CPC '21 Contest 1 P1 - AQT and Fractions

Time limit: 2.0s **Memory limit:** 256M

AQT is studying fractions and he has encountered T problems. In each problem, AQT is given a fraction with a numerator A and a denominator B $(A < B)$. AQT wants to know after converting the fraction to a decimal and removing all terminating zeroes, how many digits there are to the right of the decimal. Can you help AQT answer all T problems?

Constraints

For all subtasks:

$1 \leq T \leq 10^3$

$1 \leq A < B \leq 10^{18}$

Subtask 1 [10%]

$T = 1$

$1 \leq A < B \leq 5$

Subtask 2 [10%]

B is a multiple of 10.

Subtask 3 [30%]

$1 \leq A < B \leq 10^9$

Subtask 4 [50%]

No additional constraints.

Input Specification

The first line contains T, the number of problems you need to help AQT solve.

The next T lines contain A and B, the numerator and the denominator of the fraction, respectively.

Output Specification

For each problem, output the answer to the problem if the answer is finite, or `-1` if the answer is infinite.

Sample Input 1

```
4
1 3
2 5
3 9
1 4
```

Sample Output 1

```
-1
1
-1
2
```

Explanation for Sample 1

For the first test case, $\frac{1}{3} = 0.\overline{3}$.

For the second test case, $\frac{2}{5} = 0.4$.

For the third test case, $\frac{3}{9} = 0.\overline{3}$.

For the fourth test case, $\frac{1}{4} = 0.25$.