Puzzle 1: Find the Missing Number

Given the following matrix, find the missing number:

16	2	3	13
5	11	?	8
9	7	6	12
4	14	15	1

Solution: This is a magic square where the sum of numbers in each row, column, and diagonal is the same. First, calculate the sum of the first row:

$$16 + 2 + 3 + 13 = 34$$

Now, for the second row:

$$5 + 11 + ? + 8 = 34$$

$$? = 34 - (5 + 11 + 8) = 34 - 24 = 10$$

So, the missing number is **10**.

Puzzle 2: Matrix Rotation

You are given a 3x3 matrix:

$$\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$$

What would the matrix look like after rotating it 90 degrees clockwise?

Solution: After rotating the matrix 90 degrees clockwise, the elements shift positions as follows:

$$\begin{bmatrix} 7 & 4 & 1 \\ 8 & 5 & 2 \\ 9 & 6 & 3 \end{bmatrix}$$

Puzzle 3: Pattern Recognition

Given the matrix below, find the pattern and predict the next element:

$$\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \\ 3 & 6 & 9 & 12 \\ 4 & 8 & 12 & ? \end{bmatrix}$$

Solution: This matrix represents the multiplication table. Each element at position (i, j) is given by the formula $i \times j$. So, the missing element in the 4th row and 4th column is:

$$4 \times 4 = 16$$

Thus, the missing number is **16**.