Next Semiprime

Time limit: 1.0s   **Memory limit:** 64M

Primes are no longer popular. Semiprimes are now trendy, and everyone wants one.

A semiprime is a number which has two prime factors, which do not need to be distinct. For example, the square of a prime is a semiprime.

The first few semiprimes are 4, 6, 9, 10, 14, 15, 21, 22, 25, 26, 33.

You have $1 \leq Q \leq 5 \cdot 10^4$ friends you want to help out, numbered $1 \ldots Q$. Each friend has a number $1 \leq N_k \leq 10^9$ where $1 \leq k \leq Q$.

For each friend, you are to find the smallest semiprime strictly greater than N_k.

Constraints

Subtask	Q	N	% of points
1	10	10^3	1
2	100	10^4	2
3	100	10^6	4
4	1 000	10^8	8
5	10 000	10^9	15
6	50 000	10^9	70

Input Specification

The first line will contain Q. The next Q lines will contain all N.

Output Specification

The corresponding semiprime for each N, one per line.

Sample Input

```
7
1
5
100
1000000000
100
123456
987654321
```

Sample Output

```
4
6
106
1000000006
106
123458
987654343
```

Explanation

Factor and see for yourself.