

**GOLD SPIKE**

*Deluxe*

# SUDOKU

## INSTRUCTION BOOK

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 5 |   | 2 |   |   |   |   | 6 |   |
|   |   |   | 9 | 5 | 4 |   |   | 7 |
| 9 |   |   |   | 3 |   | 1 |   |   |
|   |   |   | 5 |   |   | 7 |   |   |
| 1 |   |   |   |   |   |   |   | 5 |
|   |   | 4 |   |   | 6 |   |   |   |
|   |   | 5 |   | 7 |   |   |   | 6 |
| 6 |   |   | 4 | 2 | 1 |   |   |   |
|   | 9 |   |   |   |   | 2 |   | 1 |

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We especially thank Angus Johnson, who created the Simple Sudoku™ software for Windows, and who provided all of the puzzles in this booklet.

Simple Sudoku™ makes high quality puzzles that are symmetrical, have a single solution, and do not require trial and error to solve. The user can also choose between five levels of complexity - from Easy to Extreme. Each puzzle is generated randomly so there is an almost limitless selection.

To find out more about Simple Sudoku™, and for an excellent step-by-step guide to solving Sudoku, visit:

<http://angusj.com/sudoku/>

Gold Spike™ Sudoku was designed by George TerBush and James TerBush.

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|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 8 |   |   | 4 |
|   | 8 | 4 |   | 1 | 6 |   |   |   |
|   |   |   | 5 |   |   | 1 |   |   |
| 1 |   | 3 | 8 |   |   | 9 |   |   |
| 6 |   | 8 |   |   |   | 4 |   | 3 |
|   |   | 2 |   |   | 9 | 5 |   | 1 |
|   |   | 7 |   |   | 2 |   |   |   |
|   |   |   | 7 | 8 |   | 2 | 6 |   |
| 2 |   |   | 3 |   |   |   |   |   |

## How to Play

Sudoku is a number game that requires no arithmetic - just logical thinking and the process of elimination. The game is played on a grid consisting of 9 rows, 9 columns, and 9 blocks. Each row, column, and block contains 9 squares.

Some of the squares contain numbers, which are the “givens.” The object is to fill the empty squares so that each row, column, and block contains all the numbers from 1 to 9. No number can appear in any row, column, or block more than once.

The wooden game pieces have numbers on both sides. Use the white numbers for the “givens” and the black numbers for the ones that you place in the empty squares.

The best way to solve Sudoku is to only put a number in a square when you are certain it goes there. **Don’t guess!** If your guess is wrong, you may not discover it until you try to place the last number on the grid.

By using a few simple techniques, you’ll be ready to start solving Sudoku. The first step is known as “scanning.”

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 8 |   |   | 4 |
|   | 8 | 4 |   | 1 | 6 |   |   |   |
|   |   |   | 5 |   |   | 1 |   |   |
| 1 |   | 3 | 8 |   |   | 9 |   |   |
| 6 |   | 8 |   |   |   | 4 |   | 3 |
|   |   | 2 |   |   | 9 | 5 | 8 | 1 |
| 8 |   | 7 |   |   | 2 |   |   |   |
|   |   |   | 7 | 8 |   | 2 | 6 |   |
| 2 |   |   | 3 |   |   |   |   |   |

**Scanning** makes use of the rule that a number can only appear in a row or column once. By scanning the rows and columns, it will show where certain numbers cannot go, and may reveal the one square within a block where a certain number can go.

You can begin scanning for any number, but it's better to start with numbers based on their frequency. Since there are five 8s in the example above, we'll start by trying to fill more 8s.

Rows 4 and 5 already have 8s, which leaves one square in the middle-right block to put the 8.

Columns 2 and 3 already have 8s, which leaves two squares in the lower-left block. However, there is already an 8 in row 8, which leaves one square in the lower-left block to put the 8.

Finding numbers will often help find more numbers. Rows 1 and 2 already have 8s, and we placed an 8 in column 8, which leaves one square in the upper-right block to put the 8.

If you cannot find more numbers to place, thoroughly scan for every missing number in each block.

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 8 |   |   | 4 |
|   | 8 | 4 |   | 1 | 6 |   |   |   |
|   |   |   | 5 |   |   | 1 |   | 8 |
| 1 |   | 3 | 8 |   |   | 9 |   |   |
| 6 |   | 8 |   |   |   | 4 |   | 3 |
|   |   | 2 |   |   | 9 | 5 | 8 | 1 |
| 8 |   | 7 |   |   | 2 |   |   |   |
|   |   |   | 7 | 8 |   | 2 | 6 |   |
| 2 |   |   | 3 |   |   | 8 |   |   |

While scanning, if you find a row, column, or block that is missing only a few numbers, it's a good idea to identify those missing numbers and see if any of them can be placed.

For example, column 7 is missing 3 6 7. We cannot put the 6 in the bottom square because the lower-right block already has a 6, and we cannot put the 7 there because row 7 already has a 7, so the bottom square must be the 3.

The 6 cannot go in the middle square of column 7 because row 2 already has a 6, so the middle square must be the 7, which makes the top square the 6.

Remember, finding numbers will often help you find more numbers, even in blocks that you have already scanned.

At this point, you may want to try to solve one of the easy puzzles in this booklet.

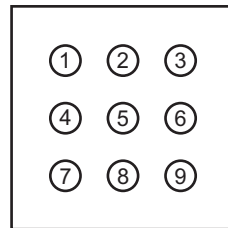
Scanning will solve most easy puzzles, but when it stops yielding results, it's time to begin "marking up."

|                   |                       |                   |                     |                     |                   |   |                     |                   |
|-------------------|-----------------------|-------------------|---------------------|---------------------|-------------------|---|---------------------|-------------------|
| <sup>3</sup><br>5 | <sup>1 2 3</sup><br>7 | <sup>1</sup><br>5 | <sup>2</sup><br>9   | <sup>2</sup><br>7   | 8                 | 6 | <sup>2 3</sup><br>5 | 4                 |
| <sup>3</sup><br>5 | 8                     | 4                 | <sup>2</sup><br>9   | 1                   | 6                 | 7 | <sup>2 3</sup><br>5 | <sup>2</sup><br>5 |
| <sup>7</sup><br>9 | <sup>2</sup><br>6     | <sup>6</sup><br>9 | 5                   | 4                   | 3                 | 1 | <sup>2</sup><br>9   | 8                 |
| 1                 | 5                     | 3                 | 8                   | <sup>2</sup><br>7   | 4                 | 9 | <sup>2</sup><br>7   | 6                 |
| 6                 | 9                     | 8                 | <sup>1 2</sup><br>7 | <sup>2</sup><br>5   | <sup>1</sup><br>5 | 4 | <sup>2</sup><br>7   | 3                 |
| <sup>4</sup><br>7 | <sup>4</sup><br>7     | 2                 | 6                   | 3                   | 9                 | 5 | 8                   | 1                 |
| 8                 | <sup>1</sup><br>6     | 7                 | 4                   | <sup>5 6</sup><br>9 | 2                 | 3 | <sup>1</sup><br>5   | <sup>5</sup><br>9 |
| <sup>4</sup><br>5 | <sup>3</sup><br>4     | <sup>1</sup><br>5 | 7                   | 8                   | <sup>1</sup><br>5 | 2 | 6                   | <sup>5</sup><br>9 |
| 2                 | <sup>1</sup><br>4     | <sup>1</sup><br>5 | 3                   | <sup>5 6</sup><br>9 | <sup>1</sup><br>5 | 8 | <sup>1</sup><br>4   | <sup>5</sup><br>7 |

**Marking up** is a way to keep track of the potential numbers for each empty square. To find the potential numbers, which are known as “candidates”, scan each square’s row, column, and block for all of its missing numbers.

Gold Spike™ Sudoku has a unique method of keeping track of candidate numbers. Pegs are placed in holes to represent the numbers 1 to 9.

If a peg is placed in the upper-left hole, it represents the 1. If a peg is placed in the lower-right hole, it represents the 9.



This method of tracking candidates is very easy to learn, and will help you to recognize patterns of candidate numbers.

Once the candidates are known, we can use solving techniques to reduce them to a single number in each of the squares.

In order for the solving techniques to work, it's essential to keep the candidate numbers updated. Whenever a number is placed in a square, you must remove all pegs representing that number from the square's row, column, and block.

Here are the basic solving techniques for Sudoku:

**Singles**

If a square has only one candidate, put that number into the square.

|   |                             |   |
|---|-----------------------------|---|
| 6 | 5 <sup>3</sup> <sub>9</sub> | 4 |
| 7 | 5 <sup>3</sup> <sub>9</sub> | 2 |
| 1 | <sub>9</sub>                | 8 |

**Hidden Singles**

If a candidate appears just once in a row, column, or block, put that number into the square. In this example, 4 is the hidden single within the block.

|                |                               |   |
|----------------|-------------------------------|---|
| 2 <sub>9</sub> | 2 <sub>7 9</sub>              | 8 |
| 2 <sub>9</sub> | 1                             | 6 |
| 5              | 4 <sup>2</sup> <sub>7 9</sub> | 3 |

**Locked Candidates (in a Block)**

If a candidate within a block only appears in one row or column, remove that candidate from the remaining squares in that row or column outside of the block.

In the example below, the right block has the candidate 9 only in its top row. One of these two squares in the right block must be the 9. Therefore, we will remove candidate 9 from the top row of the other two blocks shown.

|                |                  |                |                    |                  |       |       |                    |                |                  |                  |
|----------------|------------------|----------------|--------------------|------------------|-------|-------|--------------------|----------------|------------------|------------------|
| 3 <sub>8</sub> | 1 <sub>7</sub>   | 3 <sub>9</sub> | 1 <sub>7 8 9</sub> | 6 <sub>8 9</sub> | 5     | 4     | 3 <sub>7 8 9</sub> | 2 <sub>8</sub> | 2 <sub>8 9</sub> | 6 <sub>8 9</sub> |
| 5              | 6 <sub>7 9</sub> | 4              | 2                  | 7 8 9            | 7 8 9 | 7 8 9 | 6 <sub>8</sub>     | 1              | 3                |                  |
| 3 <sub>8</sub> | 2                | 8 9            | 1                  | 3 <sub>8 9</sub> | 6     | 7     | 5                  | 4              |                  |                  |

## Locked Candidates (in a Row or Column)

If a candidate within a row or column only appears in one block, remove that candidate from the remaining squares in that block.

In the example below, the bottom row has the candidate 5 only in the right block. One of these two squares in the bottom row must be the 5. Therefore, we will remove candidate 5 from the top row of the right block.

|                       |                       |                     |                |                     |                   |                   |                       |                       |
|-----------------------|-----------------------|---------------------|----------------|---------------------|-------------------|-------------------|-----------------------|-----------------------|
| <sup>2 3</sup><br>4 5 | <sup>1 2 3</sup><br>4 | 6                   | 7              | 9                   | <sup>1</sup><br>5 | 8                 | <sup>1 3</sup><br>5   | <sup>1 3</sup><br>4 5 |
| <sup>2</sup><br>4 5   | 8                     | <sup>1 2</sup><br>5 | 3              | <sup>1 2</sup><br>5 | 6                 | <sup>2</sup><br>4 | 7                     | 9                     |
| 7                     | <sup>1 2 3</sup>      | 9                   | <sup>1 2</sup> | 4                   | 8                 | <sup>2 3</sup>    | <sup>1 3</sup><br>5 6 | <sup>1 3</sup><br>5 6 |

## Naked Pairs

If two squares in a row, column, or block contain an identical pair of candidates and only those two candidates, remove those candidates from the remaining squares in that row, column, or block.

In this example, the candidates 3 9 in the right column form a naked pair within the block.

|                          |                       |                   |
|--------------------------|-----------------------|-------------------|
| 4                        | <sup>2 3</sup><br>8 9 | 3<br>9            |
| <sup>2 3</sup><br>8<br>6 | 1                     | <sup>3</sup><br>9 |
| 7                        | <sup>2 6</sup><br>8   | 5                 |

One of the two squares in the right column must be the 3 and the other must be the 9. Therefore, we will remove candidate 3 from the square in the left column, and remove candidates 3 9 from the square in the middle column.



# Naked Triples

If three squares in a row, column, or block contain only three different candidates between them, remove those candidates from the remaining squares in that row, column, or block.

In the example below, a triple is formed by the three squares in columns 4, 8 and 9 of the row since they only contain the candidates 1 5 6. Therefore, we will remove candidates 1 6 from columns 1, 3, and 5, which instantly solves the square in column 5.

|        |             |          |        |             |        |        |   |          |          |             |        |
|--------|-------------|----------|--------|-------------|--------|--------|---|----------|----------|-------------|--------|
| 1<br>4 | 3<br>6<br>9 | <b>2</b> | 1<br>4 | 3<br>6<br>9 | 1<br>6 | 1<br>4 | 6 | <b>8</b> | <b>7</b> | 1<br>5<br>6 | 1<br>5 |
|--------|-------------|----------|--------|-------------|--------|--------|---|----------|----------|-------------|--------|

It's important to note that each of the squares which form a naked triple don't have to contain all three candidates. In fact, none of the squares need to have three candidates.

In this example, the candidates 1 3 6 in the left column form a naked triple within the block.

|        |                  |             |
|--------|------------------|-------------|
| 1<br>6 | <b>8</b>         | <b>7</b>    |
| 1<br>3 | 1<br>2<br>5<br>9 | <b>4</b>    |
| 3<br>6 | 2<br>5<br>9      | 2<br>3<br>6 |

Therefore, we will remove candidate 1 from the middle column, and remove candidates 3 6 from the right column, which instantly solves the square in the right column.

So, the squares which form a naked triple may contain only two or three candidates each, but what is important is they contain only three different candidates between them.

Naked triples are rather easy to spot and can often help you solve a difficult puzzle.

## Naked Quads

If four squares in a row, column, or block contain only four different candidates between them, remove those candidates from the remaining squares in that row, column, or block.

In the example below, a quad is formed by the four squares in columns 1, 4, 6, and 9 of the row since they only contain the candidates 6 7 8 9. Therefore, we will remove candidates 6 8 from column 2, and remove candidates 6 7 from column 7.

|   |   |     |   |     |   |     |     |   |   |
|---|---|-----|---|-----|---|-----|-----|---|---|
| 7 | 6 | 2 3 | 5 |     | 1 | 7 8 | 2 3 | 4 | 6 |
| 9 | 8 | 6   |   | 8 9 |   | 6   | 6   |   | 8 |

Each of the squares which form a naked quad don't have to contain all four candidates. In fact, none of the squares need to have four candidates.

## Hidden Pairs

If two squares in a row, column, or block contain an identical pair of candidates that are not found in any other square in that row, column, or block, remove any other candidates from those two squares.

Let's look at the previous example again. The candidates 2 3 in columns 2 and 7 form a hidden pair within the row.

|   |   |     |   |     |   |     |     |   |   |
|---|---|-----|---|-----|---|-----|-----|---|---|
| 7 | 6 | 2 3 | 5 |     | 1 | 7 8 | 2 3 | 4 | 6 |
| 9 | 8 | 6   |   | 8 9 |   | 6   | 6   |   | 8 |

One of the two squares must be the 2 and the other must be the 3. Therefore, we will remove candidates 6 8 from the square in column 2, and remove candidates 6 7 from the square in column 7.

**1**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 8 |   |   | 4 |
|   | 8 | 4 |   | 1 | 6 |   |   |   |
|   |   |   | 5 |   |   | 1 |   |   |
| 1 |   | 3 | 8 |   |   | 9 |   |   |
| 6 |   | 8 |   |   |   | 4 |   | 3 |
|   |   | 2 |   |   | 9 | 5 |   | 1 |
|   |   | 7 |   |   | 2 |   |   |   |
|   |   |   | 7 | 8 |   | 2 | 6 |   |
| 2 |   |   | 3 |   |   |   |   |   |

Easy

**2**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 |   | 9 |   |   | 5 | 4 |   |   |
|   |   | 2 |   |   | 8 |   | 6 |   |
|   | 5 |   |   | 7 |   | 9 |   | 2 |
| 3 | 4 | 1 |   |   |   |   |   |   |
|   | 9 |   |   | 5 |   |   | 4 |   |
|   |   |   |   |   |   | 3 | 2 | 9 |
| 1 |   | 6 |   | 3 |   |   | 7 |   |
|   | 3 |   | 4 |   |   | 8 |   |   |
|   |   | 4 | 8 |   |   | 5 |   | 3 |

Easy

**3**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 8 |   | 4 | 3 |   | 9 |   |   |
|   | 3 |   |   |   |   |   |   |   |
| 2 |   |   |   | 7 | 5 | 6 |   |   |
|   |   |   | 2 |   |   | 5 | 3 |   |
|   |   | 4 |   |   |   | 7 |   |   |
|   | 6 | 3 |   |   | 4 |   |   |   |
|   |   | 6 | 1 | 8 |   |   |   | 5 |
|   |   |   |   |   |   |   | 8 |   |
|   |   | 1 |   | 5 | 9 |   | 7 |   |

Easy

**4**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 7 |   | 1 |   |   |   |   | 3 |
| 9 | 8 |   | 4 |   | 2 |   |   | 6 |
|   |   |   |   | 6 |   |   |   |   |
|   | 6 |   |   |   |   | 8 |   |   |
|   |   | 3 |   | 4 |   | 9 |   |   |
|   |   | 9 |   |   |   |   | 3 |   |
|   |   |   |   | 7 |   |   |   |   |
| 5 |   |   | 6 |   | 3 |   | 1 | 7 |
| 3 |   |   |   |   | 1 |   | 8 | 5 |

Easy

**5**

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   |   |   | 4 |  | 5 |   | 2 | 1 |
|   |   | 5 | 2 |  |   |   | 4 | 7 |
|   |   |   | 8 |  |   |   | 9 |   |
|   | 7 |   |   |  | 1 |   | 3 | 5 |
|   |   |   |   |  |   |   |   |   |
| 1 | 8 |   | 6 |  |   |   | 7 |   |
|   | 5 |   |   |  | 2 |   |   |   |
| 8 | 2 |   |   |  | 7 | 3 |   |   |
| 4 | 1 |   | 5 |  | 8 |   |   |   |

Easy

**6**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 |   |   |   |   |   |   |   |
| 2 |   | 7 |   |   | 5 |   |   |   |
| 6 |   | 3 | 2 |   |   | 8 |   |   |
|   |   |   | 8 |   | 2 |   | 5 |   |
| 8 | 2 |   |   | 1 |   |   | 7 | 9 |
|   | 7 |   | 3 |   | 9 |   |   |   |
|   |   | 2 |   |   | 8 | 7 |   | 6 |
|   |   |   | 4 |   |   | 5 |   | 2 |
|   |   |   |   |   |   |   | 4 | 1 |

Easy

**7**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   | 5 |   |   | 1 | 9 |   |
|   | 6 | 1 |   | 4 |   | 8 | 5 |   |
|   |   |   |   | 8 |   |   |   | 3 |
|   | 2 |   |   |   |   |   | 7 | 5 |
| 6 |   |   | 7 |   | 4 |   |   | 9 |
| 9 | 7 |   |   |   |   |   | 1 |   |
| 3 |   |   |   | 6 |   |   |   |   |
|   | 9 | 7 |   | 1 |   | 3 | 4 |   |
|   | 5 | 6 |   |   | 3 |   |   |   |

Easy

**8**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   | 5 |   |   |   | 4 |
|   |   |   | 4 | 2 |   | 9 |   |   |
|   | 5 |   |   |   | 7 |   |   | 8 |
|   |   | 5 | 1 |   |   | 8 |   | 7 |
| 1 |   | 2 | 8 | 7 | 5 | 4 |   | 6 |
| 7 |   | 8 |   |   | 9 | 5 |   |   |
| 9 |   |   | 7 |   |   |   | 4 |   |
|   |   | 7 |   | 3 | 4 |   |   |   |
| 4 |   |   |   | 8 |   |   |   |   |

Easy

**9**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 7 | 6 |   | 5 |   |   |   |
|   | 1 |   |   | 4 | 9 |   |   | 6 |
|   |   |   |   |   |   |   |   |   |
|   | 9 | 8 |   | 7 |   |   |   |   |
| 7 | 5 | 2 |   |   |   | 3 | 9 | 8 |
|   |   |   |   | 8 |   | 1 | 7 |   |
|   |   |   |   |   |   |   |   |   |
| 6 |   |   | 3 | 5 |   |   | 2 |   |
|   |   |   | 8 |   | 7 | 5 | 4 | 1 |

Easy

**10**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 9 |   |   | 2 |   |   |   |
|   |   |   |   | 1 |   |   |   |   |
|   | 4 |   |   |   | 5 | 7 |   |   |
|   |   |   | 4 | 2 | 6 | 1 |   |   |
| 9 |   |   |   | 7 |   |   |   | 5 |
|   |   | 4 | 5 | 9 | 8 |   |   |   |
|   |   | 8 | 9 |   |   |   | 6 |   |
|   |   |   |   | 5 |   |   |   |   |
|   |   |   | 6 |   |   | 5 | 2 | 1 |

Easy

**11**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 |   |   |   | 5 |   | 2 |   | 4 |
|   |   |   |   |   |   |   | 9 |   |
|   |   |   | 6 |   |   |   | 7 | 5 |
| 6 | 2 |   | 9 |   |   | 4 | 8 |   |
|   |   |   |   | 2 |   |   |   |   |
|   | 7 | 8 |   |   | 4 |   | 2 | 6 |
| 1 | 6 |   |   |   | 5 |   |   |   |
|   | 9 |   |   |   |   |   |   |   |
| 4 |   | 2 |   | 1 |   |   |   | 9 |

Standard

**12**

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   |   | 2 |   |  |   |   |   |   |
|   | 5 |   |   |  | 7 |   | 1 |   |
|   | 7 | 3 | 2 |  | 9 | 8 |   |   |
|   |   | 8 |   |  | 5 |   |   | 2 |
|   |   | 6 | 4 |  | 1 | 9 |   |   |
| 2 |   |   | 9 |  |   | 7 |   |   |
|   |   | 1 | 7 |  | 3 | 5 | 8 |   |
|   | 9 |   | 1 |  |   |   | 2 |   |
|   |   |   |   |  |   | 6 |   |   |

Standard



**13**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 |   | 3 | 7 | 5 |   |   |   |   |
|   |   | 9 | 8 |   | 4 |   |   | 3 |
|   |   |   |   |   |   |   |   | 4 |
| 7 |   |   | 3 |   |   | 6 | 1 |   |
|   |   | 4 | 1 |   | 2 | 3 |   |   |
|   | 9 | 1 |   |   | 5 |   |   | 2 |
| 5 |   |   |   |   |   |   |   |   |
| 1 |   |   | 4 |   | 6 | 2 |   |   |
|   |   |   |   | 1 | 3 | 7 |   | 8 |

Standard

**14**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 4 | 3 |   | 9 |   |   | 6 |   |
|   |   |   | 7 |   | 5 |   |   | 3 |
| 7 |   | 8 |   | 3 |   |   |   |   |
| 9 |   | 7 |   |   |   |   | 2 |   |
|   |   |   | 2 | 7 | 6 |   |   |   |
|   | 2 |   |   |   |   | 3 |   | 4 |
|   |   |   |   | 2 |   | 1 |   | 6 |
| 6 |   |   | 9 |   | 1 |   |   |   |
|   | 7 |   |   | 8 |   | 2 | 9 |   |

Standard

**15**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   | 1 |   |   | 9 |   |   |
|   | 2 | 9 | 8 | 4 |   | 3 |   |   |
|   |   |   |   |   | 6 |   |   |   |
| 9 | 8 | 7 |   | 2 |   | 4 |   |   |
|   | 5 |   |   | 1 |   |   | 2 |   |
|   |   | 2 |   | 9 |   | 7 | 5 | 6 |
|   |   |   | 5 |   |   |   |   |   |
|   |   | 6 |   | 8 | 4 | 2 | 7 |   |
|   |   | 3 |   |   | 1 |   |   |   |

Standard

**16**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   |   |   |   | 2 |   |   |
| 2 |   |   | 1 | 5 |   |   |   |   |
|   |   | 8 |   | 6 |   | 5 |   |   |
| 4 |   |   |   |   | 6 |   |   | 2 |
|   |   | 1 | 5 |   | 3 | 9 |   |   |
| 5 |   |   | 9 |   |   |   |   | 4 |
|   |   | 3 |   | 1 |   | 4 |   |   |
|   |   |   |   | 9 | 4 |   |   | 8 |
|   |   | 2 |   |   |   |   | 6 |   |

Standard

**17**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 |   |   |   |   | 3 |   |   |   |
|   |   | 3 |   | 8 |   |   | 9 |   |
| 7 | 5 |   |   |   |   | 6 | 8 |   |
|   |   |   |   | 7 | 9 | 5 | 2 |   |
| 2 | 7 |   |   |   |   |   | 1 | 8 |
|   | 4 | 5 | 2 | 1 |   |   |   |   |
|   | 3 | 7 |   |   |   |   | 4 | 2 |
|   | 2 |   |   | 4 |   | 7 |   |   |
|   |   |   | 3 |   |   |   |   | 1 |

Standard

**18**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   | 3 |   |   |   |   | 4 |
|   |   |   |   |   | 1 |   | 2 | 9 |
|   |   |   |   |   | 5 |   | 1 |   |
| 9 |   | 7 | 1 | 3 |   |   |   |   |
|   |   | 6 |   | 2 |   | 1 |   |   |
|   |   |   |   | 5 | 9 | 8 |   | 6 |
|   | 2 |   | 8 |   |   |   |   |   |
| 6 | 1 |   | 5 |   |   |   |   |   |
| 5 |   |   |   |   | 3 |   | 8 |   |

Standard

**19**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   | 8 | 7 | 9 | 3 |   |   |
| 3 |   |   |   |   | 5 |   | 4 |   |
|   |   |   |   |   |   |   | 1 |   |
|   |   |   |   |   | 3 | 5 | 8 |   |
| 8 |   |   |   | 6 |   |   |   | 2 |
|   | 9 | 7 | 5 |   |   |   |   |   |
|   | 8 |   |   |   |   |   |   |   |
|   | 2 |   | 7 |   |   |   |   | 9 |
|   |   | 9 | 2 | 4 | 6 |   | 5 |   |

Standard

**20**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 4 |   |   |   |   | 1 |   |   |
|   |   |   | 7 |   |   | 6 |   | 8 |
| 1 |   |   |   |   | 3 | 2 |   |   |
| 4 |   |   |   | 9 |   |   | 3 |   |
| 8 |   |   | 4 |   | 7 |   |   | 1 |
|   | 9 |   |   | 1 |   |   |   | 4 |
|   |   | 4 | 9 |   |   |   |   | 5 |
| 2 |   | 8 |   |   | 5 |   |   |   |
|   |   | 7 |   |   |   |   | 2 |   |

Standard

**21**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 4 |   | 9 |   |   |   |   | 1 |
|   |   | 3 |   |   |   | 9 |   |   |
|   |   |   | 6 | 3 |   | 8 |   | 4 |
|   |   |   | 2 |   |   |   |   | 5 |
| 8 |   |   |   | 5 |   |   |   | 7 |
| 1 |   |   |   |   | 7 |   |   |   |
| 3 |   | 5 |   | 8 | 9 |   |   |   |
|   |   | 4 |   |   |   | 1 |   |   |
| 7 |   |   |   |   | 6 |   | 2 | 9 |

Standard

**22**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 |   |   | 7 |   |   |   |   |   |
|   | 1 |   |   | 4 | 5 |   |   |   |
|   |   |   |   | 9 |   | 4 | 3 |   |
|   |   | 8 | 6 |   |   | 9 |   | 7 |
|   |   | 7 |   | 2 |   | 6 |   |   |
| 9 |   | 6 |   |   | 7 | 5 |   |   |
|   | 7 | 2 |   | 5 |   |   |   |   |
|   |   |   | 8 | 1 |   |   | 5 |   |
|   |   |   |   |   | 6 |   |   | 2 |

Standard

**23**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 9 |   | 2 |   |   |   | 6 |
|   |   | 3 | 6 |   |   | 2 |   | 8 |
|   |   |   |   |   |   | 5 | 4 |   |
|   | 3 |   | 8 |   |   |   |   | 5 |
|   |   | 6 | 3 |   | 9 | 4 |   |   |
| 2 |   |   |   |   | 5 |   | 8 |   |
|   | 9 | 1 |   |   |   |   |   |   |
| 3 |   | 2 |   |   | 6 | 8 |   |   |
| 8 |   |   |   | 3 |   | 7 |   |   |

Standard

**24**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 8 | 9 |   | 6 |   | 1 |   |   |
|   | 7 |   |   |   | 2 | 5 |   | 6 |
| 6 |   | 4 | 3 |   |   |   | 9 |   |
|   | 6 | 5 |   |   | 9 |   |   |   |
|   |   |   |   |   |   |   |   |   |
|   |   |   | 5 |   |   | 6 | 1 |   |
|   | 2 |   |   |   | 6 | 9 |   | 1 |
| 5 |   | 3 | 9 |   |   |   | 6 |   |
|   |   | 6 |   | 3 |   | 7 | 5 |   |

Standard

**25**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 |   |   | 8 | 9 |   |   | 2 |
|   |   |   |   |   |   |   |   |   |
|   | 9 |   |   | 5 |   | 8 | 4 |   |
|   | 1 |   |   |   | 6 |   | 2 |   |
| 9 | 2 | 3 |   |   |   | 6 | 7 | 4 |
|   | 8 |   | 7 |   |   |   | 9 |   |
|   | 4 | 2 |   | 9 |   |   | 8 |   |
|   |   |   |   |   |   |   |   |   |
| 5 |   |   | 8 | 7 |   |   | 1 | 3 |

Standard

**26**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 |   | 7 |   |   | 4 |   | 3 |   |
|   | 5 |   | 3 |   | 1 |   |   |   |
|   | 3 |   |   |   | 6 |   |   | 5 |
| 5 | 7 |   |   |   |   | 8 |   |   |
|   |   | 1 |   | 6 |   | 5 |   |   |
|   |   | 9 |   |   |   |   | 2 | 7 |
| 2 |   |   | 7 |   |   |   | 6 |   |
|   |   |   | 4 |   | 5 |   | 7 |   |
|   | 8 |   | 6 |   |   | 3 |   | 9 |

Standard

**27**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   | 1 |   | 9 |   | 4 | 3 |
|   |   |   |   |   |   | 1 | 9 |   |
|   | 3 |   |   | 5 |   |   |   |   |
| 5 |   |   | 7 | 1 |   | 6 | 8 |   |
|   |   |   |   |   |   |   |   |   |
|   | 1 | 7 |   | 8 | 6 |   |   | 9 |
|   |   |   |   | 7 |   |   | 6 |   |
|   | 7 | 3 |   |   |   |   |   |   |
| 4 | 8 |   | 9 |   | 5 |   | 7 |   |

Standard

**28**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   |   |   | 9 |   |
|   | 2 |   |   | 8 |   |   |   | 3 |
| 3 |   | 1 | 6 |   |   | 2 |   | 7 |
| 4 |   |   |   |   | 6 | 7 |   |   |
|   | 1 |   | 7 |   | 8 |   | 3 |   |
|   |   | 7 | 4 |   |   |   |   | 8 |
| 8 |   | 4 |   |   | 5 | 3 |   | 6 |
| 5 |   |   |   | 7 |   |   | 2 |   |
|   | 9 |   |   |   |   |   |   |   |

Standard



**29**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 |   |   |   | 6 | 4 |   |   | 3 |
| 4 | 2 |   |   |   |   |   | 8 |   |
|   |   | 3 | 1 |   |   |   | 2 |   |
| 9 |   |   |   | 8 |   |   | 7 |   |
|   |   |   |   |   |   |   |   |   |
|   | 1 |   |   | 4 |   |   |   | 5 |
|   | 3 |   |   |   | 2 | 5 |   |   |
|   | 9 |   |   |   |   |   | 3 | 1 |
| 8 |   |   | 3 | 5 |   |   |   | 7 |

Standard

**30**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 |   |   | 6 |   |   |   |   | 8 |
|   |   |   |   |   | 4 | 7 | 1 |   |
|   | 1 | 6 |   | 3 | 8 |   |   |   |
|   |   | 1 |   |   |   |   |   | 5 |
| 8 |   |   | 3 |   | 9 |   |   | 7 |
| 2 |   |   |   |   |   | 8 |   |   |
|   |   |   | 4 | 9 |   | 1 | 8 |   |
|   | 4 | 8 | 5 |   |   |   |   |   |
| 9 |   |   |   |   | 3 |   |   | 4 |

Standard

**31**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 |   | 4 |   |   |   |   | 1 |
|   |   | 6 |   | 3 | 7 |   |   |   |
|   |   | 9 |   |   | 2 |   | 7 |   |
|   |   |   |   |   |   | 3 | 2 |   |
| 3 |   |   |   |   |   |   |   | 8 |
|   | 2 | 1 |   |   |   |   |   |   |
|   | 4 |   | 5 |   |   | 6 |   |   |
|   |   |   | 3 | 7 |   | 9 |   |   |
| 5 |   |   |   |   | 8 |   | 4 | 7 |

Standard

**32**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 |   |   | 9 | 7 |   |   |   |   |
|   |   |   |   | 6 | 3 |   |   | 7 |
|   | 6 |   |   |   | 1 | 9 |   |   |
|   | 5 | 2 |   |   |   |   | 7 |   |
|   | 1 |   | 2 |   | 7 |   | 6 |   |
|   | 7 |   |   |   |   | 3 | 5 |   |
|   |   | 6 | 1 |   |   |   | 9 |   |
| 9 |   |   | 7 | 8 |   |   |   |   |
|   |   |   |   | 9 | 4 |   |   | 1 |

Standard

**33**

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   |   | 7 | 6 |  |   | 2 |   |   |
|   |   |   |   |  |   |   |   | 3 |
| 9 |   | 2 | 8 |  | 7 |   | 5 |   |
| 7 | 2 | 4 |   |  |   |   | 8 |   |
|   |   |   | 7 |  | 6 |   |   |   |
|   | 1 |   |   |  |   | 5 | 4 | 7 |
|   | 7 |   | 3 |  | 2 | 1 |   | 5 |
| 3 |   |   |   |  |   |   |   |   |
|   |   | 9 |   |  | 4 | 7 |   |   |

Standard

**34**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 8 |   |   |   | 5 | 4 | 2 |
|   | 5 |   |   |   | 1 |   |   | 6 |
|   | 4 |   |   | 9 |   |   |   | 1 |
|   |   |   | 8 |   |   |   | 5 |   |
|   |   | 7 |   | 2 |   | 3 |   |   |
|   | 3 |   |   |   | 6 |   |   |   |
| 4 |   |   |   | 1 |   |   | 7 |   |
| 3 |   |   | 9 |   |   |   | 2 |   |
| 1 | 7 | 5 |   |   |   | 4 |   |   |

Standard

**35**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 3 |   |   |   | 8 |   | 6 |   |
| 7 |   |   |   |   |   |   | 1 | 8 |
|   |   |   | 1 |   | 6 |   |   |   |
| 3 |   |   | 6 | 2 |   | 5 |   |   |
|   |   |   | 9 |   | 3 |   |   |   |
|   |   | 2 |   | 8 | 7 |   |   | 1 |
|   |   |   | 8 |   | 4 |   |   |   |
| 6 | 4 |   |   |   |   |   |   | 2 |
|   | 8 |   | 7 |   |   |   | 9 | 5 |

Standard

**36**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 3 |   |   |   |   |   |   |   |   |
|   | 7 | 9 |   | 4 |   |   |   | 3 |
|   | 5 |   | 3 | 6 |   | 2 |   |   |
| 7 |   |   |   |   |   |   | 9 | 8 |
| 4 | 2 | 8 |   |   |   | 1 | 7 | 5 |
| 5 | 9 |   |   |   |   |   |   | 2 |
|   |   | 7 |   | 3 | 4 |   | 5 |   |
| 1 |   |   |   | 5 |   | 3 | 2 |   |
|   |   |   |   |   |   |   |   | 1 |

Standard

**37**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   |   | 3 |   | 2 |   |
| 5 | 2 |   |   |   |   |   |   | 6 |
|   |   | 8 | 2 | 7 |   |   | 4 | 1 |
|   |   |   |   |   | 7 | 1 |   | 4 |
| 2 |   | 4 |   | 6 |   | 9 |   | 7 |
| 1 |   | 6 | 8 |   |   |   |   |   |
| 6 | 1 |   |   | 3 | 2 | 4 |   |   |
| 8 |   |   |   |   |   |   | 5 | 3 |
|   | 3 |   | 4 |   |   |   |   |   |

Standard

**38**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 4 |   |   | 2 |   |   | 8 |
|   |   |   | 9 | 7 |   | 4 |   |   |
|   |   |   |   |   |   | 2 |   | 9 |
|   | 7 |   | 2 | 9 | 6 |   |   |   |
|   | 2 | 9 |   |   |   | 6 | 3 |   |
|   |   |   | 5 | 3 | 1 |   | 2 |   |
| 6 |   | 8 |   |   |   |   |   |   |
|   |   | 7 |   | 2 | 8 |   |   |   |
| 5 |   |   | 3 |   |   | 8 |   |   |

Standard

**39**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   |   |   | 9 | 1 |   |   |   |
| 8 | 2 |   |   | 5 |   |   |   |   |
| 7 |   |   | 6 |   |   | 4 |   | 5 |
| 1 |   |   |   |   |   | 6 |   |   |
| 6 | 8 |   |   | 4 |   |   | 3 | 2 |
|   |   | 5 |   |   |   |   |   | 7 |
| 3 |   | 8 |   |   | 5 |   |   | 1 |
|   |   |   |   | 7 |   |   | 4 | 8 |
|   |   |   | 1 | 2 |   |   |   |   |

Standard

**40**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 |   |   | 6 |   |   |   |   |   |
|   | 5 |   |   | 2 |   |   |   | 9 |
| 4 |   | 6 |   |   |   |   |   | 5 |
|   | 7 | 5 | 4 |   |   | 9 |   | 6 |
|   |   | 3 |   |   |   | 4 |   |   |
| 6 |   | 2 |   |   | 9 | 5 | 7 |   |
| 3 |   |   |   |   |   | 1 |   | 7 |
| 5 |   |   |   | 8 |   |   | 6 |   |
|   |   |   |   |   | 5 |   |   | 8 |

Standard

**41**

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   |   |   | 5 |  |   |   |   |   |
|   |   | 4 | 2 |  |   |   | 1 | 3 |
|   | 2 |   |   |  | 6 | 7 | 5 | 4 |
|   | 8 |   |   |  |   | 9 |   | 2 |
|   |   |   | 9 |  | 4 |   |   |   |
| 9 |   | 3 |   |  |   |   | 4 |   |
| 1 | 5 | 2 | 7 |  |   |   | 6 |   |
| 7 | 4 |   |   |  | 2 | 1 |   |   |
|   |   |   |   |  | 1 |   |   |   |

Hard

**42**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 |   |   |   | 2 |   |   | 9 | 8 |
|   | 2 |   |   |   | 6 |   |   |   |
| 9 |   | 3 | 4 | 8 |   | 2 |   |   |
|   |   |   |   |   | 5 |   |   |   |
| 3 | 6 |   |   | 9 |   |   | 5 | 7 |
|   |   |   | 8 |   |   |   |   |   |
|   |   | 1 |   | 4 | 2 | 5 |   | 9 |
|   |   |   | 5 |   |   |   | 2 |   |
| 2 | 8 |   |   | 7 |   |   |   | 6 |

Hard

**43**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   |   |   |   |   | 1 |   |
|   | 5 | 9 |   | 8 |   | 7 |   |   |
| 4 |   |   | 9 |   |   |   | 3 | 8 |
|   | 4 |   |   | 3 | 7 |   |   |   |
|   | 3 |   | 4 |   | 9 |   | 8 |   |
|   |   |   | 8 | 6 |   |   | 4 |   |
| 5 | 1 |   |   |   | 8 |   |   | 6 |
|   |   | 4 |   | 7 |   | 8 | 2 |   |
|   | 8 |   |   |   |   |   | 7 |   |

Hard

**44**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 5 |   |   | 2 |   | 4 | 8 |
| 4 |   |   |   |   | 7 |   |   | 2 |
| 7 | 3 | 2 |   |   |   |   |   | 9 |
|   |   |   |   |   | 9 |   |   |   |
| 2 |   | 9 |   | 4 |   | 5 |   | 1 |
|   |   |   | 5 |   |   |   |   |   |
| 1 |   |   |   |   |   | 4 | 6 | 5 |
| 8 |   |   | 4 |   |   |   |   | 7 |
| 9 | 5 |   | 6 |   |   | 2 |   |   |

Hard



**45**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 9 | 5 |   | 2 | 1 |   | 8 |   |
|   |   |   |   |   |   |   |   |   |
|   |   | 8 | 6 |   |   | 1 |   | 7 |
|   |   |   | 8 |   |   | 7 | 5 |   |
| 2 |   |   |   |   |   |   |   | 1 |
|   | 6 | 4 |   |   | 9 |   |   |   |
| 1 |   | 6 |   |   | 7 | 3 |   |   |
|   |   |   |   |   |   |   |   |   |
|   | 4 |   | 9 | 6 |   | 5 | 1 |   |

Hard

**46**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 4 |   | 3 |   |   | 6 |   |
|   |   | 2 | 1 | 7 | 9 | 8 |   | 4 |
|   | 8 |   | 6 |   |   |   |   | 2 |
|   |   | 8 |   |   |   |   | 1 |   |
| 4 |   |   |   | 9 |   |   |   | 5 |
|   | 6 |   |   |   |   | 2 |   |   |
| 2 |   |   |   |   | 6 |   | 7 |   |
| 8 |   | 1 | 7 | 2 | 3 | 9 |   |   |
|   | 9 |   |   | 8 |   | 3 |   |   |

Hard

**47**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   |   | 8 | 7 |   | 2 |   | 4 |   |
| 5 |   |   |   | 4 |   | 2 |   | 9 |
|   | 2 | 4 |   | 8 |   |   |   |   |
| 9 |   | 6 |   |   |   |   |   |   |
|   |   |   | 1 |   | 8 |   |   |   |
|   |   |   |   |   |   | 9 |   | 7 |
|   |   |   |   | 6 |   | 3 | 5 |   |
| 8 |   | 1 |   | 5 |   |   |   | 2 |
|   | 5 |   | 2 |   | 4 | 7 |   |   |

Hard

**48**

|   |   |   |   |  |   |   |   |   |
|---|---|---|---|--|---|---|---|---|
|   | 6 |   |   |  | 7 | 5 | 2 |   |
|   |   |   | 9 |  |   | 6 |   |   |
| 1 |   |   |   |  |   | 8 |   | 7 |
|   |   |   | 3 |  |   |   | 1 | 2 |
|   |   | 3 | 5 |  | 1 | 4 |   |   |
| 4 | 2 |   |   |  | 8 |   |   |   |
| 5 |   | 8 |   |  |   |   |   | 6 |
|   |   | 7 |   |  | 9 |   |   |   |
|   | 9 | 6 | 4 |  |   |   | 8 |   |

Hard

**49**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
|   | 6 |   |   |   |   |   |   | 8 |
| 2 |   | 1 | 8 |   |   | 5 |   |   |
| 9 |   | 5 |   |   | 2 |   |   |   |
|   |   |   | 7 |   | 4 | 6 |   | 2 |
| 3 |   |   |   | 9 |   |   |   | 5 |
| 5 |   | 4 | 6 |   | 8 |   |   |   |
|   |   |   | 9 |   |   | 3 |   | 1 |
|   |   | 7 |   |   | 5 | 9 |   | 6 |
| 1 |   |   |   |   |   |   | 5 |   |

Hard

**50**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 9 |   |   | 6 |   |   |   | 3 |
|   |   | 3 |   |   | 4 |   | 9 |   |
|   | 2 |   |   |   |   | 7 | 5 |   |
|   |   |   |   | 5 |   | 4 |   | 2 |
|   |   |   | 4 |   | 2 |   |   |   |
| 5 |   | 2 |   | 3 |   |   |   |   |
|   | 1 | 5 |   |   |   |   | 6 |   |
|   | 6 |   | 8 |   |   | 9 |   |   |
| 8 |   |   |   | 4 |   |   | 7 | 1 |

Hard

# SOLUTIONS

**1**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 3 | 1 | 2 | 7 | 8 | 6 | 5 | 4 |
| 5 | 8 | 4 | 9 | 1 | 6 | 7 | 3 | 2 |
| 7 | 2 | 6 | 5 | 4 | 3 | 1 | 9 | 8 |
| 1 | 5 | 3 | 8 | 2 | 4 | 9 | 7 | 6 |
| 6 | 9 | 8 | 1 | 5 | 7 | 4 | 2 | 3 |
| 4 | 7 | 2 | 6 | 3 | 9 | 5 | 8 | 1 |
| 8 | 6 | 7 | 4 | 9 | 2 | 3 | 1 | 5 |
| 3 | 4 | 5 | 7 | 8 | 1 | 2 | 6 | 9 |
| 2 | 1 | 9 | 3 | 6 | 5 | 8 | 4 | 7 |

**2**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 7 | 9 | 2 | 6 | 5 | 4 | 3 | 1 |
| 4 | 1 | 2 | 3 | 9 | 8 | 7 | 6 | 5 |
| 6 | 5 | 3 | 1 | 7 | 4 | 9 | 8 | 2 |
| 3 | 4 | 1 | 9 | 8 | 2 | 6 | 5 | 7 |
| 2 | 9 | 7 | 6 | 5 | 3 | 1 | 4 | 8 |
| 5 | 6 | 8 | 7 | 4 | 1 | 3 | 2 | 9 |
| 1 | 8 | 6 | 5 | 3 | 9 | 2 | 7 | 4 |
| 9 | 3 | 5 | 4 | 2 | 7 | 8 | 1 | 6 |
| 7 | 2 | 4 | 8 | 1 | 6 | 5 | 9 | 3 |

**3**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 8 | 5 | 4 | 3 | 1 | 9 | 2 | 7 |
| 4 | 3 | 7 | 9 | 2 | 6 | 8 | 5 | 1 |
| 2 | 1 | 9 | 8 | 7 | 5 | 6 | 4 | 3 |
| 1 | 9 | 8 | 2 | 6 | 7 | 5 | 3 | 4 |
| 5 | 2 | 4 | 3 | 1 | 8 | 7 | 6 | 9 |
| 7 | 6 | 3 | 5 | 9 | 4 | 2 | 1 | 8 |
| 3 | 7 | 6 | 1 | 8 | 2 | 4 | 9 | 5 |
| 9 | 5 | 2 | 7 | 4 | 3 | 1 | 8 | 6 |
| 8 | 4 | 1 | 6 | 5 | 9 | 3 | 7 | 2 |

**4**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 7 | 6 | 1 | 9 | 8 | 5 | 4 | 3 |
| 9 | 8 | 5 | 4 | 3 | 2 | 1 | 7 | 6 |
| 4 | 3 | 1 | 7 | 6 | 5 | 2 | 9 | 8 |
| 7 | 6 | 4 | 3 | 1 | 9 | 8 | 5 | 2 |
| 8 | 5 | 3 | 2 | 4 | 7 | 9 | 6 | 1 |
| 1 | 2 | 9 | 8 | 5 | 6 | 7 | 3 | 4 |
| 6 | 1 | 8 | 5 | 7 | 4 | 3 | 2 | 9 |
| 5 | 9 | 2 | 6 | 8 | 3 | 4 | 1 | 7 |
| 3 | 4 | 7 | 9 | 2 | 1 | 6 | 8 | 5 |

**5**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 9 | 8 | 4 | 3 | 5 | 6 | 2 | 1 |
| 3 | 6 | 5 | 2 | 1 | 9 | 8 | 4 | 7 |
| 2 | 4 | 1 | 8 | 7 | 6 | 5 | 9 | 3 |
| 6 | 7 | 4 | 9 | 8 | 1 | 2 | 3 | 5 |
| 5 | 3 | 9 | 7 | 2 | 4 | 1 | 8 | 6 |
| 1 | 8 | 2 | 6 | 5 | 3 | 9 | 7 | 4 |
| 9 | 5 | 7 | 3 | 6 | 2 | 4 | 1 | 8 |
| 8 | 2 | 6 | 1 | 4 | 7 | 3 | 5 | 9 |
| 4 | 1 | 3 | 5 | 9 | 8 | 7 | 6 | 2 |

**6**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 8 | 6 | 4 | 3 | 2 | 9 | 7 |
| 2 | 9 | 7 | 1 | 8 | 5 | 4 | 6 | 3 |
| 6 | 4 | 3 | 2 | 9 | 7 | 8 | 1 | 5 |
| 9 | 3 | 1 | 8 | 7 | 2 | 6 | 5 | 4 |
| 8 | 2 | 6 | 5 | 1 | 4 | 3 | 7 | 9 |
| 5 | 7 | 4 | 3 | 6 | 9 | 1 | 2 | 8 |
| 4 | 1 | 2 | 9 | 5 | 8 | 7 | 3 | 6 |
| 7 | 6 | 9 | 4 | 3 | 1 | 5 | 8 | 2 |
| 3 | 8 | 5 | 7 | 2 | 6 | 9 | 4 | 1 |

**7**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 3 | 2 | 5 | 7 | 6 | 1 | 9 | 4 |
| 7 | 6 | 1 | 3 | 4 | 9 | 8 | 5 | 2 |
| 5 | 4 | 9 | 2 | 8 | 1 | 7 | 6 | 3 |
| 4 | 2 | 3 | 1 | 9 | 8 | 6 | 7 | 5 |
| 6 | 1 | 8 | 7 | 5 | 4 | 2 | 3 | 9 |
| 9 | 7 | 5 | 6 | 3 | 2 | 4 | 1 | 8 |
| 3 | 8 | 4 | 9 | 6 | 7 | 5 | 2 | 1 |
| 2 | 9 | 7 | 8 | 1 | 5 | 3 | 4 | 6 |
| 1 | 5 | 6 | 4 | 2 | 3 | 9 | 8 | 7 |

**8**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 1 | 9 | 3 | 5 | 8 | 7 | 6 | 4 |
| 8 | 7 | 6 | 4 | 2 | 1 | 9 | 5 | 3 |
| 3 | 5 | 4 | 6 | 9 | 7 | 2 | 1 | 8 |
| 6 | 9 | 5 | 1 | 4 | 3 | 8 | 2 | 7 |
| 1 | 3 | 2 | 8 | 7 | 5 | 4 | 9 | 6 |
| 7 | 4 | 8 | 2 | 6 | 9 | 5 | 3 | 1 |
| 9 | 8 | 3 | 7 | 1 | 2 | 6 | 4 | 5 |
| 5 | 6 | 7 | 9 | 3 | 4 | 1 | 8 | 2 |
| 4 | 2 | 1 | 5 | 8 | 6 | 3 | 7 | 9 |

**9**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 7 | 6 | 3 | 5 | 9 | 1 | 4 |
| 5 | 1 | 3 | 7 | 4 | 9 | 2 | 8 | 6 |
| 9 | 6 | 4 | 1 | 2 | 8 | 7 | 5 | 3 |
| 1 | 9 | 8 | 5 | 7 | 3 | 4 | 6 | 2 |
| 7 | 5 | 2 | 4 | 1 | 6 | 3 | 9 | 8 |
| 4 | 3 | 6 | 9 | 8 | 2 | 1 | 7 | 5 |
| 8 | 4 | 5 | 2 | 9 | 1 | 6 | 3 | 7 |
| 6 | 7 | 1 | 3 | 5 | 4 | 8 | 2 | 9 |
| 3 | 2 | 9 | 8 | 6 | 7 | 5 | 4 | 1 |

**10**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 9 | 7 | 4 | 2 | 8 | 3 | 6 |
| 8 | 7 | 6 | 3 | 1 | 9 | 2 | 5 | 4 |
| 2 | 4 | 3 | 8 | 6 | 5 | 7 | 1 | 9 |
| 7 | 3 | 5 | 4 | 2 | 6 | 1 | 9 | 8 |
| 9 | 8 | 2 | 1 | 7 | 3 | 6 | 4 | 5 |
| 6 | 1 | 4 | 5 | 9 | 8 | 3 | 7 | 2 |
| 5 | 2 | 8 | 9 | 3 | 1 | 4 | 6 | 7 |
| 4 | 6 | 1 | 2 | 5 | 7 | 9 | 8 | 3 |
| 3 | 9 | 7 | 6 | 8 | 4 | 5 | 2 | 1 |

**11**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 8 | 6 | 1 | 5 | 9 | 2 | 3 | 4 |
| 5 | 3 | 4 | 7 | 8 | 2 | 6 | 9 | 1 |
| 2 | 1 | 9 | 6 | 4 | 3 | 8 | 7 | 5 |
| 6 | 2 | 5 | 9 | 7 | 1 | 4 | 8 | 3 |
| 3 | 4 | 1 | 8 | 2 | 6 | 9 | 5 | 7 |
| 9 | 7 | 8 | 5 | 3 | 4 | 1 | 2 | 6 |
| 1 | 6 | 7 | 2 | 9 | 5 | 3 | 4 | 8 |
| 8 | 9 | 3 | 4 | 6 | 7 | 5 | 1 | 2 |
| 4 | 5 | 2 | 3 | 1 | 8 | 7 | 6 | 9 |

**12**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 2 | 8 | 5 | 4 | 3 | 9 | 7 |
| 8 | 5 | 9 | 3 | 6 | 7 | 2 | 1 | 4 |
| 4 | 7 | 3 | 2 | 1 | 9 | 8 | 6 | 5 |
| 9 | 4 | 8 | 6 | 7 | 5 | 1 | 3 | 2 |
| 7 | 3 | 6 | 4 | 2 | 1 | 9 | 5 | 8 |
| 2 | 1 | 5 | 9 | 3 | 8 | 7 | 4 | 6 |
| 6 | 2 | 1 | 7 | 4 | 3 | 5 | 8 | 9 |
| 5 | 9 | 7 | 1 | 8 | 6 | 4 | 2 | 3 |
| 3 | 8 | 4 | 5 | 9 | 2 | 6 | 7 | 1 |

**13**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 3 | 7 | 5 | 9 | 8 | 2 | 1 |
| 2 | 1 | 9 | 8 | 6 | 4 | 5 | 7 | 3 |
| 8 | 7 | 5 | 2 | 3 | 1 | 9 | 6 | 4 |
| 7 | 5 | 2 | 3 | 4 | 8 | 6 | 1 | 9 |
| 6 | 8 | 4 | 1 | 9 | 2 | 3 | 5 | 7 |
| 3 | 9 | 1 | 6 | 7 | 5 | 4 | 8 | 2 |
| 5 | 4 | 8 | 9 | 2 | 7 | 1 | 3 | 6 |
| 1 | 3 | 7 | 4 | 8 | 6 | 2 | 9 | 5 |
| 9 | 2 | 6 | 5 | 1 | 3 | 7 | 4 | 8 |

**14**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 1 | 9 | 8 | 7 | 6 | 2 |
| 2 | 1 | 9 | 7 | 6 | 5 | 8 | 4 | 3 |
| 7 | 6 | 8 | 4 | 3 | 2 | 5 | 1 | 9 |
| 9 | 5 | 7 | 8 | 4 | 3 | 6 | 2 | 1 |
| 1 | 3 | 4 | 2 | 7 | 6 | 9 | 5 | 8 |
| 8 | 2 | 6 | 5 | 1 | 9 | 3 | 7 | 4 |
| 4 | 9 | 5 | 3 | 2 | 7 | 1 | 8 | 6 |
| 6 | 8 | 2 | 9 | 5 | 1 | 4 | 3 | 7 |
| 3 | 7 | 1 | 6 | 8 | 4 | 2 | 9 | 5 |

**15**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 5 | 1 | 3 | 2 | 9 | 8 | 7 |
| 1 | 2 | 9 | 8 | 4 | 7 | 3 | 6 | 5 |
| 7 | 3 | 8 | 9 | 5 | 6 | 1 | 4 | 2 |
| 9 | 8 | 7 | 6 | 2 | 5 | 4 | 1 | 3 |
| 6 | 5 | 4 | 7 | 1 | 3 | 8 | 2 | 9 |
| 3 | 1 | 2 | 4 | 9 | 8 | 7 | 5 | 6 |
| 2 | 4 | 1 | 5 | 7 | 9 | 6 | 3 | 8 |
| 5 | 9 | 6 | 3 | 8 | 4 | 2 | 7 | 1 |
| 8 | 7 | 3 | 2 | 6 | 1 | 5 | 9 | 4 |

**16**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 5 | 4 | 3 | 8 | 2 | 1 | 9 |
| 2 | 9 | 4 | 1 | 5 | 7 | 6 | 8 | 3 |
| 3 | 1 | 8 | 2 | 6 | 9 | 5 | 4 | 7 |
| 4 | 3 | 9 | 8 | 7 | 6 | 1 | 5 | 2 |
| 8 | 2 | 1 | 5 | 4 | 3 | 9 | 7 | 6 |
| 5 | 7 | 6 | 9 | 2 | 1 | 8 | 3 | 4 |
| 6 | 8 | 3 | 7 | 1 | 2 | 4 | 9 | 5 |
| 1 | 5 | 7 | 6 | 9 | 4 | 3 | 2 | 8 |
| 9 | 4 | 2 | 3 | 8 | 5 | 7 | 6 | 1 |

**17**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 9 | 1 | 7 | 6 | 3 | 2 | 5 | 4 |
| 4 | 6 | 3 | 5 | 8 | 2 | 1 | 9 | 7 |
| 7 | 5 | 2 | 1 | 9 | 4 | 6 | 8 | 3 |
| 3 | 1 | 8 | 4 | 7 | 9 | 5 | 2 | 6 |
| 2 | 7 | 9 | 6 | 3 | 5 | 4 | 1 | 8 |
| 6 | 4 | 5 | 2 | 1 | 8 | 3 | 7 | 9 |
| 1 | 3 | 7 | 9 | 5 | 6 | 8 | 4 | 2 |
| 9 | 2 | 6 | 8 | 4 | 1 | 7 | 3 | 5 |
| 5 | 8 | 4 | 3 | 2 | 7 | 9 | 6 | 1 |

**18**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 9 | 3 | 8 | 2 | 5 | 7 | 4 |
| 8 | 7 | 5 | 6 | 4 | 1 | 3 | 2 | 9 |
| 4 | 3 | 2 | 9 | 7 | 5 | 6 | 1 | 8 |
| 9 | 8 | 7 | 1 | 3 | 6 | 4 | 5 | 2 |
| 3 | 5 | 6 | 4 | 2 | 8 | 1 | 9 | 7 |
| 2 | 4 | 1 | 7 | 5 | 9 | 8 | 3 | 6 |
| 7 | 2 | 3 | 8 | 1 | 4 | 9 | 6 | 5 |
| 6 | 1 | 8 | 5 | 9 | 7 | 2 | 4 | 3 |
| 5 | 9 | 4 | 2 | 6 | 3 | 7 | 8 | 1 |

**19**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 6 | 4 | 8 | 7 | 9 | 3 | 2 | 5 |
| 3 | 7 | 2 | 6 | 1 | 5 | 9 | 4 | 8 |
| 9 | 5 | 8 | 4 | 3 | 2 | 7 | 1 | 6 |
| 6 | 4 | 1 | 9 | 2 | 3 | 5 | 8 | 7 |
| 8 | 3 | 5 | 1 | 6 | 7 | 4 | 9 | 2 |
| 2 | 9 | 7 | 5 | 8 | 4 | 6 | 3 | 1 |
| 5 | 8 | 6 | 3 | 9 | 1 | 2 | 7 | 4 |
| 4 | 2 | 3 | 7 | 5 | 8 | 1 | 6 | 9 |
| 7 | 1 | 9 | 2 | 4 | 6 | 8 | 5 | 3 |

**20**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 4 | 6 | 8 | 2 | 9 | 1 | 5 | 3 |
| 5 | 3 | 2 | 7 | 4 | 1 | 6 | 9 | 8 |
| 1 | 8 | 9 | 6 | 5 | 3 | 2 | 4 | 7 |
| 4 | 7 | 1 | 5 | 9 | 6 | 8 | 3 | 2 |
| 8 | 2 | 5 | 4 | 3 | 7 | 9 | 6 | 1 |
| 6 | 9 | 3 | 2 | 1 | 8 | 5 | 7 | 4 |
| 3 | 1 | 4 | 9 | 6 | 2 | 7 | 8 | 5 |
| 2 | 6 | 8 | 3 | 7 | 5 | 4 | 1 | 9 |
| 9 | 5 | 7 | 1 | 8 | 4 | 3 | 2 | 6 |

**21**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 4 | 8 | 9 | 7 | 2 | 5 | 3 | 1 |
| 5 | 7 | 3 | 4 | 1 | 8 | 9 | 6 | 2 |
| 2 | 1 | 9 | 6 | 3 | 5 | 8 | 7 | 4 |
| 4 | 3 | 7 | 2 | 9 | 1 | 6 | 8 | 5 |
| 8 | 9 | 6 | 3 | 5 | 4 | 2 | 1 | 7 |
| 1 | 5 | 2 | 8 | 6 | 7 | 4 | 9 | 3 |
| 3 | 2 | 5 | 1 | 8 | 9 | 7 | 4 | 6 |
| 9 | 6 | 4 | 7 | 2 | 3 | 1 | 5 | 8 |
| 7 | 8 | 1 | 5 | 4 | 6 | 3 | 2 | 9 |

**22**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 8 | 3 | 7 | 6 | 1 | 2 | 9 | 5 |
| 2 | 1 | 9 | 3 | 4 | 5 | 8 | 7 | 6 |
| 7 | 6 | 5 | 2 | 9 | 8 | 4 | 3 | 1 |
| 1 | 5 | 8 | 6 | 3 | 4 | 9 | 2 | 7 |
| 3 | 4 | 7 | 5 | 2 | 9 | 6 | 1 | 8 |
| 9 | 2 | 6 | 1 | 8 | 7 | 5 | 4 | 3 |
| 8 | 7 | 2 | 9 | 5 | 3 | 1 | 6 | 4 |
| 6 | 3 | 4 | 8 | 1 | 2 | 7 | 5 | 9 |
| 5 | 9 | 1 | 4 | 7 | 6 | 3 | 8 | 2 |

**23**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 9 | 4 | 2 | 8 | 3 | 7 | 6 |
| 7 | 4 | 3 | 6 | 5 | 1 | 2 | 9 | 8 |
| 6 | 2 | 8 | 9 | 7 | 3 | 5 | 4 | 1 |
| 9 | 3 | 7 | 8 | 4 | 2 | 1 | 6 | 5 |
| 5 | 8 | 6 | 3 | 1 | 9 | 4 | 2 | 7 |
| 2 | 1 | 4 | 7 | 6 | 5 | 9 | 8 | 3 |
| 4 | 9 | 1 | 5 | 8 | 7 | 6 | 3 | 2 |
| 3 | 7 | 2 | 1 | 9 | 6 | 8 | 5 | 4 |
| 8 | 6 | 5 | 2 | 3 | 4 | 7 | 1 | 9 |

**24**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 9 | 7 | 6 | 5 | 1 | 4 | 3 |
| 3 | 7 | 1 | 4 | 9 | 2 | 5 | 8 | 6 |
| 6 | 5 | 4 | 3 | 1 | 8 | 2 | 9 | 7 |
| 1 | 6 | 5 | 2 | 4 | 9 | 3 | 7 | 8 |
| 9 | 3 | 8 | 6 | 7 | 1 | 4 | 2 | 5 |
| 7 | 4 | 2 | 5 | 8 | 3 | 6 | 1 | 9 |
| 4 | 2 | 7 | 8 | 5 | 6 | 9 | 3 | 1 |
| 5 | 1 | 3 | 9 | 2 | 7 | 8 | 6 | 4 |
| 8 | 9 | 6 | 1 | 3 | 4 | 7 | 5 | 2 |



**25**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 5 | 6 | 4 | 8 | 9 | 7 | 3 | 2 |
| 4 | 3 | 8 | 2 | 6 | 7 | 9 | 5 | 1 |
| 2 | 9 | 7 | 1 | 5 | 3 | 8 | 4 | 6 |
| 7 | 1 | 5 | 9 | 4 | 6 | 3 | 2 | 8 |
| 9 | 2 | 3 | 5 | 1 | 8 | 6 | 7 | 4 |
| 6 | 8 | 4 | 7 | 3 | 2 | 1 | 9 | 5 |
| 3 | 4 | 2 | 6 | 9 | 1 | 5 | 8 | 7 |
| 8 | 7 | 1 | 3 | 2 | 5 | 4 | 6 | 9 |
| 5 | 6 | 9 | 8 | 7 | 4 | 2 | 1 | 3 |

**26**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 1 | 7 | 5 | 8 | 4 | 9 | 3 | 2 |
| 9 | 5 | 8 | 3 | 2 | 1 | 7 | 4 | 6 |
| 4 | 3 | 2 | 9 | 7 | 6 | 1 | 8 | 5 |
| 5 | 7 | 6 | 2 | 4 | 9 | 8 | 1 | 3 |
| 3 | 2 | 1 | 8 | 6 | 7 | 5 | 9 | 4 |
| 8 | 4 | 9 | 1 | 5 | 3 | 6 | 2 | 7 |
| 2 | 9 | 5 | 7 | 3 | 8 | 4 | 6 | 1 |
| 1 | 6 | 3 | 4 | 9 | 5 | 2 | 7 | 8 |
| 7 | 8 | 4 | 6 | 1 | 2 | 3 | 5 | 9 |

**27**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 8 | 1 | 2 | 9 | 5 | 4 | 3 |
| 2 | 5 | 4 | 8 | 3 | 7 | 1 | 9 | 6 |
| 1 | 3 | 9 | 6 | 5 | 4 | 8 | 2 | 7 |
| 5 | 9 | 2 | 7 | 1 | 3 | 6 | 8 | 4 |
| 8 | 4 | 6 | 5 | 9 | 2 | 7 | 3 | 1 |
| 3 | 1 | 7 | 4 | 8 | 6 | 2 | 5 | 9 |
| 9 | 2 | 5 | 3 | 7 | 1 | 4 | 6 | 8 |
| 6 | 7 | 3 | 2 | 4 | 8 | 9 | 1 | 5 |
| 4 | 8 | 1 | 9 | 6 | 5 | 3 | 7 | 2 |

**28**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 4 | 8 | 3 | 1 | 2 | 6 | 9 | 5 |
| 9 | 2 | 6 | 5 | 8 | 7 | 1 | 4 | 3 |
| 3 | 5 | 1 | 6 | 4 | 9 | 2 | 8 | 7 |
| 4 | 8 | 9 | 2 | 3 | 6 | 7 | 5 | 1 |
| 6 | 1 | 5 | 7 | 9 | 8 | 4 | 3 | 2 |
| 2 | 3 | 7 | 4 | 5 | 1 | 9 | 6 | 8 |
| 8 | 7 | 4 | 9 | 2 | 5 | 3 | 1 | 6 |
| 5 | 6 | 3 | 1 | 7 | 4 | 8 | 2 | 9 |
| 1 | 9 | 2 | 8 | 6 | 3 | 5 | 7 | 4 |

**29**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 8 | 7 | 2 | 6 | 4 | 9 | 5 | 3 |
| 4 | 2 | 9 | 5 | 3 | 7 | 1 | 8 | 6 |
| 6 | 5 | 3 | 1 | 9 | 8 | 7 | 2 | 4 |
| 9 | 4 | 5 | 6 | 8 | 1 | 3 | 7 | 2 |
| 3 | 7 | 6 | 9 | 2 | 5 | 4 | 1 | 8 |
| 2 | 1 | 8 | 7 | 4 | 3 | 6 | 9 | 5 |
| 7 | 3 | 4 | 8 | 1 | 2 | 5 | 6 | 9 |
| 5 | 9 | 2 | 4 | 7 | 6 | 8 | 3 | 1 |
| 8 | 6 | 1 | 3 | 5 | 9 | 2 | 4 | 7 |

**30**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 9 | 5 | 6 | 7 | 1 | 2 | 3 | 8 |
| 3 | 8 | 2 | 9 | 5 | 4 | 7 | 1 | 6 |
| 7 | 1 | 6 | 2 | 3 | 8 | 4 | 5 | 9 |
| 6 | 7 | 1 | 8 | 4 | 2 | 3 | 9 | 5 |
| 8 | 5 | 4 | 3 | 1 | 9 | 6 | 2 | 7 |
| 2 | 3 | 9 | 7 | 6 | 5 | 8 | 4 | 1 |
| 5 | 6 | 3 | 4 | 9 | 7 | 1 | 8 | 2 |
| 1 | 4 | 8 | 5 | 2 | 6 | 9 | 7 | 3 |
| 9 | 2 | 7 | 1 | 8 | 3 | 5 | 6 | 4 |

**31**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 2 | 8 | 7 | 4 | 9 | 6 | 5 | 3 | 1 |
| 1 | 5 | 6 | 8 | 3 | 7 | 2 | 9 | 4 |
| 4 | 3 | 9 | 1 | 5 | 2 | 8 | 7 | 6 |
| 8 | 7 | 5 | 6 | 4 | 1 | 3 | 2 | 9 |
| 3 | 6 | 4 | 9 | 2 | 5 | 7 | 1 | 8 |
| 9 | 2 | 1 | 7 | 8 | 3 | 4 | 6 | 5 |
| 7 | 4 | 2 | 5 | 1 | 9 | 6 | 8 | 3 |
| 6 | 1 | 8 | 3 | 7 | 4 | 9 | 5 | 2 |
| 5 | 9 | 3 | 2 | 6 | 8 | 1 | 4 | 7 |

**32**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 2 | 3 | 9 | 7 | 5 | 4 | 1 | 6 |
| 1 | 9 | 4 | 8 | 6 | 3 | 5 | 2 | 7 |
| 7 | 6 | 5 | 4 | 2 | 1 | 9 | 8 | 3 |
| 6 | 5 | 2 | 3 | 4 | 8 | 1 | 7 | 9 |
| 3 | 1 | 9 | 2 | 5 | 7 | 8 | 6 | 4 |
| 4 | 7 | 8 | 6 | 1 | 9 | 3 | 5 | 2 |
| 5 | 4 | 6 | 1 | 3 | 2 | 7 | 9 | 8 |
| 9 | 3 | 1 | 7 | 8 | 6 | 2 | 4 | 5 |
| 2 | 8 | 7 | 5 | 9 | 4 | 6 | 3 | 1 |

**33**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 4 | 7 | 6 | 5 | 3 | 2 | 1 | 9 |
| 1 | 6 | 5 | 4 | 2 | 9 | 8 | 7 | 3 |
| 9 | 3 | 2 | 8 | 1 | 7 | 6 | 5 | 4 |
| 7 | 2 | 4 | 5 | 3 | 1 | 9 | 8 | 6 |
| 5 | 9 | 8 | 7 | 4 | 6 | 3 | 2 | 1 |
| 6 | 1 | 3 | 2 | 9 | 8 | 5 | 4 | 7 |
| 4 | 7 | 6 | 3 | 8 | 2 | 1 | 9 | 5 |
| 3 | 8 | 1 | 9 | 7 | 5 | 4 | 6 | 2 |
| 2 | 5 | 9 | 1 | 6 | 4 | 7 | 3 | 8 |

**34**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 1 | 8 | 7 | 6 | 3 | 5 | 4 | 2 |
| 7 | 5 | 3 | 2 | 4 | 1 | 9 | 8 | 6 |
| 6 | 4 | 2 | 5 | 9 | 8 | 7 | 3 | 1 |
| 2 | 9 | 1 | 8 | 3 | 7 | 6 | 5 | 4 |
| 5 | 6 | 7 | 4 | 2 | 9 | 3 | 1 | 8 |
| 8 | 3 | 4 | 1 | 5 | 6 | 2 | 9 | 7 |
| 4 | 2 | 9 | 6 | 1 | 5 | 8 | 7 | 3 |
| 3 | 8 | 6 | 9 | 7 | 4 | 1 | 2 | 5 |
| 1 | 7 | 5 | 3 | 8 | 2 | 4 | 6 | 9 |

**35**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 3 | 1 | 2 | 5 | 8 | 7 | 6 | 4 |
| 7 | 6 | 5 | 4 | 3 | 9 | 2 | 1 | 8 |
| 8 | 2 | 4 | 1 | 7 | 6 | 9 | 5 | 3 |
| 3 | 7 | 8 | 6 | 2 | 1 | 5 | 4 | 9 |
| 5 | 1 | 6 | 9 | 4 | 3 | 8 | 2 | 7 |
| 4 | 9 | 2 | 5 | 8 | 7 | 6 | 3 | 1 |
| 2 | 5 | 9 | 8 | 1 | 4 | 3 | 7 | 6 |
| 6 | 4 | 7 | 3 | 9 | 5 | 1 | 8 | 2 |
| 1 | 8 | 3 | 7 | 6 | 2 | 4 | 9 | 5 |

**36**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 3 | 1 | 2 | 9 | 8 | 5 | 7 | 6 | 4 |
| 6 | 7 | 9 | 2 | 4 | 1 | 5 | 8 | 3 |
| 8 | 5 | 4 | 3 | 6 | 7 | 2 | 1 | 9 |
| 7 | 6 | 3 | 5 | 1 | 2 | 4 | 9 | 8 |
| 4 | 2 | 8 | 6 | 9 | 3 | 1 | 7 | 5 |
| 5 | 9 | 1 | 4 | 7 | 8 | 6 | 3 | 2 |
| 2 | 8 | 7 | 1 | 3 | 4 | 9 | 5 | 6 |
| 1 | 4 | 6 | 8 | 5 | 9 | 3 | 2 | 7 |
| 9 | 3 | 5 | 7 | 2 | 6 | 8 | 4 | 1 |

**37**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 7 | 1 | 5 | 3 | 8 | 2 | 9 |
| 5 | 2 | 1 | 9 | 4 | 8 | 3 | 7 | 6 |
| 3 | 9 | 8 | 2 | 7 | 6 | 5 | 4 | 1 |
| 9 | 8 | 3 | 5 | 2 | 7 | 1 | 6 | 4 |
| 2 | 5 | 4 | 3 | 6 | 1 | 9 | 8 | 7 |
| 1 | 7 | 6 | 8 | 9 | 4 | 2 | 3 | 5 |
| 6 | 1 | 5 | 7 | 3 | 2 | 4 | 9 | 8 |
| 8 | 4 | 2 | 6 | 1 | 9 | 7 | 5 | 3 |
| 7 | 3 | 9 | 4 | 8 | 5 | 6 | 1 | 2 |

**38**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 9 | 5 | 4 | 1 | 6 | 2 | 3 | 7 | 8 |
| 2 | 8 | 3 | 9 | 7 | 5 | 4 | 6 | 1 |
| 7 | 6 | 1 | 8 | 4 | 3 | 2 | 5 | 9 |
| 3 | 7 | 5 | 2 | 9 | 6 | 1 | 8 | 4 |
| 1 | 2 | 9 | 7 | 8 | 4 | 6 | 3 | 5 |
| 8 | 4 | 6 | 5 | 3 | 1 | 9 | 2 | 7 |
| 6 | 3 | 8 | 4 | 5 | 9 | 7 | 1 | 2 |
| 4 | 1 | 7 | 6 | 2 | 8 | 5 | 9 | 3 |
| 5 | 9 | 2 | 3 | 1 | 7 | 8 | 4 | 6 |

**39**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 5 | 4 | 3 | 8 | 9 | 1 | 2 | 7 | 6 |
| 8 | 2 | 6 | 7 | 5 | 4 | 3 | 1 | 9 |
| 7 | 1 | 9 | 6 | 3 | 2 | 4 | 8 | 5 |
| 1 | 9 | 2 | 3 | 8 | 7 | 6 | 5 | 4 |
| 6 | 8 | 7 | 5 | 4 | 9 | 1 | 3 | 2 |
| 4 | 3 | 5 | 2 | 1 | 6 | 8 | 9 | 7 |
| 3 | 7 | 8 | 4 | 6 | 5 | 9 | 2 | 1 |
| 2 | 6 | 1 | 9 | 7 | 3 | 5 | 4 | 8 |
| 9 | 5 | 4 | 1 | 2 | 8 | 7 | 6 | 3 |

**40**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 3 | 9 | 6 | 5 | 1 | 8 | 4 | 2 |
| 8 | 5 | 1 | 7 | 2 | 4 | 6 | 3 | 9 |
| 4 | 2 | 6 | 3 | 9 | 8 | 7 | 1 | 5 |
| 1 | 7 | 5 | 4 | 3 | 2 | 9 | 8 | 6 |
| 9 | 8 | 3 | 5 | 6 | 7 | 4 | 2 | 1 |
| 6 | 4 | 2 | 8 | 1 | 9 | 5 | 7 | 3 |
| 3 | 9 | 8 | 2 | 4 | 6 | 1 | 5 | 7 |
| 5 | 1 | 7 | 9 | 8 | 3 | 2 | 6 | 4 |
| 2 | 6 | 4 | 1 | 7 | 5 | 3 | 9 | 8 |

**41**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 1 | 7 | 5 | 4 | 3 | 8 | 2 | 9 |
| 5 | 9 | 4 | 2 | 7 | 8 | 6 | 1 | 3 |
| 3 | 2 | 8 | 1 | 9 | 6 | 7 | 5 | 4 |
| 4 | 8 | 1 | 3 | 6 | 5 | 9 | 7 | 2 |
| 2 | 7 | 5 | 9 | 1 | 4 | 3 | 8 | 6 |
| 9 | 6 | 3 | 8 | 2 | 7 | 5 | 4 | 1 |
| 1 | 5 | 2 | 7 | 3 | 9 | 4 | 6 | 8 |
| 7 | 4 | 9 | 6 | 8 | 2 | 1 | 3 | 5 |
| 8 | 3 | 6 | 4 | 5 | 1 | 2 | 9 | 7 |

**42**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 5 | 4 | 7 | 2 | 3 | 1 | 9 | 8 |
| 1 | 2 | 8 | 9 | 5 | 6 | 3 | 7 | 4 |
| 9 | 7 | 3 | 4 | 8 | 1 | 2 | 6 | 5 |
| 8 | 4 | 7 | 2 | 6 | 5 | 9 | 3 | 1 |
| 3 | 6 | 2 | 1 | 9 | 4 | 8 | 5 | 7 |
| 5 | 1 | 9 | 8 | 3 | 7 | 6 | 4 | 2 |
| 7 | 3 | 1 | 6 | 4 | 2 | 5 | 8 | 9 |
| 4 | 9 | 6 | 5 | 1 | 8 | 7 | 2 | 3 |
| 2 | 8 | 5 | 3 | 7 | 9 | 4 | 1 | 6 |

**43**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 6 | 3 | 7 | 5 | 4 | 2 | 1 | 9 |
| 1 | 5 | 9 | 3 | 8 | 2 | 7 | 6 | 4 |
| 4 | 7 | 2 | 9 | 1 | 6 | 5 | 3 | 8 |
| 9 | 4 | 8 | 1 | 3 | 7 | 6 | 5 | 2 |
| 6 | 3 | 5 | 4 | 2 | 9 | 1 | 8 | 7 |
| 7 | 2 | 1 | 8 | 6 | 5 | 9 | 4 | 3 |
| 5 | 1 | 7 | 2 | 4 | 8 | 3 | 9 | 6 |
| 3 | 9 | 4 | 6 | 7 | 1 | 8 | 2 | 5 |
| 2 | 8 | 6 | 5 | 9 | 3 | 4 | 7 | 1 |

**44**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 1 | 5 | 3 | 9 | 2 | 7 | 4 | 8 |
| 4 | 9 | 8 | 1 | 6 | 7 | 3 | 5 | 2 |
| 7 | 3 | 2 | 8 | 5 | 4 | 6 | 1 | 9 |
| 5 | 4 | 1 | 2 | 3 | 9 | 8 | 7 | 6 |
| 2 | 8 | 9 | 7 | 4 | 6 | 5 | 3 | 1 |
| 3 | 7 | 6 | 5 | 1 | 8 | 9 | 2 | 4 |
| 1 | 2 | 7 | 9 | 8 | 3 | 4 | 6 | 5 |
| 8 | 6 | 3 | 4 | 2 | 5 | 1 | 9 | 7 |
| 9 | 5 | 4 | 6 | 7 | 1 | 2 | 8 | 3 |

**45**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 6 | 9 | 5 | 7 | 2 | 1 | 4 | 8 | 3 |
| 4 | 7 | 1 | 3 | 9 | 8 | 2 | 6 | 5 |
| 3 | 2 | 8 | 6 | 5 | 4 | 1 | 9 | 7 |
| 9 | 1 | 3 | 8 | 4 | 2 | 7 | 5 | 6 |
| 2 | 8 | 7 | 5 | 3 | 6 | 9 | 4 | 1 |
| 5 | 6 | 4 | 1 | 7 | 9 | 8 | 3 | 2 |
| 1 | 5 | 6 | 4 | 8 | 7 | 3 | 2 | 9 |
| 8 | 3 | 9 | 2 | 1 | 5 | 6 | 7 | 4 |
| 7 | 4 | 2 | 9 | 6 | 3 | 5 | 1 | 8 |

**46**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 5 | 7 | 4 | 2 | 3 | 8 | 1 | 6 | 9 |
| 6 | 3 | 2 | 1 | 7 | 9 | 8 | 5 | 4 |
| 1 | 8 | 9 | 6 | 5 | 4 | 7 | 3 | 2 |
| 9 | 2 | 8 | 5 | 6 | 7 | 4 | 1 | 3 |
| 4 | 1 | 7 | 3 | 9 | 2 | 6 | 8 | 5 |
| 3 | 6 | 5 | 8 | 4 | 1 | 2 | 9 | 7 |
| 2 | 4 | 3 | 9 | 1 | 6 | 5 | 7 | 8 |
| 8 | 5 | 1 | 7 | 2 | 3 | 9 | 4 | 6 |
| 7 | 9 | 6 | 4 | 8 | 5 | 3 | 2 | 1 |

**47**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 9 | 8 | 7 | 3 | 2 | 5 | 4 | 6 |
| 5 | 3 | 7 | 6 | 4 | 1 | 2 | 8 | 9 |
| 6 | 2 | 4 | 9 | 8 | 5 | 1 | 7 | 3 |
| 9 | 1 | 6 | 4 | 7 | 3 | 8 | 2 | 5 |
| 2 | 7 | 5 | 1 | 9 | 8 | 6 | 3 | 4 |
| 4 | 8 | 3 | 5 | 2 | 6 | 9 | 1 | 7 |
| 7 | 4 | 2 | 8 | 6 | 9 | 3 | 5 | 1 |
| 8 | 6 | 1 | 3 | 5 | 7 | 4 | 9 | 2 |
| 3 | 5 | 9 | 2 | 1 | 4 | 7 | 6 | 8 |

**48**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 8 | 6 | 4 | 1 | 3 | 7 | 5 | 2 | 9 |
| 7 | 5 | 2 | 9 | 8 | 4 | 6 | 3 | 1 |
| 1 | 3 | 9 | 6 | 5 | 2 | 8 | 4 | 7 |
| 9 | 8 | 5 | 3 | 4 | 6 | 7 | 1 | 2 |
| 6 | 7 | 3 | 5 | 2 | 1 | 4 | 9 | 8 |
| 4 | 2 | 1 | 7 | 9 | 8 | 3 | 6 | 5 |
| 5 | 4 | 8 | 2 | 1 | 3 | 9 | 7 | 6 |
| 3 | 1 | 7 | 8 | 6 | 9 | 2 | 5 | 4 |
| 2 | 9 | 6 | 4 | 7 | 5 | 1 | 8 | 3 |

**49**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 7 | 6 | 3 | 5 | 4 | 9 | 2 | 1 | 8 |
| 2 | 4 | 1 | 8 | 7 | 6 | 5 | 9 | 3 |
| 9 | 8 | 5 | 3 | 1 | 2 | 7 | 6 | 4 |
| 8 | 1 | 9 | 7 | 5 | 4 | 6 | 3 | 2 |
| 3 | 7 | 6 | 2 | 9 | 1 | 4 | 8 | 5 |
| 5 | 2 | 4 | 6 | 3 | 8 | 1 | 7 | 9 |
| 6 | 5 | 8 | 9 | 2 | 7 | 3 | 4 | 1 |
| 4 | 3 | 7 | 1 | 8 | 5 | 9 | 2 | 6 |
| 1 | 9 | 2 | 4 | 6 | 3 | 8 | 5 | 7 |

**50**

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 9 | 4 | 7 | 6 | 5 | 8 | 2 | 3 |
| 7 | 5 | 3 | 2 | 8 | 4 | 1 | 9 | 6 |
| 6 | 2 | 8 | 3 | 9 | 1 | 7 | 5 | 4 |
| 9 | 7 | 1 | 6 | 5 | 8 | 4 | 3 | 2 |
| 3 | 8 | 6 | 4 | 7 | 2 | 5 | 1 | 9 |
| 5 | 4 | 2 | 1 | 3 | 9 | 6 | 8 | 7 |
| 4 | 1 | 5 | 9 | 2 | 7 | 3 | 6 | 8 |
| 2 | 6 | 7 | 8 | 1 | 3 | 9 | 4 | 5 |
| 8 | 3 | 9 | 5 | 4 | 6 | 2 | 7 | 1 |



**FOR BETTER BRAINS.**

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