Professors are very motivated when they have to travel abroad for a conference (of course, if fees are paid by the university), but they don't have the same attitude when the moment to grade exams arrives.

Professor Lazy, Ph.D., has a particular way to grade exams (and very unfair, by the way). He puts all his exams in a box and then starts getting them out one by one in a totally random fashion. He assigns grade α to the first exam that he gets out of the box, and grade β to the second exam that he gets out of the box. From that point on, he assigns a grade to each of the exams based on the grades of the previous two exams. What he does is that he takes the grade of the immediately previous exam, adds 1 and divides by the grade of the exam before the previous one.

For example, let's imagine that $\alpha = 2$ and $\beta = 3$. This is what happens:

- The first exam gets $\alpha = 2$.
- The second exam gets $\beta = 3$.
- The previous two grades are α and β, so the third exam gets $\dfrac{(1+\beta)}{\alpha} = \dfrac{(1+3)}{2} = 2$.
- The previous two grades are β and $\dfrac{(1+\beta)}{\alpha}$, so the fourth exam gets $\dfrac{1+\frac{(1+\beta)}{\alpha}}{\beta} = \dfrac{1+2}{3} = 2$.
- The procedure continues until he's done with all exams.

More formally, we can define the grade Q_n of the n-th exam with a recurrence like this:

$$Q_n = \begin{cases} \alpha & \text{if} \quad n = 0 \\ \beta & \text{if} \quad n = 1 \\ \frac{1+Q_{n-1}}{Q_{n-2}} & \text{if} \quad n \geq 2 \end{cases}$$

Even this simple procedure is a lot of work for Professor Lazy, Ph.D., so he asks you to write a program to do it for him. He wants to spend all day long drinking coffee in the cafeteria with other professors. Given α, β and n find the value of Q_n.

Note that the grades do not necessarily lie inside a fixed range. They are just arbitrary integers.

Input

The input contains several test cases (at most 1000). Each test case is described by three integer numbers α, β and n on a single line ($1 \leq \alpha, \beta \leq 10^9$ and $0 \leq n \leq 10^{15}$).

The last line of the input contains three zeros and should not be processed.

Output

For each test case, write the value of Q_n in a single line. The input will be such that the value of Q_n is always an integer. Furthermore, Q_i will never be zero for $0 \leq i \leq n$ (in other words, division by zero will never arise when evaluating the recurrence).

Sample Input

```
1 1 0
1 2 1
5 9 2
2 3 3
7 4 4
2109 650790 344341899059516
45861686 57 594261603792314
2309734 21045930 808597262407955
0 0 0
```

Sample Output

```
1
2
2
1
2
650790
804591
2309734
```