

SPOJ Problem Set (classical)

5084. Discrete Math Problem

Problem code: GCD3

Given N , M and K ($1 \leq N, M \leq 100^{200}$ and $1 \leq K \leq 16$) which

$$N = a + b$$

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

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

Your task is to find $\gcd(N, M)$.

Input

The input file consists of several data sets. The first line contains the number of data sets T ($1 \leq T \leq 10000$). The following T lines describe the data sets, one triple (N, M, K) for each.

Output

For each data test in the input write the $\gcd(N, M)$.

Example

Input: 264857088410466819354133 420644191708310845403065233058235585438328857465 108017723549 59173349743176010825 *Output: 11*Note: For the first trio a = 64857088410466819354126 and b = 7. For the second a = 8016478423 and b = 1245126.

Added by: Frank Rafael Arteaga

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Time limit: 0.100s-0.300s

Source limit: 1000B

Languages: All except: JAVA PYTH 2.6.2 PYTH 2.5 RUBY PIKE PHP LISP sbcl LISP clisp HASK

Resource: Discrete Math