Problem J. Joyful Numbers

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	512 mebibytes

We say that an integer $n \geq 1$ is *joyful* if, by concatenating the digits 25 to the right of n, we get a perfect square. For example, 2 is a joyful number (as $225 = 15^2$) but 3 is not (as 325 is not a perfect square).

Given an integer k such that $1 \leq k \leq 10^9$, count the number of distinct prime factors of the k-th joyful number.

Input

The first line contains one integer t, the number of test cases ($1 \leq t \leq 4 \cdot 10^3$).

Each test case is given on a separate line containing an integer k ($1 \leq k \leq 10^9$).

Output

For each test case, print a line with a single integer: the number of distinct prime factors of the k-th joyful number.

Examples

standard input	standard output
2 1 4	1 2
1 1000000000	7

Note

The first joyful number is 2, which has one distinct prime factor. The fourth joyful number is $20 = 2 \cdot 2 \cdot 5$, which has two distinct prime factors.