 41229 | 53268 | 38150 | 97993 | 92969 | 19653 | 49653 | 92702 | 25341 |
| | 82603 | 77147 | 55592 | 30150 | 02062 | 79366 | 16032 | 11014 | 33476 | 53816 |
| | 82118 | 77778 | 28923 | 63824 | 92839 | 50781 | 63090 | 54101 | 99680 | 78819 |
| | 65990 | 25114 | 40605 | 31583 | 26966 | 73325 | 03639 | 84727 | 12893 | 31205 |
| | 43136 | 60640 | 69530 | 88382 | 08998 | 68706 | 70943 | 68364 | 81848 | 78969 |
| | 07646 | 73023 | 86269 | 57405 | 97045 | 35860 | 69579 | 28324 | 45681 | 57661 |
| | 30005 | 84638 | 54019 | 00094 | 39535 | 36847 | 80895 | 77633 | 62537 | 96523 |
| | 78207 | 56796 | 13024 | 96833 | 92901 | 75813 | 86538 | 77932 | 55361 | 74284 |
| | 77840 | 29992 | 11058 | 89493 | 40556 | 74164 | 36638 | 46869 | 77501 | 84781 |
| | 18394 | 44336 | 52507 | 93299 | 81750 | 62446 | 03536 | 40851 | 58105 | 04456 |
| | 08565 | 66811 | 83484 | 76690 | 96325 | 04119 | 15910 | 18577 | 86213 | 08437 |
| | 03757 | 78253 | 37199 | 39505 | 68270 | 60836 | 87202 | 55920 | 09610 | 74842 |
| | 59695 | 78500 | 27992 | 44185 | 25187 | 00947 | 75729 | 33399 | 59334 | 99076 |
| | 25737 | 96010 | 75025 | 93975 | 93822 | 82614 | 48471 | 02862 | 55549 | 93274 |
| | 53759 | 52696 | 10929 | 30411 | 18929 | 79412 | 37551 | 68354 | 27571 | 93673 |
| | 65141 | 15422 | 36825 | 77274 | 75698 | 69398 | 01666 | 35387 | 89827 | 12419 |

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|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 67204 | 78958 | 27951 | 42156 | 36013 | 04219 | 35293 | 92016 | 17281 | 94513 |
| 07114 | 44593 | 49891 | 05000 | 78357 | 20277 | 55786 | 98708 | 41775 | 86504 |
| 76732 | 44432 | 16153 | 89586 | 33718 | 31780 | 52363 | 10457 | 70366 | 67976 |
| 98179 | 43797 | 75137 | 25497 | 46991 | 25521 | 66380 | 59996 | 52545 | 54193 |
| 60357 | 23389 | 82605 | 68126 | 17646 | 77975 | 42779 | 45047 | 64411 | 66098 |
| 28329 | 73679 | 04363 | 93517 | 41328 | 82515 | 58898 | 04551 | 47494 | 45906 |
| 42319 | 43237 | 06306 | 41411 | 93666 | 29747 | 90748 | 12873 | 73940 | 83284 |
| 29139 | 69451 | 23318 | 69148 | 69606 | 74329 | 19164 | 09591 | 01959 | 26320 |
| 25299 | 62819 | 76113 | 84253 | 26492 | 47485 | 40717 | 95500 | 61480 | 11213 |
| 19633 | 09733 | 38173 | 35835 | 07313 | 30358 | 80117 | 66870 | 55820 | 66700 |
| 73162 | 06485 | 17429 | 49807 | 19681 | 58061 | 10075 | 76366 | 31556 | 68179 |
| 88676 | 67662 | 98180 | 69714 | 32222 | 68517 | 13501 | 05667 | 67036 | 93691 |
| 88242 | 46899 | 48234 | 28299 | 09756 | 89672 | 22651 | 83434 | 70550 | 97417 |
| 41959 | 76295 | 77651 | 33794 | 84342 | 67244 | 00287 | 65751 | 07127 | 73612 |
| 81234 | 01182 | 44518 | 64987 | 11851 | 19002 | 68023 | 62066 | 09255 | 37819 |
| 59901 | 71232 | 23240 | 19522 | 20370 | 27161 | 55978 | 53719 | 68202 | 31228 |
| 92223 | 79716 | 02328 | 01997 | 62503 | 20334 | 58423 | 64475 | 87316 | 54437 |
| 11996 | 12163 | 72186 | 56014 | 07710 | 99382 | 87634 | 46264 | 19112 | 37643 |
| 66149 | 87309 | 24997 | 47847 | 77983 | 07306 | 10797 | 29757 | 65021 | 69776 |
| 43150 | 38032 | 22724 | 80494 | 76011 | 71307 | 58463 | 28424 | 18134 | 36807 |
| 28329 | 02029 | 95327 | 24418 | 46878 | 50145 | 98773 | 58391 | 27509 | 73647 |
| 90233 | 44560 | 53103 | 34723 | 69566 | 79606 | 48217 | 21452 | 64307 | 15669 |
| 85599 | 26286 | 04717 | 85037 | 41949 | 51354 | 04480 | 38604 | 98005 | 81348 |
| 03318 | 96186 | 78473 | 17924 | 10641 | 13054 | 28822 | 06045 | 54570 | 34623 |
| 99347 | 80818 | 73112 | 04087 | 99492 | 84318 | 69910 | 64168 | 65521 | 49261 |
| 45312 | 31783 | 25332 | 09625 | 18186 | 93971 | 57051 | 43181 | 58233 | 24514 |
| 03715 | 98307 | 73341 | 28673 | 66513 | 34367 | 29743 | 87445 | 15807 | 76248 |
| 83327 | 62870 | 03390 | 90121 | 72610 | 36364 | 53494 | 59485 | 97578 | 26706 |
| 91972 | 89616 | 14225 | 48910 | 35095 | 24591 | 64841 | 20686 | 03529 | 03159 |
| 24214 | 00424 | 62228 | 51715 | 78002 | 62305 | 02200 | 01230 | 49056 | 54599 |
| 80804 | 43832 | 93639 | 93061 | 07127 | 68452 | 76218 | 82721 | 35526 | 84893 |
| 74825 | 60309 | 72573 | 42393 | 59041 | 88108 | 16049 | 32493 | 29581 | 88510 |
| 65897 | 19446 | 05786 | 64420 | 34324 | 46689 | 44218 | 85993 | 08430 | 09169 |
| 15141 | 64397 | 47854 | 99613 | 24803 | 84642 | 82323 | 93751 | 04265 | 69082 |
| 96033 | 13763 | 97887 | 76335 | 92443 | 68115 | 64872 | 26034 | 00704 | 78649 |
| 55055 | 39617 | 14945 | 23624 | 93152 | 60108 | 65247 | 82868 | 04222 | 44153 |
| 82751 | 78749 | 28298 | 62274 | 26052 | 75785 | 71918 | 67998 | 59505 | 97930 |
| 83524 | 91593 | 62696 | 99881 | 21413 | 26934 | 07669 | 53822 | 20294 | 56925 |
| 32342 | 27407 | 76931 | 39016 | 76077 | 13803 | 43305 | 19828 | 91916 | 30235 |
| 12388 | 81304 | 56500 | 44577 | 29729 | 46518 | 53433 | 76474 | 90350 | 16517 |
| 01465 | 43325 | 10220 | 23459 | 05951 | 72093 | 80633 | 41522 | 13286 | 58256 |
| 00159 | 04004 | 32131 | 74225 | 94037 | 83851 | 62335 | 10525 | 49330 | 60024 |
| 77377 | 11672 | 09509 | 00933 | 85210 | 05232 | 76958 | 87665 | 92518 | 16569 |
| 71753 | 52104 | 67451 | 76706 | 96569 | 10546 | 51279 | 85627 | 78486 | 83984 |
| 18070 | 77088 | 75566 | 48506 | 37667 | 98745 | 86510 | 20111 | 60387 | 31912 |
| 11261 | 43819 | 82989 | 01517 | 32518 | 87069 | 22459 | 60148 | 19312 | 27672 |
| 96725 | 73465 | 45806 | 45493 | 65015 | 50011 | 53284 | 48677 | 71217 | 93572 |
| 86925 | 17276 | 38091 | 21710 | 40501 | 27595 | 58336 | 75779 | 49878 | 95061 |
| 91997 | 77129 | 75746 | 43200 | 49688 | 98100 | 68611 | 83768 | 48236 | 91781 |
| 89280 | 54045 | 21993 | 50186 | 46614 | 55688 | 88916 | 73782 | 52122 | 61095 |
| 39876 | 60385 | 35182 | 49396 | 96414 | 15734 | 74411 | 78617 | 88641 | 52187 |
| 23107 | 28726 | 81832 | 42661 | 74080 | 41561 | 82608 | 32770 | 82996 | 50497 |
| 99051 | 21576 | 72976 | 18826 | 74166 | 06298 | 19618 | 40205 | 92899 | 21495 |
| 03122 | 06879 | 13480 | 59470 | 11095 | 81765 | 11423 | 26991 | 32760 | 37734 |
| 68175 | 37457 | 33428 | 15663 | 70894 | 38932 | 73993 | 36964 | 32356 | 68266 |
| 87324 | 64139 | 63203 | 50948 | 18062 | 19532 | 09550 | 01580 | 56785 | 14534 |
| 34840 | 80545 | 31256 | 31107 | 20585 | 82058 | 90026 | 35309 | 15733 | 67671 |
| 72012 | 50162 | 43983 | 57339 | 69563 | 93115 | 75280 | 56463 | 25308 | 01170 |
| 72765 | 33642 | 08638 | 45049 | 61180 | 67469 | 81391 | 70920 | 51706 | 05180 |
| 64920 | 90557 | 24929 | 22057 | 19608 | 11962 | 37682 | 74516 | 42058 | 46001 |
| 03231 | 34203 | 19686 | 53727 | 64325 | 40345 | 07136 | 76322 | 74054 | 90746 |
| 62957 | 96072 | 83457 | 52342 | 27652 | 98076 | 57729 | 96039 | 38223 | 52588 |
| 86338 | 75154 | 01894 | 42236 | 61405 | 14873 | 77368 | 19187 | 12546 | 52241 |
| 54052 | 83338 | 03670 | 93158 | 11863 | 98680 | 73183 | 54486 | 65759 | 54247 |
| 61671 | 80453 | 37535 | 51507 | 28414 | 38239 | 57942 | 12745 | 43716 | 61155 |
| 35367 | 04826 | 39577 | 68441 | 50504 | 73197 | 34903 | 17617 | 63535 | 83999 |

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| 69327 | 10994 | 71070 | 01585 | 54454 | 88574 | 54695 | 28254 | 24729 | 40866 |
| 63674 | 31733 | 71126 | 30353 | 17370 | 45979 | 23119 | 26982 | 57936 | 23045 |
| 89031 | 81858 | 71489 | 75192 | 53070 | 33667 | 98574 | 78420 | 57009 | 76688 |
| 97513 | 71707 | 02704 | 09212 | 25655 | 61067 | 53539 | 85610 | 47770 | 28814 |
| 28913 | 33643 | 54058 | 60941 | 91942 | 88109 | 88858 | 61170 | 67661 | 44952 |
| 16217 | 66322 | 49696 | 25604 | 49474 | 97528 | 41526 | 80956 | 23327 | 05130 |
| 59522 | 76946 | 64136 | 67023 | 34578 | 80177 | 92725 | 43578 | 92280 | 28350 |
| 17716 | 74153 | 34018 | 12957 | 57185 | 22062 | 49564 | 88625 | 96024 | 13428 |
| 54349 | 44535 | 99975 | 26435 | 56196 | 03923 | 92589 | 53414 | 84363 | 24133 |
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