

Project Euler #127: abc-hits

This problem is a programming version of [Problem 127](#) from [projecteuler.net](#)

The radical of n , $\text{rad}(n)$, is the product of distinct prime factors of n . For example, $504 = 2^3 \times 3^2 \times 7$, so $\text{rad}(504) = 2 \times 3 \times 7 = 42$.

For a real number r , we shall define the triplet of positive integers (a, b, c) to be a r -abc-hit if:

- $\text{gcd}(a, b) = \text{gcd}(a, c) = \text{gcd}(b, c) = 1$
- $a < b$
- $a + b = c$
- $\text{rad}(abc) < c^r$

We will also call a 1 -abc-hit simply an abc-hit.

For example, $(5, 27, 32)$ is an abc-hit, because:

- $\text{gcd}(5, 27) = \text{gcd}(5, 32) = \text{gcd}(27, 32) = 1$
- $5 < 27$
- $5 + 27 = 32$
- $\text{rad}(4320) = 30 < 32^1$

It turns out that abc-hits are quite rare and there are only thirty-one abc-hits for $c < 1000$, with $\sum c = 12523$.

Given r and L , what is $\sum c$ for all r -abc-hits where $c < L$?

Input Format

The first line of input contains T , the number of test cases.

Each test case consists of a line containing two values, the real number r and the integer L , separated by a space.

Constraints

$1 \leq T \leq 10^5$ (Only the last test file has $T = 10^5$ and is worth half the total points. For all the other test files, $1 \leq T \leq 15$)

$0 < r \leq 1.5$ (The input r is written with at most 6 decimal digits behind the decimal point.)

$1 \leq L \leq 10^5$

Output Format

For each test case, output a single line containing a single integer, the answer for that test case.

Sample Input

```
2
1.0 1000
1.5 1000
```

Sample Output

```
12523
424136
```

Explanation

The first test case corresponds to the example given in the problem statement.