

Project Euler #132: Large repunit factors

This problem is a programming version of [Problem 132](#) from [projecteuler.net](#)

A number consisting entirely of ones is called a repunit. We shall define $R(k)$ to be a repunit of length k .

For example, $R(10) = 1111111111 = 11 \times 41 \times 271 \times 9091$, and the sum of these prime factors is 9414.

Given a , b and k , find the sum of the first k distinct prime factors of $R(a^b)$.

Input Format

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

Each test case consists of one line containing three space-separated integers, a , b and k .

Constraints

$T \geq 1$
 $10 \leq a \leq 10^8$
 $9 \leq b \leq 10^8$
 $1 \leq k \leq 45$
 a is a multiple of 10

In test cases worth 1/3 of the total points:

$T \leq 600$
 $a^b \leq 10^{15}$

In test cases worth 2/3 of the total points:

$T \leq 600$

In test cases worth 3/3 of the total points:

$T \leq 25000$

Output Format

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

Sample Input

```
1
10 9 2
```

Sample Output

```
28
```

