

# Recursive sequences

Bernie wishes to impress his math teacher with a new theorem. He observes some sequences which satisfy a recursive relation

$$a_{n+2} = 2a_{n+1} - a_n + 2$$

Each sequence of his concern starts with number  $a_1 = 1$ , but the second numbers differ. Bernie thinks he found a nice rule, which he wants to check. He thinks that no matter what the number  $a_2$  is and no matter which  $n$  he chooses, one always can find an element of the sequence which equals  $a_n a_{n+1}$ .

You can help him in his investigations by finding required elements.

## Input

There is  $K$  ( $1 \leq K \leq 1\,000$ ) lines of standard input. Each consists of two integer numbers  $a_2, n$  ( $2 \leq a_2 \leq 1\,000, 1 \leq n \leq 1\,000\,000\,000$ ) separated by spaces.

The line  $K+1$  will contain two zeros, which shouldn't be processed.

## Output

Write out  $K$  lines of output - one for each testcase. For each testcase the line should contain the smallest positive integer  $m$  such that  $a_m = a_n a_{n+1}$  or the number 0 if such an  $m$  doesn't exist.

## Example

**Input:**

2 1  
2 2  
2 4  
3 5  
0 0

**Output:**

2  
4  
14  
26

## Scoring

For solving this problem you will score 10 points.