

Discrete Math Problem (shorten)

Warning: This problem looks like, but differs from [GCD3](#) :

GCD3 : (2^K-2) ---vs--- GCD4 : $(2K-2)$

Moreover, your challenge will be to shorten your code to get more points.

GCD4 could be harder than GCD3!

Input

The first line of input contains an integer T , the number of test cases.

On each of the next T lines, you are given three integers N , M and K such that:

$$N = a + b$$

$$M = a^2 + b^2 - (2K-2) \times a \times b$$

with $a > 0$, $b > 0$ and $\text{gcd}(a, b) = 1$.

Output

For each test case, you have to print $\text{gcd}(N, M)$, the greatest common divisor.

Example

Input:

```
2
2214811 1451126169481 7
107603 9066347749 9
```

Output:

```
1
1
```

Note: For the first trio $a = 117651$ and $b = 2097160$.

For the second $a = 1313$ and $b = 106290$.

Constraints

```
0 < T < 14321
0 < N < 10^200
1 < M < 10^200
0 < K < 17
```

For your information, my 293B C code get AC in 0.03s with 1.6MB of memory print.

Size code limit will be 666B.

Language restrictions are quite the same than in GCD3, and it is justified ;-)

Have fun ;-)