Project Euler #26: Reciprocal cycles

This problem is a programming version of Problem 26 from projecteuler.net

A unit fraction contains 1 in the numerator. The decimal representation of the unit fractions with denominators 2 to 10 are given:

$$\begin{align*} \frac{1}{2} &= 0.5 \\ \frac{1}{3} &= 0.(3) \\ \frac{1}{4} &= 0.25 \\ \frac{1}{5} &= 0.2 \\ \frac{1}{6} &= 0.1(6) \\ \frac{1}{7} &= 0.(142857) \\ \frac{1}{8} &= 0.125 \\ \frac{1}{9} &= 0.(1) \\ \frac{1}{10} &= 0.1 \end{align*}$$

Where $0.1(6)$ means $0.166666...$, and has a 1-digit recurring cycle. It can be seen that $\frac{1}{7}$ has a 6-digit recurring cycle.

Find the value of smallest $d \lt N$ for which $\frac{1}{d}$ contains the longest recurring cycle in its decimal fraction part.

Input Format
The first line contains an integer T , i.e., number of test cases.
Next T lines will contain an integer N.

Output Format
Print the values corresponding to each test case.

Constraints
$1 \le T \le 1000$
$4 \le N \le 10000$

Sample Input

```
2
5
10
```

Sample Output

```
3
7
```