

Магические квадраты (Часть 3).

В одиночку даже магические квадраты являются одним из трех типов магических квадратов.

Два других типа:

• нечетный (n=3, 5, 7, 9, 11 и т.д.) и

• вдвойне четный (кратный 4, где n=4, 8, 12, 16, 20 и т.д.)

Одиночные даже магические квадраты

Ну, кажется, мы столкнулись с другой фразой, которая не очень описательна. В принципе, «по отдельности четный» означает делимый на 2, но не на четыре. Формула для генерации однозначно четных чисел $(n*4) + 2$, которая генерирует числа 2, 6, 10, 14, 18, 22, 26, 30 и так далее. Не существует магического квадрата, который можно построить в квадрате 2 на 2, но по отдельности даже магические квадраты могут быть построены для n = 6, 10, 14 и так далее.

В одиночку даже магические квадраты являются самыми сложными для построения, и поэтому давайте начнем с наименьшего из возможных, где n = 6.

Чтобы получить сумму, мы будем использовать формулу, которую мы использовали ранее:

$$\text{Sum} = \frac{n \cdot (n^2 + 1)}{2}$$

Итак, сумма для n=6 равна 111.

Первым шагом является разбиение квадрата на четыре меньших квадрата одинакового размера.

Итак, для построения магического квадрата 6 на 6 мы начинаем с четырех квадратов 3 на 3.

Затем мы строим четыре магических квадрата в шаблоне, указанном здесь:

| | |
|---|---|
| A | C |
| D | B |

По сути, это означает, что в разделе «А» мы построим магический квадрат с числами от 1 до 9, в разделе «В» магический квадрат будет начинаться с 10 и заканчиваться 18, раздел «С» будет иметь числа от 19 до 27, а раздел «D» идет от 28 до 36. Итак, когда мы закончим этот шаг, квадрат выглядит следующим образом:

| | | | | | |
|----|----|----|----|----|----|
| 8 | 1 | 6 | 26 | 19 | 24 |
| 3 | 5 | 7 | 21 | 23 | 25 |
| 4 | 9 | 2 | 22 | 27 | 20 |
| 35 | 28 | 33 | 17 | 10 | 15 |
| 30 | 32 | 34 | 12 | 14 | 16 |
| 31 | 36 | 29 | 13 | 18 | 11 |

Ну, вы, наверное, заметили, что шесть чисел в левой части квадрата были выделены красным или синим цветом, и это потому, что на этом магическом квадрате еще предстоит проделать еще некоторую работу.

В этом случае «красные» числа должны быть перемещены туда, где находятся «синие» числа, и наоборот. После этого квадрат должен выглядеть следующим образом:

| | | | | | |
|----|----|----|----|----|----|
| 35 | 1 | 6 | 26 | 19 | 24 |
| 3 | 32 | 7 | 21 | 23 | 25 |
| 31 | 9 | 2 | 22 | 27 | 20 |
| 8 | 28 | 33 | 17 | 10 | 15 |
| 30 | 5 | 34 | 12 | 14 | 16 |
| 4 | 36 | 29 | 13 | 18 | 11 |

Yes, finally we are done and all rows, columns and both diagonals sum to 111.

Next, we'll move on to building a 10 by 10 square. The rules about building four $n + 2$ squares in the "ABCD" pattern still apply but if you notice, in the left side square, the numbers that need shifting make up a different pattern from the 6 by 6 square.

The numbers on the left side that require shifting are one column wider and for the first time we have a right hand column to deal with.

| | | | | | | | | | |
|----|----|-----|----|----|----|----|----|----|----|
| 17 | 24 | 1 | 8 | 15 | 67 | 74 | 51 | 58 | 65 |
| 23 | 5 | 7 | 14 | 16 | 73 | 55 | 57 | 64 | 66 |
| 4 | 6 | 13 | 20 | 22 | 54 | 56 | 63 | 70 | 72 |
| 10 | 12 | 19 | 21 | 3 | 60 | 62 | 69 | 71 | 53 |
| 11 | 18 | 25 | 2 | 9 | 61 | 68 | 75 | 52 | 59 |
| 92 | 99 | 76 | 83 | 90 | 42 | 49 | 26 | 33 | 40 |
| 98 | 80 | 82 | 89 | 91 | 48 | 30 | 32 | 39 | 41 |
| 79 | 81 | 88 | 95 | 97 | 29 | 31 | 38 | 45 | 47 |
| 85 | 87 | 94 | 96 | 78 | 35 | 37 | 44 | 46 | 28 |
| 86 | 93 | 100 | 77 | 84 | 36 | 43 | 50 | 27 | 34 |

| | | | | | | | | | |
|----|----|-----|----|----|----|----|----|----|----|
| 92 | 99 | 1 | 8 | 15 | 67 | 74 | 51 | 58 | 40 |
| 98 | 80 | 7 | 14 | 16 | 73 | 55 | 57 | 64 | 41 |
| 4 | 81 | 88 | 20 | 22 | 54 | 56 | 63 | 70 | 47 |
| 85 | 87 | 19 | 21 | 3 | 60 | 62 | 69 | 71 | 28 |
| 86 | 93 | 25 | 2 | 9 | 61 | 68 | 75 | 52 | 34 |
| 17 | 24 | 76 | 83 | 90 | 42 | 49 | 26 | 33 | 65 |
| 23 | 5 | 82 | 89 | 91 | 48 | 30 | 32 | 39 | 66 |
| 79 | 6 | 13 | 95 | 97 | 29 | 31 | 38 | 45 | 72 |
| 10 | 12 | 94 | 96 | 78 | 35 | 37 | 44 | 46 | 53 |
| 11 | 18 | 100 | 77 | 84 | 36 | 43 | 50 | 27 | 59 |

The square on the right side is the completed square after all those numbers have been shifted and all rows, columns and diagonals sum to 505.

We can see that the pattern for the cells that need to be shifted is now forming a very predictable pattern.

Perhaps by building a 14 by 14 magic square we could see if the pattern continues in the same fashion.

| | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 30 | 39 | 48 | 1 | 10 | 19 | 28 | 128 | 137 | 146 | 99 | 108 | 117 | 126 |
| 38 | 47 | 7 | 9 | 18 | 27 | 29 | 136 | 145 | 105 | 107 | 116 | 125 | 127 |
| 46 | 6 | 8 | 17 | 26 | 35 | 37 | 144 | 104 | 106 | 115 | 124 | 133 | 135 |
| 5 | 14 | 16 | 25 | 34 | 36 | 45 | 103 | 112 | 114 | 123 | 132 | 134 | 143 |
| 13 | 15 | 24 | 33 | 42 | 44 | 4 | 111 | 113 | 122 | 131 | 140 | 142 | 102 |
| 21 | 23 | 32 | 41 | 43 | 3 | 12 | 119 | 121 | 130 | 139 | 141 | 101 | 110 |
| 22 | 31 | 40 | 49 | 2 | 11 | 20 | 120 | 129 | 138 | 147 | 100 | 109 | 118 |
| 177 | 186 | 195 | 148 | 157 | 166 | 175 | 79 | 88 | 97 | 50 | 59 | 68 | 77 |
| 185 | 194 | 154 | 156 | 165 | 174 | 176 | 87 | 96 | 56 | 58 | 67 | 76 | 78 |
| 193 | 153 | 155 | 164 | 173 | 182 | 184 | 95 | 55 | 57 | 66 | 75 | 84 | 86 |
| 152 | 161 | 163 | 172 | 181 | 183 | 192 | 54 | 63 | 65 | 74 | 83 | 85 | 94 |
| 160 | 162 | 171 | 180 | 189 | 191 | 151 | 62 | 64 | 73 | 82 | 91 | 93 | 53 |
| 168 | 170 | 179 | 188 | 190 | 150 | 159 | 70 | 72 | 81 | 90 | 92 | 52 | 61 |
| 169 | 178 | 187 | 196 | 149 | 158 | 167 | 71 | 80 | 89 | 98 | 51 | 60 | 69 |

| | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 177 | 186 | 195 | 1 | 10 | 19 | 28 | 128 | 137 | 146 | 99 | 108 | 68 | 77 |
| 185 | 194 | 154 | 9 | 18 | 27 | 29 | 136 | 145 | 105 | 107 | 116 | 76 | 78 |
| 193 | 153 | 155 | 17 | 26 | 35 | 37 | 144 | 104 | 106 | 115 | 124 | 84 | 86 |
| 5 | 161 | 163 | 172 | 34 | 36 | 45 | 103 | 112 | 114 | 123 | 132 | 85 | 94 |
| 160 | 162 | 171 | 33 | 42 | 44 | 4 | 111 | 113 | 122 | 131 | 140 | 93 | 53 |
| 168 | 170 | 179 | 41 | 43 | 3 | 12 | 119 | 121 | 130 | 139 | 141 | 52 | 61 |
| 169 | 178 | 187 | 49 | 2 | 11 | 20 | 120 | 129 | 138 | 147 | 100 | 60 | 69 |
| 30 | 39 | 48 | 148 | 157 | 166 | 175 | 79 | 88 | 97 | 50 | 59 | 117 | 126 |
| 38 | 47 | 7 | 156 | 165 | 174 | 176 | 87 | 96 | 56 | 58 | 67 | 125 | 127 |
| 46 | 6 | 8 | 164 | 173 | 182 | 184 | 95 | 55 | 57 | 66 | 75 | 133 | 135 |
| 152 | 14 | 16 | 25 | 181 | 183 | 192 | 54 | 63 | 65 | 74 | 83 | 134 | 143 |
| 13 | 15 | 24 | 180 | 189 | 191 | 151 | 62 | 64 | 73 | 82 | 91 | 142 | 102 |
| 21 | 23 | 32 | 188 | 190 | 150 | 159 | 70 | 72 | 81 | 90 | 92 | 101 | 110 |
| 22 | 31 | 40 | 196 | 149 | 158 | 167 | 71 | 80 | 89 | 98 | 51 | 109 | 118 |

Comparing this to the 10 by 10 square, we can see the pattern is now quite simple. The cells that require shifting for the 14 by 14 square are one column greater than the 10 by 10 square. The magic sum for this square is 1,379.

To make absolutely sure that the pattern for the shifted cells remains the same, let's construct a singly even magic square for $n=30$ which will have a magic sum of 13,515. The square after the first step is illustrated here:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 122 | 139 | 156 | 173 | 190 | 207 | 224 | 1 | 18 | 35 | 52 | 69 | 86 | 103 | 120 | 572 | 589 | 606 | 623 | 640 | 657 | 674 | 451 | 468 | 485 | 502 | 519 | 536 | 553 | 570 |
| 138 | 155 | 172 | 189 | 206 | 223 | 15 | 17 | 34 | 51 | 68 | 85 | 102 | 119 | 121 | 588 | 605 | 622 | 639 | 656 | 673 | 465 | 467 | 484 | 501 | 518 | 535 | 552 | 569 | 571 |
| 154 | 171 | 188 | 205 | 222 | 14 | 16 | 33 | 50 | 67 | 84 | 101 | 118 | 135 | 137 | 604 | 621 | 638 | 655 | 672 | 464 | 466 | 483 | 500 | 517 | 534 | 551 | 568 | 585 | 587 |
| 170 | 187 | 204 | 221 | 13 | 30 | 32 | 49 | 66 | 83 | 100 | 117 | 134 | 136 | 153 | 620 | 637 | 654 | 671 | 463 | 480 | 482 | 499 | 516 | 533 | 550 | 567 | 584 | 586 | 603 |
| 186 | 203 | 220 | 12 | 29 | 31 | 48 | 65 | 82 | 99 | 116 | 133 | 150 | 152 | 169 | 636 | 653 | 670 | 462 | 479 | 481 | 498 | 515 | 532 | 549 | 566 | 583 | 600 | 602 | 619 |
| 202 | 219 | 11 | 28 | 45 | 47 | 64 | 81 | 98 | 115 | 132 | 149 | 151 | 168 | 185 | 652 | 669 | 461 | 478 | 495 | 497 | 514 | 531 | 548 | 565 | 582 | 599 | 601 | 618 | 635 |
| 218 | 10 | 27 | 44 | 46 | 63 | 80 | 97 | 114 | 131 | 148 | 165 | 167 | 184 | 201 | 668 | 460 | 477 | 494 | 496 | 513 | 530 | 547 | 564 | 581 | 598 | 615 | 617 | 634 | 651 |
| 9 | 26 | 43 | 60 | 62 | 79 | 96 | 113 | 130 | 147 | 164 | 166 | 183 | 200 | 217 | 459 | 476 | 493 | 510 | 512 | 529 | 546 | 563 | 580 | 597 | 614 | 616 | 633 | 650 | 667 |
| 25 | 42 | 59 | 61 | 78 | 95 | 112 | 129 | 146 | 163 | 180 | 182 | 199 | 216 | 8 | 475 | 492 | 509 | 511 | 528 | 545 | 562 | 579 | 596 | 613 | 630 | 632 | 649 | 666 | 458 |
| 41 | 58 | 75 | 77 | 94 | 111 | 128 | 145 | 162 | 179 | 181 | 198 | 215 | 7 | 24 | 491 | 508 | 525 | 527 | 544 | 561 | 578 | 595 | 612 | 629 | 631 | 648 | 665 | 457 | 474 |
| 57 | 74 | 76 | 93 | 110 | 127 | 144 | 161 | 178 | 195 | 197 | 214 | 6 | 23 | 40 | 507 | 524 | 526 | 543 | 560 | 577 | 594 | 611 | 628 | 645 | 647 | 664 | 456 | 473 | 490 |
| 73 | 90 | 92 | 109 | 126 | 143 | 160 | 177 | 194 | 196 | 213 | 5 | 22 | 39 | 56 | 523 | 540 | 542 | 559 | 576 | 593 | 610 | 627 | 644 | 646 | 663 | 455 | 472 | 489 | 506 |
| 89 | 91 | 108 | 125 | 142 | 159 | 176 | 193 | 210 | 212 | 4 | 21 | 38 | 55 | 72 | 539 | 541 | 558 | 575 | 592 | 609 | 626 | 643 | 660 | 662 | 454 | 471 | 488 | 505 | 522 |
| 105 | 107 | 124 | 141 | 158 | 175 | 192 | 209 | 211 | 3 | 20 | 37 | 54 | 71 | 88 | 555 | 557 | 574 | 591 | 608 | 625 | 642 | 659 | 661 | 453 | 470 | 487 | 504 | 521 | 538 |
| 106 | 123 | 140 | 157 | 174 | 191 | 208 | 225 | 2 | 19 | 36 | 53 | 70 | 87 | 104 | 556 | 573 | 590 | 607 | 624 | 641 | 658 | 675 | 452 | 469 | 486 | 503 | 520 | 537 | 554 |
| 797 | 814 | 831 | 848 | 865 | 882 | 899 | 676 | 693 | 710 | 727 | 744 | 761 | 778 | 795 | 347 | 364 | 381 | 398 | 415 | 432 | 449 | 226 | 243 | 260 | 277 | 294 | 311 | 328 | 345 |
| 813 | 830 | 847 | 864 | 881 | 898 | 690 | 692 | 709 | 726 | 743 | 760 | 777 | 794 | 796 | 363 | 380 | 397 | 414 | 431 | 448 | 240 | 242 | 259 | 276 | 293 | 310 | 327 | 344 | 346 |
| 829 | 846 | 863 | 880 | 897 | 689 | 691 | 708 | 725 | 742 | 759 | 776 | 793 | 810 | 812 | 379 | 396 | 413 | 430 | 447 | 239 | 241 | 258 | 275 | 292 | 309 | 326 | 343 | 360 | 362 |
| 845 | 862 | 879 | 896 | 688 | 705 | 707 | 724 | 741 | 758 | 775 | 792 | 809 | 811 | 828 | 395 | 412 | 429 | 446 | 238 | 255 | 257 | 274 | 291 | 308 | 325 | 342 | 359 | 361 | 378 |
| 861 | 878 | 895 | 687 | 704 | 706 | 723 | 740 | 757 | 774 | 791 | 808 | 825 | 827 | 844 | 411 | 428 | 445 | 237 | 254 | 256 | 273 | 290 | 307 | 324 | 341 | 358 | 375 | 377 | 394 |
| 877 | 894 | 686 | 703 | 720 | 722 | 739 | 756 | 773 | 790 | 807 | 824 | 826 | 843 | 860 | 427 | 444 | 236 | 253 | 270 | 272 | 289 | 306 | 323 | 340 | 357 | 374 | 376 | 393 | 410 |
| 893 | 685 | 702 | 719 | 721 | 738 | 755 | 772 | 789 | 806 | 823 | 840 | 842 | 859 | 876 | 443 | 235 | 252 | 269 | 271 | 288 | 305 | 322 | 339 | 356 | 373 | 390 | 392 | 409 | 426 |
| 684 | 701 | 718 | 735 | 737 | 754 | 771 | 788 | 805 | 822 | 839 | 841 | 858 | 875 | 892 | 234 | 251 | 268 | 285 | 287 | 304 | 321 | 338 | 355 | 372 | 389 | 391 | 408 | 425 | 442 |
| 700 | 717 | 734 | 736 | 753 | 770 | 787 | 804 | 821 | 838 | 855 | 857 | 874 | 891 | 683 | 250 | 267 | 284 | 286 | 303 | 320 | 337 | 354 | 371 | 388 | 405 | 407 | 424 | 441 | 233 |
| 716 | 733 | 750 | 752 | 769 | 786 | 803 | 820 | 837 | 854 | 856 | 873 | 890 | 682 | 699 | 266 | 283 | 300 | 302 | 319 | 336 | 353 | 370 | 387 | 404 | 406 | 423 | 440 | 232 | 249 |
| 732 | 749 | 751 | 768 | 785 | 802 | 819 | 836 | 853 | 870 | 872 | 889 | 681 | 698 | 715 | 282 | 299 | 301 | 318 | 335 | 352 | 369 | 386 | 403 | 420 | 422 | 439 | 231 | 248 | 265 |
| 748 | 765 | 767 | 784 | 801 | 818 | 835 | 852 | 869 | 871 | 888 | 680 | 697 | 714 | 731 | 298 | 315 | 317 | 334 | 351 | 368 | 385 | 402 | 419 | 421 | 438 | 230 | 247 | 264 | 281 |
| 764 | 766 | 783 | 800 | 817 | 834 | 851 | 868 | 885 | 887 | 679 | 696 | 713 | 730 | 747 | 314 | 316 | 333 | 350 | 367 | 384 | 401 | 418 | 435 | 437 | 229 | 246 | 263 | 280 | 297 |
| 780 | 782 | 799 | 816 | 833 | 850 | 867 | 884 | 886 | 678 | 695 | 712 | 729 | 746 | 763 | 330 | 332 | 349 | 366 | 383 | 400 | 417 | 434 | 436 | 228 | 245 | 262 | 279 | 296 | 313 |
| 781 | 798 | 815 | 832 | 849 | 866 | 883 | 900 | 677 | 694 | 711 | 728 | 745 | 762 | 779 | 331 | 348 | 365 | 382 | 399 | 416 | 433 | 450 | 227 | 244 | 261 | 278 | 295 | 312 | 329 |

After shifting the cells, the completed magic square now looks like this:

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 797 | 814 | 831 | 848 | 865 | 882 | 899 | 1 | 18 | 35 | 52 | 69 | 86 | 103 | 120 | 572 | 589 | 606 | 623 | 640 | 657 | 674 | 451 | 468 | 260 | 277 | 294 | 311 | 328 | 345 |
| 813 | 830 | 847 | 864 | 881 | 898 | 690 | 17 | 34 | 51 | 68 | 85 | 102 | 119 | 121 | 588 | 605 | 622 | 639 | 656 | 673 | 465 | 467 | 484 | 276 | 293 | 310 | 327 | 344 | 346 |
| 829 | 846 | 863 | 880 | 897 | 689 | 691 | 33 | 50 | 67 | 84 | 101 | 118 | 135 | 137 | 604 | 621 | 638 | 655 | 672 | 464 | 466 | 483 | 500 | 292 | 309 | 326 | 343 | 360 | 362 |
| 845 | 862 | 879 | 896 | 688 | 705 | 707 | 49 | 66 | 83 | 100 | 117 | 134 | 136 | 153 | 620 | 637 | 654 | 671 | 463 | 480 | 482 | 499 | 516 | 308 | 325 | 342 | 359 | 361 | 378 |
| 861 | 878 | 895 | 687 | 704 | 706 | 723 | 65 | 82 | 99 | 116 | 133 | 150 | 152 | 169 | 636 | 653 | 670 | 462 | 479 | 481 | 498 | 515 | 532 | 324 | 341 | 358 | 375 | 377 | 394 |
| 877 | 894 | 686 | 703 | 720 | 722 | 739 | 81 | 98 | 115 | 132 | 149 | 151 | 168 | 185 | 652 | 669 | 461 | 478 | 495 | 497 | 514 | 531 | 548 | 340 | 357 | 374 | 376 | 393 | 410 |
| 893 | 685 | 702 | 719 | 721 | 738 | 755 | 97 | 114 | 131 | 148 | 165 | 167 | 184 | 201 | 668 | 460 | 477 | 494 | 496 | 513 | 530 | 547 | 564 | 356 | 373 | 390 | 392 | 409 | 426 |
| 9 | 701 | 718 | 735 | 737 | 754 | 771 | 788 | 130 | 147 | 164 | 166 | 183 | 200 | 217 | 459 | 476 | 493 | 510 | 512 | 529 | 546 | 563 | 580 | 372 | 389 | 391 | 408 | 425 | 442 |
| 700 | 717 | 734 | 736 | 753 | 770 | 787 | 129 | 146 | 163 | 180 | 182 | 199 | 216 | 8 | 475 | 492 | 509 | 511 | 528 | 545 | 562 | 579 | 596 | 388 | 405 | 407 | 424 | 441 | 233 |
| 716 | 733 | 750 | 752 | 769 | 786 | 803 | 145 | 162 | 179 | 181 | 198 | 215 | 7 | 24 | 491 | 508 | 525 | 527 | 544 | 561 | 578 | 595 | 612 | 404 | 406 | 423 | 440 | 232 | 249 |
| 732 | 749 | 751 | 768 | 785 | 802 | 819 | 161 | 178 | 195 | 197 | 214 | 6 | 23 | 40 | 507 | 524 | 526 | 543 | 560 | 577 | 594 | 611 | 628 | 420 | 422 | 439 | 231 | 248 | 265 |
| 748 | 765 | 767 | 784 | 801 | 818 | 835 | 177 | 194 | 196 | 213 | 5 | 22 | 39 | 56 | 523 | 540 | 542 | 559 | 576 | 593 | 610 | 627 | 644 | 421 | 438 | 230 | 247 | 264 | 281 |
| 764 | 766 | 783 | 800 | 817 | 834 | 851 | 193 | 210 | 212 | 4 | 21 | 38 | 55 | 72 | 539 | 541 | 558 | 575 | 592 | 609 | 626 | 643 | 660 | 437 | 229 | 246 | 263 | 280 | 297 |
| 780 | 782 | 799 | 816 | 833 | 850 | 867 | 209 | 211 | 3 | 20 | 37 | 54 | 71 | 88 | 555 | 557 | 574 | 591 | 608 | 625 | 642 | 659 | 661 | 228 | 245 | 262 | 279 | 296 | 313 |
| 781 | 798 | 815 | 832 | 849 | 866 | 883 | 225 | 2 | 19 | 36 | 53 | 70 | 87 | 104 | 556 | 573 | 590 | 607 | 624 | 641 | 658 | 675 | 452 | 244 | 261 | 278 | 295 | 312 | 329 |
| 122 | 139 | 156 | 173 | 190 | 207 | 224 | 676 | 693 | 710 | 727 | 744 | 761 | 778 | 795 | 347 | 364 | 381 | 398 | 415 | 432 | 449 | 226 | 243 | 485 | 502 | 519 | 536 | 553 | 570 |
| 138 | 155 | 172 | 189 | 206 | 223 | 15 | 692 | 709 | 726 | 743 | 760 | 777 | 794 | 796 | 363 | 380 | 397 | 414 | 431 | 448 | 240 | 242 | 259 | 501 | 518 | 535 | 552 | 569 | 571 |
| 154 | 171 | 188 | 205 | 222 | 14 | 16 | 708 | 725 | 742 | 759 | 776 | 793 | 810 | 812 | 379 | 396 | 413 | 430 | 447 | 239 | 241 | 258 | 275 | 517 | 534 | 551 | 568 | 585 | 587 |
| 170 | 187 | 204 | 221 | 13 | 30 | 32 | 724 | 741 | 758 | 775 | 792 | 809 | 811 | 828 | 395 | 412 | 429 | 446 | 238 | 255 | 257 | 274 | 291 | 533 | 550 | 567 | 584 | 586 | 603 |
| 186 | 203 | 220 | 12 | 29 | 31 | 48 | 740 | 757 | 774 | 791 | 808 | 825 | 827 | 844 | 411 | 428 | 445 | 237 | 254 | 256 | 273 | 290 | 307 | 549 | 566 | 583 | 600 | 602 | 619 |
| 202 | 219 | 11 | 28 | 45 | 47 | 64 | 756 | 773 | 790 | 807 | 824 | 826 | 843 | 860 | 427 | 444 | 236 | 253 | 270 | 272 | 289 | 306 | 323 | 565 | 582 | 599 | 601 | 618 | 635 |
| 218 | 10 | 27 | 44 | 46 | 63 | 80 | 772 | 789 | 806 | 823 | 840 | 842 | 859 | 876 | 443 | 235 | 252 | 269 | 271 | 288 | 305 | 322 | 339 | 581 | 598 | 615 | 617 | 634 | 651 |
| 684 | 26 | 43 | 60 | 62 | 79 | 96 | 113 | 805 | 822 | 839 | 841 | 858 | 875 | 892 | 234 | 251 | 268 | 285 | 287 | 304 | 321 | 338 | 355 | 597 | 614 | 616 | 633 | 650 | 667 |
| 25 | 42 | 59 | 61 | 78 | 95 | 112 | 804 | 821 | 838 | 855 | 857 | 874 | 891 | 683 | 250 | 267 | 284 | 286 | 303 | 320 | 337 | 354 | 371 | 613 | 630 | 632 | 649 | 666 | 458 |
| 41 | 58 | 75 | 77 | 94 | 111 | 128 | 820 | 837 | 854 | 856 | 873 | 890 | 682 | 699 | 266 | 283 | 300 | 302 | 319 | 336 | 353 | 370 | 387 | 629 | 631 | 648 | 665 | 457 | 474 |
| 57 | 74 | 76 | 93 | 110 | 127 | 144 | 836 | 853 | 870 | 872 | 889 | 681 | 698 | 715 | 282 | 299 | 301 | 318 | 335 | 352 | 369 | 386 | 403 | 645 | 647 | 664 | 456 | 473 | 490 |
| 73 | 90 | 92 | 109 | 126 | 143 | 160 | 852 | 869 | 871 | 888 | 680 | 697 | 714 | 731 | 298 | 315 | 317 | 334 | 351 | 368 | 385 | 402 | 419 | 646 | 663 | 455 | 472 | 489 | 506 |
| 89 | 91 | 108 | 125 | 142 | 159 | 176 | 868 | 885 | 887 | 679 | 696 | 713 | 730 | 747 | 314 | 316 | 333 | 350 | 367 | 384 | 401 | 418 | 435 | 662 | 454 | 471 | 488 | 505 | 522 |
| 105 | 107 | 124 | 141 | 158 | 175 | 192 | 884 | 886 | 678 | 695 | 712 | 729 | 746 | 763 | 330 | 332 | 349 | 366 | 383 | 400 | 417 | 434 | 436 | 453 | 470 | 487 | 504 | 521 | 538 |
| 106 | 123 | 140 | 157 | 174 | 191 | 208 | 900 | 677 | 694 | 711 | 728 | 745 | 762 | 779 | 331 | 348 | 365 | 382 | 399 | 416 | 433 | 450 | 227 | 469 | 486 | 503 | 520 | 537 | 554 |

To help you identify the shifted cells, we have highlighted these in color in the "before" and "after" graphics.
Now that you are very sure of how to construct singly even magic squares, you can go on to create ones for n=26, n=34 or a great many other sizes.

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