5. Magic Trick

Program Name: Trick.java Input File: trick.dat

At the Math Club's annual banquet, the after-dinner speaker asked one of the students to give him an integer between 34 and 50. The student said 43. The speaker then created a 4 x 4 square in which each column, each row, and each diagonal summed to the magic number 43. This kind of square is called a magic square.

```
 8 11 23  1
22  2  7 12
 3 25  9  6
10  5  4 24
```

After some investigation and discussion, one member of the club discovered the speaker's trick. The numbers 1 through 12 are preset in certain places as shown in the square to the right. The remaining four numbers are consecutive integers and will always begin with 21 less than the magic number. In this case, 43 – 21 = 22 so the numbers 22, 23, 24, and 25 are placed in the remaining four positions.

You will be given a magic number and a 4 x 4 square with the numbers 1 through 12 already preset. You are to write a program to determine the position of the remaining four numbers so that the square meets all the above criteria for a magic square.

Input

The first line will contain a single integer `n` that indicates the number of data sets to follow. The first line of each data set will contain the magic number and will be followed by a set of 4 lines that contain a 4 x 4 square. The square will contain the numbers 1 through 12 and asterisks (`*`) to indicate where the remaining four integers will be placed.

Output

For each magic number and 4 x 4 square, create a magic square that meets all of the criteria above by replacing the asterisks (`*`) with the correct numbers. Print whitespace between each magic square.

Example Input File

```
2
43
8 11 * 1
* 2 7 12
3 * 9 6
10 5 4 *
42
* 1 12 7
11 8 * 2
5 10 3 *
4 * 6 9
```

Example Output to Screen

```
8 11 23 1
22 2 7 12
3 25 9 6
10 5 4 24

22 1 12 7
11 8 21 2
5 10 3 24
4 23 6 9
```