

Smarandache friendly numbers-another approach

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Abstract One approach to Smarandache friendly numbers is given by A. Murthy, who defined them Ref [1]. Another approach is presented here.

Keywords Smarandache friendly numbers.

Smarandache friendly numbers were defined by A. Murthy [1] as follows.

Definition 1. If the sum of any set of consecutive terms of a sequence is equal to the product of first and last number, then the first and the last numbers are called a pair of Smarandache friendly numbers.

Here, we will consider a sequence of natural numbers.

1. It is easy to note that (3, 6) is a friendly pair as $3 + 4 + 5 + 6 = 18 = 3 \cdot 6$.

2. By elementary operations and trial, we can find such pairs, but as magnitude of natural numbers increases, this work becomes tedious. Hence an algorithm is presented here.

Assume that (m, n) is a pair of friendly numbers, $n > m$, so that

$$m + (m + 1) + (m + 2) + \cdots + n = m \cdot n.$$

Let $n = m + k$, where k is a natural number. Then the above equation becomes

$$m + (m + 1) + (m + 2) + \cdots + n = m \cdot (m + k).$$

On simplification, this gives,

$$k^2 + k - 2(m^2 - m) = 0.$$

That is,

$$k = \frac{-1 + \sqrt{1 + 8(m^2 - m)}}{2},$$

considering the positive sign only.

Now, k will be a natural number only if $1 + 8(m^2 - m)$ is a perfect square of an odd natural number.

For $m = 3$, we have $k = 3$, so that $n = 3 + 3 = 6$, and then $(3, 6)$ are friendly numbers as we observed earlier.

For $m = 5$, $k = \frac{-1 + \sqrt{161}}{2}$, which is not an integer. Hence k does not exist for every m .

For $m = 15$, $k = 20$, hence $n = 35$. So the next pair of friendly numbers is $(15, 35)$. Other pairs are $(85, 204)$ and $(493, 1189)$.

At the end, the list of m and $1 + 8(m^2 - m)$ is given using a computer software.

2. If (m, n) is a friendly pair, of natural numbers, then it is conjectured that $(m + 2n, 2m + 5n - 1)$ is also a friendly pair.

Since, $(3, 6)$ and $(15, 35)$ are friendly pairs, we have $3x + 6y = 15$ and $3p + 6q = 35$, for some x, y, p, q being natural numbers. These equations are true for $x = 1, y = 2, p = 2$ and $q = 5$. With 1 to be subtracted from second equation.

These solutions are unique, hence this conjecture.

This suggests that there are infinite pairs of friendly natural numbers.

Definition 2. [1] x and y are primes. They are called Smarandache friendly primes if the sum of any set of consecutive primes, whose first term is x and last is y , is equal to their product $x \cdot y$.

Example. $(2, 5), (3, 13), (5, 31)$ are pairs of friendly primes, for $3 + 5 + 7 + 11 + 13 = 39 = 3 \cdot 13$.

Since the primes are not uniformly distributed, an algorithm for friendly primes seems to be impossible.

4. For various sequences, different pairs of friendly numbers can be obtained.

The values of $m \leq 1000$ and $1 + 8(m^2 - m)$ are given below. Those with perfect squares are underlined. Only four pairs were obtained.

| | | | | | | | | | |
|----|----------|----|----------|----------|---------------|----|----------|-----------|----------------|
| 1 | 1.0000 | 2 | 4.1231 | <u>3</u> | <u>7.0000</u> | 4 | 9.8489 | 5 | 12.6886 |
| 6 | 15.5242 | 7 | 18.3576 | 8 | 21.1896 | 9 | 24.0208 | 10 | 26.8514 |
| 11 | 29.6816 | 12 | 32.5115 | 13 | 35.3412 | 14 | 38.1707 | <u>15</u> | <u>41.0000</u> |
| 16 | 43.8292 | 17 | 46.6583 | 18 | 49.4874 | 19 | 52.3163 | 20 | 55.1453 |
| 21 | 57.9741 | 22 | 60.8030 | 23 | 63.6318 | 24 | 66.4605 | 25 | 69.2892 |
| 26 | 72.1180 | 27 | 74.9466 | 28 | 77.7753 | 29 | 80.6040 | 30 | 83.4326 |
| 31 | 86.2612 | 32 | 89.0898 | 33 | 91.9184 | 34 | 94.7470 | 35 | 97.5756 |
| 36 | 100.4042 | 37 | 103.2327 | 38 | 106.0613 | 39 | 108.8899 | 40 | 111.7184 |
| 41 | 114.5469 | 42 | 117.3755 | 43 | 120.2040 | 44 | 123.0325 | 45 | 125.8610 |
| 46 | 128.6895 | 47 | 131.5181 | 48 | 134.3466 | 49 | 137.1751 | 50 | 140.0036 |
| 51 | 142.8321 | 52 | 145.6606 | 53 | 148.4891 | 54 | 151.3176 | 55 | 154.1460 |
| 56 | 156.9745 | 57 | 159.8030 | 58 | 162.6315 | 59 | 165.4600 | 60 | 168.2884 |
| 61 | 171.1169 | 62 | 173.9454 | 63 | 176.7739 | 64 | 179.6023 | 65 | 182.4308 |
| 66 | 185.2593 | 67 | 188.0877 | 68 | 190.9162 | 69 | 193.7447 | 70 | 196.5731 |

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|-----|----------|-----|----------|-----|----------|-----|----------|-----------|-----------------|
| 71 | 199.4016 | 72 | 202.2301 | 73 | 205.0585 | 74 | 207.8870 | 75 | 210.7155 |
| 76 | 213.5439 | 77 | 216.3724 | 78 | 219.2008 | 79 | 222.0293 | 80 | 224.8577 |
| 81 | 227.6862 | 82 | 230.5146 | 83 | 233.3431 | 84 | 236.1716 | 85 | 239.0000 |
| 86 | 241.8284 | 87 | 244.6569 | 88 | 247.4854 | 89 | 250.3138 | 90 | 253.1423 |
| 91 | 255.9707 | 92 | 258.7992 | 93 | 261.6276 | 94 | 264.4561 | 95 | 267.2845 |
| 96 | 270.1129 | 97 | 272.9414 | 98 | 275.7698 | 99 | 278.5983 | 100 | 281.4267 |
| 101 | 284.2552 | 102 | 287.0836 | 103 | 289.9120 | 104 | 292.7405 | 105 | 295.5689 |
| 106 | 298.3974 | 107 | 301.2258 | 108 | 304.0543 | 109 | 306.8827 | 110 | 309.7112 |
| 111 | 312.5396 | 112 | 315.3680 | 113 | 318.1965 | 114 | 321.0249 | 115 | 323.8534 |
| 116 | 326.6818 | 117 | 329.5103 | 118 | 332.3387 | 119 | 335.1671 | 120 | 337.9956 |
| 121 | 340.8240 | 122 | 343.6524 | 123 | 346.4809 | 124 | 349.3093 | 125 | 352.1378 |
| 126 | 354.9662 | 127 | 357.7946 | 128 | 360.6231 | 129 | 363.4515 | 130 | 366.2799 |
| 131 | 369.1084 | 132 | 371.9368 | 133 | 374.7653 | 134 | 377.5937 | 135 | 380.4221 |
| 136 | 383.2506 | 137 | 386.0790 | 138 | 388.9074 | 139 | 391.7359 | 140 | 394.5643 |
| 141 | 397.3928 | 142 | 400.2212 | 143 | 403.0496 | 144 | 405.8781 | 145 | 408.7065 |
| 146 | 411.5349 | 147 | 414.3634 | 148 | 417.1918 | 149 | 420.0202 | 150 | 422.8487 |
| 151 | 425.6771 | 152 | 428.5056 | 153 | 431.3340 | 154 | 434.1624 | 155 | 436.9908 |
| 156 | 439.8193 | 157 | 442.6477 | 158 | 445.4761 | 159 | 448.3046 | 160 | 451.1330 |
| 161 | 453.9615 | 162 | 456.7899 | 163 | 459.6183 | 164 | 462.4467 | 165 | 465.2752 |
| 166 | 468.1036 | 167 | 470.9321 | 168 | 473.7605 | 169 | 476.5889 | 170 | 479.4174 |
| 171 | 482.2458 | 172 | 485.0742 | 173 | 487.9026 | 174 | 490.7311 | 175 | 493.5595 |
| 176 | 496.3879 | 177 | 499.2164 | 178 | 502.0448 | 179 | 504.8733 | 180 | 507.7017 |
| 181 | 510.5301 | 182 | 513.3585 | 183 | 516.1870 | 184 | 519.0154 | 185 | 521.8439 |
| 186 | 524.6723 | 187 | 527.5007 | 188 | 530.3292 | 189 | 533.1576 | 190 | 535.9860 |
| 191 | 538.8145 | 192 | 541.6429 | 193 | 544.4713 | 194 | 547.2997 | 195 | 550.1282 |
| 196 | 552.9566 | 197 | 555.7850 | 198 | 558.6135 | 199 | 561.4419 | 200 | 564.2703 |
| 201 | 567.0988 | 202 | 569.9272 | 203 | 572.7556 | 204 | 575.5840 | 205 | 578.4125 |
| 206 | 581.2409 | 207 | 584.0693 | 208 | 586.8978 | 209 | 589.7262 | 210 | 592.5546 |
| 211 | 595.3831 | 212 | 598.2115 | 213 | 601.0399 | 214 | 603.8683 | 215 | 606.6968 |
| 216 | 609.5252 | 217 | 612.3536 | 218 | 615.1821 | 219 | 618.0105 | 220 | 620.8389 |
| 221 | 623.6674 | 222 | 626.4958 | 223 | 629.3242 | 224 | 632.1526 | 225 | 634.9811 |
| 226 | 637.8095 | 227 | 640.6379 | 228 | 643.4664 | 229 | 646.2948 | 230 | 649.1232 |
| 231 | 651.9517 | 232 | 654.7801 | 233 | 657.6085 | 234 | 660.4370 | 235 | 663.2654 |
| 236 | 666.0938 | 237 | 668.9222 | 238 | 671.7507 | 239 | 674.5791 | 240 | 677.4075 |
| 241 | 680.2360 | 242 | 683.0644 | 243 | 685.8928 | 244 | 688.7213 | 245 | 691.5497 |
| 246 | 694.3781 | 247 | 697.2065 | 248 | 700.0350 | 249 | 702.8634 | 250 | 705.6918 |
| 251 | 708.5203 | 252 | 711.3487 | 253 | 714.1771 | 254 | 717.0056 | 255 | 719.8340 |
| 256 | 722.6624 | 257 | 725.4908 | 258 | 728.3193 | 259 | 731.1477 | 260 | 733.9761 |
| 261 | 736.8046 | 262 | 739.6330 | 263 | 742.4614 | 264 | 745.2899 | 265 | 748.1183 |
| 266 | 750.9467 | 267 | 753.7751 | 268 | 756.6036 | 269 | 759.4320 | 270 | 762.2604 |

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|-----|-----------|-----|-----------|-----|-----------|-----|-----------|
| 271 | 765.0889 | 272 | 767.9173 | 273 | 770.7457 | 274 | 73.5742 |
| 275 | 776.4026 | 276 | 779.2310 | 277 | 782.0594 | 278 | 784.8879 |
| 279 | 787.7163 | 280 | 790.5447 | 281 | 793.3732 | 282 | 796.2016 |
| 283 | 799.0300 | 284 | 801.8585 | 285 | 804.6869 | 286 | 807.5153 |
| 287 | 810.3438 | 288 | 813.1722 | 289 | 816.0006 | 290 | 818.8290 |
| 291 | 821.6575 | 292 | 824.4859 | 293 | 827.3143 | 294 | 830.1428 |
| 295 | 832.9712 | 296 | 835.7996 | 297 | 838.6281 | 298 | 841.4565 |
| 299 | 844.2849 | 300 | 847.1133 | 301 | 849.9418 | 302 | 852.7702 |
| 303 | 855.5986 | 304 | 858.4271 | 305 | 861.2555 | 306 | 864.0839 |
| 307 | 866.9124 | 308 | 869.7408 | 309 | 872.5692 | 310 | 875.3976 |
| 311 | 878.2261 | 312 | 881.0545 | 313 | 883.8829 | 314 | 886.7114 |
| 315 | 889.5398 | 316 | 892.3682 | 317 | 895.1967 | 318 | 898.0251 |
| 319 | 900.8535 | 320 | 903.6819 | 321 | 906.5103 | 322 | 909.3387 |
| 323 | 912.1672 | 324 | 914.9956 | 325 | 917.8240 | 326 | 920.6525 |
| 327 | 923.4809 | 328 | 926.3093 | 329 | 929.1378 | 330 | 931.9662 |
| 331 | 934.7946 | 332 | 937.6230 | 333 | 940.4515 | 334 | 943.2799 |
| 335 | 946.1083 | 336 | 948.9368 | 337 | 951.7652 | 338 | 954.5936 |
| 339 | 957.4221 | 340 | 960.2505 | 341 | 963.0789 | 342 | 965.9073 |
| 343 | 968.7358 | 344 | 971.5642 | 345 | 974.3926 | 346 | 977.2211 |
| 347 | 980.0495 | 348 | 982.8779 | 349 | 985.7064 | 350 | 988.5348 |
| 351 | 991.3632 | 352 | 994.1917 | 353 | 997.0201 | 354 | 999.8485 |
| 355 | 1002.6769 | 356 | 1005.5054 | 357 | 1008.3338 | 358 | 1011.1622 |
| 359 | 1013.9907 | 360 | 1016.8190 | 361 | 1019.6475 | 362 | 1022.4759 |
| 363 | 1025.3043 | 364 | 1028.1328 | 365 | 1030.9612 | 366 | 1033.7897 |
| 367 | 1036.6180 | 368 | 1039.4465 | 369 | 1042.2749 | 370 | 1045.1034 |
| 371 | 1047.9318 | 372 | 1050.7603 | 373 | 1053.5886 | 374 | 1056.4171 |
| 375 | 1059.2455 | 376 | 1062.0740 | 377 | 1064.9023 | 378 | 1067.7307 |
| 379 | 1070.5592 | 380 | 1073.3876 | 381 | 1076.2161 | 382 | 1079.0444 |
| 383 | 1081.8729 | 384 | 1084.7013 | 385 | 1087.5298 | 386 | 1090.3582 |
| 387 | 1093.1866 | 388 | 1096.0150 | 389 | 1098.8435 | 390 | 1101.6719 |
| 391 | 1104.5004 | 392 | 1107.3287 | 393 | 1110.1572 | 394 | 1112.9856 |
| 395 | 1115.8141 | 396 | 1118.6425 | 397 | 1121.4709 | 398 | 1124.2993 |
| 399 | 1127.1278 | 400 | 1129.9562 | 401 | 1132.7847 | 402 | 1135.6130 |
| 403 | 1138.4415 | 404 | 1141.2699 | 405 | 1144.0984 | 406 | 1146.9268 |
| 407 | 1149.7552 | 408 | 1152.5836 | 409 | 1155.4120 | 410 | 1158.2405 |
| 411 | 1161.0688 | 412 | 1163.8973 | 413 | 1166.7257 | 414 | 1169.5542 |
| 415 | 1172.3826 | 416 | 1175.2111 | 417 | 1178.0394 | 418 | 1180.8679 |
| 419 | 1183.6963 | 420 | 1186.5248 | 421 | 1189.3531 | 422 | 1192.1816 |
| 423 | 1195.0100 | 424 | 1197.8385 | 425 | 1200.6669 | 426 | 1203.4954 |
| 427 | 1206.3237 | 428 | 1209.1522 | 429 | 1211.9806 | 430 | 1214.8091 |

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|-----|-----------|-----|-----------|------------|------------------|-----|-----------|
| 431 | 1217.6375 | 432 | 1220.4659 | 433 | 1223.2943 | 434 | 1226.1228 |
| 435 | 1228.9512 | 436 | 1231.7797 | 437 | 1234.6080 | 438 | 1237.4365 |
| 439 | 1240.2649 | 440 | 1243.0933 | 441 | 1245.9218 | 442 | 1248.7501 |
| 443 | 1251.5786 | 444 | 1254.4070 | 445 | 1257.2355 | 446 | 1260.0638 |
| 447 | 1262.8923 | 448 | 1265.7207 | 449 | 1268.5492 | 450 | 1271.3776 |
| 451 | 1274.2061 | 452 | 1277.0344 | 453 | 1279.8629 | 454 | 1282.6913 |
| 455 | 1285.5198 | 456 | 1288.3481 | 457 | 1291.1766 | 458 | 1294.0050 |
| 459 | 1296.8335 | 460 | 1299.6619 | 461 | 1302.4904 | 462 | 1305.3187 |
| 463 | 1308.1472 | 464 | 1310.9756 | 465 | 1313.8041 | 466 | 1316.6324 |
| 467 | 1319.4608 | 468 | 1322.2893 | 469 | 1325.1177 | 470 | 1327.9462 |
| 471 | 1330.7745 | 472 | 1333.6030 | 473 | 1336.4314 | 474 | 1339.2599 |
| 475 | 1342.0883 | 476 | 1344.9167 | 477 | 1347.7451 | 478 | 1350.5736 |
| 479 | 1353.4020 | 480 | 1356.2305 | 481 | 1359.0588 | 482 | 1361.8873 |
| 483 | 1364.7157 | 484 | 1367.5442 | 485 | 1370.3726 | 486 | 1373.2010 |
| 487 | 1376.0294 | 488 | 1378.8579 | 489 | 1381.6863 | 490 | 1384.5148 |
| 491 | 1387.3431 | 492 | 1390.1716 | 493 | 1393.0000 | 494 | 1395.8284 |
| 495 | 1398.6569 | 496 | 1401.4852 | 497 | 1404.3137 | 498 | 1407.1421 |
| 499 | 1409.9706 | 500 | 1412.7990 | 501 | 1415.6274 | 502 | 1418.4558 |
| 503 | 1421.2843 | 504 | 1424.1127 | 505 | 1426.9412 | 506 | 1429.7695 |
| 507 | 1432.5980 | 508 | 1435.4264 | 509 | 1438.2549 | 510 | 1441.0833 |
| 511 | 1443.9117 | 512 | 1446.7401 | 513 | 1449.5686 | 514 | 1452.3970 |
| 515 | 1455.2255 | 516 | 1458.0538 | 517 | 1460.8823 | 518 | 1463.7107 |
| 519 | 1466.5391 | 520 | 1469.3676 | 521 | 1472.1959 | 522 | 1475.0244 |
| 523 | 1477.8528 | 524 | 1480.6813 | 525 | 1483.5096 | 526 | 1486.3381 |
| 527 | 1489.1665 | 528 | 1491.9950 | 529 | 1494.8234 | 530 | 1497.6519 |
| 531 | 1500.4802 | 532 | 1503.3087 | 533 | 1506.1371 | 534 | 1508.9656 |
| 535 | 1511.7939 | 536 | 1514.6224 | 537 | 1517.4508 | 538 | 1520.2793 |
| 539 | 1523.1077 | 540 | 1525.9362 | 541 | 1528.7645 | 542 | 1531.5930 |
| 543 | 1534.4214 | 544 | 1537.2499 | 545 | 1540.0782 | 546 | 1542.9066 |
| 547 | 1545.7351 | 548 | 1548.5635 | 549 | 1551.3920 | 550 | 1554.2203 |
| 551 | 1557.0488 | 552 | 1559.8772 | 553 | 1562.7057 | 554 | 1565.5341 |
| 555 | 1568.3625 | 556 | 1571.1909 | 557 | 1574.0194 | 558 | 1576.8478 |
| 559 | 1579.6763 | 560 | 1582.5046 | 561 | 1585.3331 | 562 | 1588.1615 |
| 563 | 1590.9900 | 564 | 1593.8184 | 565 | 1596.6469 | 566 | 1599.4752 |
| 567 | 1602.3037 | 568 | 1605.1321 | 569 | 1607.9604 | 570 | 1610.7889 |
| 571 | 1613.6173 | 572 | 1616.4458 | 573 | 1619.2742 | 574 | 1622.1027 |
| 575 | 1624.9310 | 576 | 1627.7595 | 577 | 1630.5879 | 578 | 1633.4164 |
| 579 | 1636.2448 | 580 | 1639.0732 | 581 | 1641.9016 | 582 | 1644.7301 |
| 583 | 1647.5585 | 584 | 1650.3870 | 585 | 1653.2153 | 586 | 1656.0438 |
| 587 | 1658.8722 | 588 | 1661.7007 | 589 | 1664.5291 | 590 | 1667.3575 |

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|-----|-----------|-----|-----------|-----|-----------|-----|-----------|
| 591 | 1670.1859 | 592 | 1673.0144 | 593 | 1675.8428 | 594 | 1678.6711 |
| 595 | 1681.4996 | 596 | 1684.3280 | 597 | 1687.1565 | 598 | 1689.9849 |
| 599 | 1692.8134 | 600 | 1695.6417 | 601 | 1698.4702 | 602 | 1701.2986 |
| 603 | 1704.1271 | 604 | 1706.9554 | 605 | 1709.7839 | 606 | 1712.6123 |
| 607 | 1715.4408 | 608 | 1718.2692 | 609 | 1721.0977 | 610 | 1723.9260 |
| 611 | 1726.7545 | 612 | 1729.5829 | 613 | 1732.4114 | 614 | 1735.2397 |
| 615 | 1738.0682 | 616 | 1740.8966 | 617 | 1743.7250 | 618 | 1746.5535 |
| 619 | 1749.3818 | 620 | 1752.2103 | 621 | 1755.0387 | 622 | 1757.8672 |
| 623 | 1760.6956 | 624 | 1763.5240 | 625 | 1766.3524 | 626 | 1769.1809 |
| 627 | 1772.0093 | 628 | 1774.8378 | 629 | 1777.6661 | 630 | 1780.4946 |
| 631 | 1783.3230 | 632 | 1786.1515 | 633 | 1788.9799 | 634 | 1791.8083 |
| 635 | 1794.6367 | 636 | 1797.4652 | 637 | 1800.2936 | 638 | 1803.1221 |
| 639 | 1805.9504 | 640 | 1808.7789 | 641 | 1811.6073 | 642 | 1814.4357 |
| 643 | 1817.2642 | 644 | 1820.0925 | 645 | 1822.9210 | 646 | 1825.7494 |
| 647 | 1828.5779 | 648 | 1831.4063 | 649 | 1834.2347 | 650 | 1837.0631 |
| 651 | 1839.8916 | 652 | 1842.7200 | 653 | 1845.5485 | 654 | 1848.3768 |
| 655 | 1851.2053 | 656 | 1854.0337 | 657 | 1856.8622 | 658 | 1859.6906 |
| 659 | 1862.5190 | 660 | 1865.3474 | 661 | 1868.1759 | 662 | 1871.0043 |
| 663 | 1873.8328 | 664 | 1876.6611 | 665 | 1879.4895 | 666 | 1882.3180 |
| 667 | 1885.1464 | 668 | 1887.9749 | 669 | 1890.8032 | 670 | 1893.6317 |
| 671 | 1896.4601 | 672 | 1899.2886 | 673 | 1902.1169 | 674 | 1904.9454 |
| 675 | 1907.7738 | 676 | 1910.6023 | 677 | 1913.4307 | 678 | 1916.2592 |
| 679 | 1919.0875 | 680 | 1921.9160 | 681 | 1924.7444 | 682 | 1927.5729 |
| 683 | 1930.4012 | 684 | 1933.2297 | 685 | 1936.0581 | 686 | 1938.8866 |
| 687 | 1941.7150 | 688 | 1944.5433 | 689 | 1947.3718 | 690 | 1950.2002 |
| 691 | 1953.0287 | 692 | 1955.8571 | 693 | 1958.6855 | 694 | 1961.5139 |
| 695 | 1964.3424 | 696 | 1967.1708 | 697 | 1969.9993 | 698 | 1972.8276 |
| 699 | 1975.6561 | 700 | 1978.4845 | 701 | 1981.3130 | 702 | 1984.1414 |
| 703 | 1986.9698 | 704 | 1989.7982 | 705 | 1992.6267 | 706 | 1995.4551 |
| 707 | 1998.2836 | 708 | 2001.1119 | 709 | 2003.9403 | 710 | 2006.7688 |
| 711 | 2009.5972 | 712 | 2012.4257 | 713 | 2015.2540 | 714 | 2018.0825 |
| 715 | 2020.9109 | 716 | 2023.7394 | 717 | 2026.5677 | 718 | 2029.3962 |
| 719 | 2032.2246 | 720 | 2035.0531 | 721 | 2037.8815 | 722 | 2040.7100 |
| 723 | 2043.5383 | 724 | 2046.3668 | 725 | 2049.1953 | 726 | 2052.0237 |
| 727 | 2054.8521 | 728 | 2057.6804 | 729 | 2060.5090 | 730 | 2063.3374 |
| 731 | 2066.1658 | 732 | 2068.9941 | 733 | 2071.8225 | 734 | 2074.6511 |
| 735 | 2077.4795 | 736 | 2080.3079 | 737 | 2083.1362 | 738 | 2085.9648 |
| 739 | 2088.7932 | 740 | 2091.6216 | 741 | 2094.4500 | 742 | 2097.2786 |
| 743 | 2100.1069 | 744 | 2102.9353 | 745 | 2105.7637 | 746 | 2108.5923 |
| 747 | 2111.4207 | 748 | 2114.2490 | 749 | 2117.0774 | 750 | 2119.9060 |

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|-----|-----------|-----|-----------|-----|-----------|-----|-----------|
| 751 | 2122.7344 | 752 | 2125.5627 | 753 | 2128.3911 | 754 | 2131.2195 |
| 755 | 2134.0481 | 756 | 2136.8765 | 757 | 2139.7048 | 758 | 2142.5332 |
| 759 | 2145.3618 | 760 | 2148.1902 | 761 | 2151.0186 | 762 | 2153.8469 |
| 763 | 2156.6755 | 764 | 2159.5039 | 765 | 2162.3323 | 766 | 2165.1606 |
| 767 | 2167.9893 | 768 | 2170.8176 | 769 | 2173.6460 | 770 | 2176.4744 |
| 771 | 2179.3030 | 772 | 2182.1313 | 773 | 2184.9597 | 774 | 2187.7881 |
| 775 | 2190.6167 | 776 | 2193.4451 | 777 | 2196.2734 | 778 | 2199.1018 |
| 779 | 2201.9302 | 780 | 2204.7588 | 781 | 2207.5872 | 782 | 2210.4155 |
| 783 | 2213.2439 | 784 | 2216.0725 | 785 | 2218.9009 | 786 | 2221.7292 |
| 787 | 2224.5576 | 788 | 2227.3862 | 789 | 2230.2146 | 790 | 2233.0430 |
| 791 | 2235.8713 | 792 | 2238.7000 | 793 | 2241.5283 | 794 | 2244.3567 |
| 795 | 2247.1851 | 796 | 2250.0137 | 797 | 2252.8420 | 798 | 2255.6704 |
| 799 | 2258.4988 | 800 | 2261.3271 | 801 | 2264.1558 | 802 | 2266.9841 |
| 803 | 2269.8125 | 804 | 2272.6409 | 805 | 2275.4695 | 806 | 2278.2979 |
| 807 | 2281.1262 | 808 | 2283.9546 | 809 | 2286.7832 | 810 | 2289.6116 |
| 811 | 2292.4399 | 812 | 2295.2683 | 813 | 2298.0969 | 814 | 2300.9253 |
| 815 | 2303.7537 | 816 | 2306.5820 | 817 | 2309.4106 | 818 | 2312.2390 |
| 819 | 2315.0674 | 820 | 2317.8958 | 821 | 2320.7241 | 822 | 2323.5527 |
| 823 | 2326.3811 | 824 | 2329.2095 | 825 | 2332.0378 | 826 | 2334.8665 |
| 827 | 2337.6948 | 828 | 2340.5232 | 829 | 2343.3516 | 830 | 2346.1802 |
| 831 | 2349.0085 | 832 | 2351.8369 | 833 | 2354.6653 | 834 | 2357.4939 |
| 835 | 2360.3223 | 836 | 2363.1506 | 837 | 2365.9790 | 838 | 2368.8076 |
| 839 | 2371.6360 | 840 | 2374.4644 | 841 | 2377.2927 | 842 | 2380.1211 |
| 843 | 2382.9497 | 844 | 2385.7781 | 845 | 2388.6064 | 846 | 2391.4348 |
| 847 | 2394.2634 | 848 | 2397.0918 | 849 | 2399.9202 | 850 | 2402.7485 |
| 851 | 2405.5771 | 852 | 2408.4055 | 853 | 2411.2339 | 854 | 2414.0623 |
| 855 | 2416.8909 | 856 | 2419.7192 | 857 | 2422.5476 | 858 | 2425.3760 |
| 859 | 2428.2046 | 860 | 2431.0330 | 861 | 2433.8613 | 862 | 2436.6897 |
| 863 | 2439.5183 | 864 | 2442.3467 | 865 | 2445.1750 | 866 | 2448.0034 |
| 867 | 2450.8318 | 868 | 2453.6604 | 869 | 2456.4888 | 870 | 2459.3171 |
| 871 | 2462.1455 | 872 | 2464.9741 | 873 | 2467.8025 | 874 | 2470.6309 |
| 875 | 2473.4592 | 876 | 2476.2878 | 877 | 2479.1162 | 878 | 2481.9446 |
| 879 | 2484.7729 | 880 | 2487.6016 | 881 | 2490.4299 | 882 | 2493.2583 |
| 883 | 2496.0867 | 884 | 2498.9153 | 885 | 2501.7437 | 886 | 2504.5720 |
| 887 | 2507.4004 | 888 | 2510.2288 | 889 | 2513.0574 | 890 | 2515.8857 |
| 891 | 2518.7141 | 892 | 2521.5425 | 893 | 2524.3711 | 894 | 2527.1995 |
| 895 | 2530.0278 | 896 | 2532.8562 | 897 | 2535.6848 | 898 | 2538.5132 |
| 899 | 2541.3416 | 900 | 2544.1699 | 901 | 2546.9985 | 902 | 2549.8269 |
| 903 | 2552.6553 | 904 | 2555.4836 | 905 | 2558.3123 | 906 | 2561.1406 |
| 907 | 2563.9690 | 908 | 2566.7974 | 909 | 2569.6257 | 910 | 2572.4543 |

| | | | | | | | |
|-----|-----------|------|-----------|-----|-----------|-----|-----------|
| 911 | 2575.2827 | 912 | 2578.1111 | 913 | 2580.9395 | 914 | 2583.7681 |
| 915 | 2586.5964 | 916 | 2589.4248 | 917 | 2592.2532 | 918 | 2595.0818 |
| 919 | 2597.9102 | 920 | 2600.7385 | 921 | 2603.5669 | 922 | 2606.3955 |
| 923 | 2609.2239 | 924 | 2612.0522 | 925 | 2614.8806 | 926 | 2617.7092 |
| 927 | 2620.5376 | 928 | 2623.3660 | 929 | 2626.1943 | 930 | 2629.0227 |
| 931 | 2631.8513 | 932 | 2634.6797 | 933 | 2637.5081 | 934 | 2640.3364 |
| 935 | 2643.1650 | 936 | 2645.9934 | 937 | 2648.8218 | 938 | 2651.6501 |
| 939 | 2654.4788 | 940 | 2657.3071 | 941 | 2660.1355 | 942 | 2662.9639 |
| 943 | 2665.7925 | 944 | 2668.6208 | 945 | 2671.4492 | 946 | 2674.2776 |
| 947 | 2677.1062 | 948 | 2679.9346 | 949 | 2682.7629 | 950 | 2685.5913 |
| 951 | 2688.4197 | 952 | 2691.2483 | 953 | 2694.0767 | 954 | 2696.9050 |
| 955 | 2699.7334 | 956 | 2702.5620 | 957 | 2705.3904 | 958 | 2708.2188 |
| 959 | 2711.0471 | 960 | 2713.8757 | 961 | 2716.7041 | 962 | 2719.5325 |
| 963 | 2722.3608 | 964 | 2725.1895 | 965 | 2728.0178 | 966 | 2730.8462 |
| 967 | 2733.6746 | 968 | 2736.5032 | 969 | 2739.3315 | 970 | 2742.1599 |
| 971 | 2744.9883 | 972 | 2747.8167 | 973 | 2750.6453 | 974 | 2753.4736 |
| 975 | 2756.3020 | 976 | 2759.1304 | 977 | 2761.9590 | 978 | 2764.7874 |
| 979 | 2767.6157 | 980 | 2770.4441 | 981 | 2773.2727 | 982 | 2776.1011 |
| 983 | 2778.9294 | 984 | 2781.7578 | 985 | 2784.5864 | 986 | 2787.4148 |
| 987 | 2790.2432 | 988 | 2793.0715 | 989 | 2795.9001 | 990 | 2798.7285 |
| 991 | 2801.5569 | 992 | 2804.3853 | 993 | 2807.2136 | 994 | 2810.0422 |
| 995 | 2812.8706 | 996 | 2815.6990 | 997 | 2818.5273 | 998 | 2821.3560 |
| 999 | 2824.1843 | 1000 | 2827.0127 | | | | |

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