

## 13218 Broken Calculator Keys

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 test cases ( $\leq 40000$ ), one per line, each with  $p$  and  $q$  ( $0 \leq p \leq 1000$  and  $1 \leq q \leq 1000$ ).

### Output

Output the answer for each test case, one on each line.

### Sample Input

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

### Sample Output

```
0
1
7
```