

# 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.