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:

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

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

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

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

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

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

$1 \le L \le 10^5$

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.