Problem A
Ginkgo Numbers

Input: Standard Input
Time Limit: 30 seconds

We will define Ginkgo numbers and multiplication on Ginkgo numbers.

A *Ginkgo number* is a pair $\langle m, n \rangle$ where m and n are integers. For example, $\langle 1, 1 \rangle$, $\langle -2, 1 \rangle$ and $\langle -3, -1 \rangle$ are Ginkgo numbers.

The multiplication on Ginkgo numbers is defined by $\langle m, n \rangle \cdot \langle x, y \rangle = \langle mx - ny,\ my + nx \rangle$. For example, $\langle 1, 1 \rangle \cdot \langle -2, 1 \rangle = \langle -3, -1 \rangle$.

A Ginkgo number $\langle m, n \rangle$ is called a *divisor* of a Ginkgo number $\langle p, q \rangle$ if there exists a Ginkgo number $\langle x, y \rangle$ such that $\langle m, n \rangle \cdot \langle x, y \rangle = \langle p, q \rangle$.

For any Ginkgo number $\langle m, n \rangle$, Ginkgo numbers $\langle 1, 0 \rangle$, $\langle 0, 1 \rangle$, $\langle -1, 0 \rangle$, $\langle 0, -1 \rangle$, $\langle m, n \rangle$, $\langle -n, m \rangle$, $\langle -m, -n \rangle$ and $\langle n, -m \rangle$ are divisors of $\langle m, n \rangle$. If $m^2 + n^2 > 1$, these Ginkgo numbers are distinct. In other words, any Ginkgo number such that $m^2 + n^2 > 1$ has at least eight divisors.

A Ginkgo number $\langle m, n \rangle$ is called a *prime* if $m^2 + n^2 > 1$ and it has exactly eight divisors. Your mission is to check whether a given Ginkgo number is a prime or not.

The following two facts might be useful to check whether a Ginkgo number is a divisor of another Ginkgo number.

- Suppose $m^2 + n^2 > 0$. Then, $\langle m, n \rangle$ is a divisor of $\langle p, q \rangle$ if and only if the integer $m^2 + n^2$ is a common divisor of $mp + nq$ and $mq - np$.
- If $\langle m, n \rangle \cdot \langle x, y \rangle = \langle p, q \rangle$, then $(m^2 + n^2)(x^2 + y^2) = p^2 + q^2$.

Input

The first line of the input contains a single integer, which is the number of datasets.

The rest of the input is a sequence of datasets. Each dataset is a line containing two integers m and n, separated by a space. They designate the Ginkgo number $\langle m, n \rangle$. You can assume $1 < m^2 + n^2 < 20000$.

Output

For each dataset, output a character '`P`' in a line if the Ginkgo number is a prime. Output a character '`C`' in a line otherwise.

Sample Input

```
8
10 0
0 2
-3 0
4 2
0 -13
-4 1
-2 -1
3 -1
```

Output for the Sample Input

```
C
C
P
C
C
P
P
C
```