Simple One

HackerRank

You are given the equation $\tan\alpha = \frac{p}{q}$ and a positive integer, n. Calculate $\tan n\alpha$. There are T test cases.

Input Format

The first line contains T, the number of test cases.
The next T lines contain three space separated integers: p, q and n, respectively.

Constraints

$0 \leqslant p \leqslant 10^9$
$1 \leqslant q \leqslant 10^9$
$1 \leqslant n \leqslant 10^9$
$T \leqslant 10^4$

Output Format

If the result is defined, it is always a rational number. However, it can be very big.
Output the answer modulo $(10^9 + 7)$.
If the answer is $\frac{a}{b}$ and b is not divisible by $(10^9 + 7)$, there is a unique integer $0 \leqslant x < 10^9 + 7$ where $a \equiv bx \mod (10^9 + 7)$.
Output this integer, x.
It is guaranteed that b is not divisible by $(10^9 + 7)$ for all test cases.

Sample Input

```
2
2 1 2
5 6 7
```

Sample Output

```
666666670
237627959
```

Explanation

If $\tan\alpha = \frac{2}{1}$ then $\tan 2\alpha = -\frac{4}{3}$ and $-4 \equiv 3 \times 666666670 \mod (10^9 + 7)$.
So, the answer is 666666670.