

Problem D. Divisible repunit

Source file name: D.c, D.cpp, D.java, D.py2, D.py3
Input: Standard
Output: Standard
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In recreational mathematics, a repunit is a number like 11, 111, or 1111 that contains only the digit 1. The term stands for repeated unit and was coined in 1966 by Albert H. Beiler in his book *Recreations in the Theory of Numbers*.

It is suspected that any number N ending with any of the digits 1, 3, 7 or 9 have at least one multiple that is a repunit, this is, there is at least one repunit R such that the result of dividing R by N has no remainder.

Your task is to help confirm the previous statement. Given a number N that ends with any of the digits 1, 3, 7, or 9 can you find how many digits have the smallest repunit that N can divide?

Input

The first line of input contains a number T , the number of test cases. Each test case is described by a line with a single number N .

- $1 \leq T \leq 10$
- $1 \leq N \leq 10^6$
- It is guaranteed that the last digit of N will be 1, 3, 7 or 9

Output

For each test case print the number of digits that has the minimum repunit that can be divided by N without remainder if such repunit exists, print -1 otherwise.

Example

Input	Output
2	3
3	6
7	