Project Euler #221: Alexandrian Integers

This problem is a programming version of Problem 221 from projecteuler.net

We shall call a positive integer A an "Alexandrian integer", if there exist integers p, q, r such that:

$$A = p \cdot q \cdot r \text{ and } \frac{1}{A} = \frac{1}{p} + \frac{1}{q} + \frac{1}{r}$$

For example, 630 is an Alexandrian integer ($p = 5$, $q = -7$, $r = -18$). In fact, 630 is the 6th Alexandrian integer, the first 6 Alexandrian integers being: 6, 42, 120, 156, 420 and 630.

Find the nth Alexandrian integer.

Input Format

First line of each test file contains a single integer q that is the number of queries per test file. q lines follow, each with an integer n.
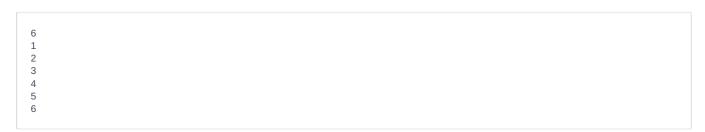
Constraints

- $1 \leq q \leq 1000$
- $1 \leq n \leq 25 \times 10^5$

Output Format

Print exactly q lines with an answer to the corresponding test on each.

Sample Input 0

```
6
1
2
3
4
5
6
```

Sample Output 0

```
6
42
120
156
420
630
```