6409 Some Pretty Peculiar Cells

Samantha is a graduate student who has been studying a new variety of cells, which she named SPP (Some Pretty Peculiar) Cells. Samantha's first observations of SPP cells led her to believe that they are benign. That is, they neither increase nor decrease their number over time. Further investigations, by a co-researcher who wanted to duplicate her results, showed SPP cells to be a very aggressive type of cells that double their number every minute. Now Samantha has to explain her conclusions about SPP cells being benign to her supervisor who is very unhappy about the time he has wasted on a grant application based on her results.

Samantha has a theory to explain her data, which goes as follows:

> Each SPP cell occupies exactly one (1) square micrometre of space in the rectangular Petri dish. As the population of SPP cells grows exponentially fast, they very quickly occupy all the space in the Petri dish (i.e., there are as many cells as the area of the dish). When this happens, a large number of the cells die from overcrowding.
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> The way the cells divide and die is very unique according to the theory. When the space in the dish does not allow for all the cells to divide, a number of cells go into hibernation for one (1) minute. Each of the remaining cells duplicates, which makes the total number of cells equal to the Petri dish's area. The newly born cells then die immediately from overcrowding. In the next minute, all the hibernating cells wake up and continue their exponential growth.
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> For example, consider a rectangular Petri dish with an area of 100,000 square micrometres that contains 30,000 SPP cells at the starting time $T = 0$. At 1 minute, every cell splits and there will be 60,000 SPP cells. In the second minute 40,000 SPP cells will duplicate and 20,000 will hibernate, which brings the total number of cells to 100,000. The 80,000 cells that were just born will die, from overcrowding, leaving just 20,000 SPP cells at the beginning of the second minute. At the third minute the disc will have 40,000 SPP cells, and so on.

Your task is to write a program to verify Samantha's theory. Your program should report the smallest interval of time T, where $T > 0$, at which time the Petri dish contains the same number of SPP cells as it has at time $T = 0$. If there is no such interval, the program should report `IMPOSSIBLE!`

Input

The input starts with an integer N, on a line by itself, that represents the number of cases. $1 \leq N \leq 1000$. The description for each case consists of three integers, X, Y and A, separated by single blank spaces, on a line by themselves. X and Y represent the length of the rectangular Petri dish sides in micrometres, and A is the starting number of SPP cells in the Petri dish. $1 \leq X, Y, A \leq 40000$.

Output

The output consists of a single line, for each test case, which contains the shortest interval of non-zero time until the number of SPP cells is the same as it was at time 0. If there is no such interval print the string '`IMPOSSIBLE!`'

Sample Input

```
3
348
372
10000 10000 1
```

Sample Output

```
2
6
IMPOSSIBLE!
```