

## Problem B: Broken Calculator Keys

### Time Limit: 5 seconds

#### Description

The keys on a calculator is bad broken. Only the 5 keys **sin**, **cos**, **tan**, **asin**, **atan** are still functional. Respectively, they stand for *sine*, *cosine*, *tangent*, *arc-sine*, and *arc-tangent*. Initially the calculator's display shows **0**. Compute the minimum number of key presses, such that the decimal equivalent of the fraction  $p/q$  will appear on the calculator! Please assume that the calculator has infinite precision, and that it uses radians for trig functions.

#### Input

A number of of inputs ( $\leq 40000$ ), each with **p** and **q** ( $0 \leq p \leq 1000$  and  $1 \leq q \leq 1000$ ).

#### Output

Output the answer for each input, one on each line.

#### Sample Input

```
0 1
1 1
1 2
```

#### Sample Output

```
0
1
7
```