

Given the value of $a+b$ and ab you will have to find the value of $a^n + b^n$

Input

The input file contains several lines of inputs. Each line except the last line contains 3 non-negative integers p , q and n . Here p denotes the value of $a+b$ and q denotes the value of ab . Input is terminated by a line containing only two zeroes. This line should not be processed. Each number in the input file fits in a signed 32-bit integer. There will be no such input so that you have to find the value of 0^0 .

Output

For each line of input except the last one produce one line of output. This line contains the value of $a^n + b^n$. You can always assume that $a^n + b^n$ fits in a signed 64-bit integer.

Sample Input

```
10 16 2
7 12 3
0 0
```

Sample Output

```
68
91
```