

Little Panda has a thing for powers and modulus and he likes challenges. His friend **Lucy**, however, is impractical and challenges **Panda** to find both positive and negative powers of a number modulo a particular number. We all know that $A^{-1} \bmod X$ refers to the modular inverse of A modulo X (see [Wikipedia](#)).

Since **Lucy** is impractical, she says that $A^{-n} \bmod X = (A^{-1} \bmod X)^n \bmod X$ for $n > 0$.

Now she wants **Panda** to compute $A^B \bmod X$.

She also thinks that this problem can be very difficult if the constraints aren't given properly. **Little Panda** is very confused and leaves the problem to the worthy programmers of the world. Help him in finding the solution.

Input Format

The first line contains T , the number of test cases.
Then T lines follow, each line containing A , B and X .

Output Format

Output the value of $A^B \bmod X$.

Constraints

- $1 \leq T \leq 1000$
- $1 \leq A \leq 10^6$
- $-10^6 \leq B \leq 10^6$
- $1 \leq X \leq 10^6$
- A and X are coprime to each other (see [Wikipedia](#))

Sample Input

```
3
1 2 3
3 4 2
4 -1 5
```

Sample Output

```
1
1
4
```

Explanation

- Case 1: $1^2 \bmod 3 = 1 \bmod 3 = 1$
- Case 2: $3^4 \bmod 2 = 81 \bmod 2 = 1$
- Case 3: $4^{-1} \bmod 5 = 4$