1 Introduction, Day 2

Counting refers to the possibility of comparing the sums of a set of cages with the sums of the rows or columns they occupy. In a $4 \times 4$ puzzle, the row sums are $1 + 2 + 3 + 4 = 10$. In $5 \times 5$ the row sums are 15 and in $6 \times 6$ puzzles, its 21. Can you find the row sum for an $n \times n$ puzzle? Besides reading this Day 2 discussion, your homework for tomorrow is the E puzzle.

2 Counting

Consider the $6 \times 6$ KenKen fragment below. Find the digit that goes in the cell with the $x$. That is, find the value of $x$.

\[
\begin{array}{cccc}
 x & 20+ & & \\
\end{array}
\]

Of course, the sum of the entries in each row is $1 + 2 + \cdots + 6 = 21$. So the cell with the $x$ must be exactly $21 - 20 = 1$. You’ll see more examples of this idea below.
The sum of the row entries, \(a + b + c + d + e + f\) is 21, so the sum of the 5 non-\(d\) entries in the column must be \(37 - 21 = 16\). Hence \(d = 21 - 16 = 5\).

Let’s go back to the sample 3 \(\times\) 3 puzzle we saw in the introduction.

Let \(a, b,\) and \(c\) denote the digits in the bottom row as shown. We don’t know how the letters match with the digits 1, 2, and 3, but we do know that \(a + b + c = 6\), and therefore the sum of the other three entries must be 4. But there is only one way to get 4 as the sum of three numbers in the set \(\{1, 2, 3\}\), two 1s and a 2. And we know how they must be arranged, don’t we. So we have
See if you can finish the puzzle from here.