

It is a little-known story that the young Carl Friedrich Gauss was restless in class, so his teacher came up with a task to keep him preoccupied.

The teacher gave him a series of positive integers $F(1), F(2), \dots, F(K)$. We consider $F(t) = 0$ for $t > K$. Additionally, she has given him a set of lucky numbers and the price of each lucky number. If X is a lucky number, then $C(X)$ denotes its price.

Initially, there's a positive integer A written on the board. In each move, Carl must make one of the following things:

- If number N is currently written on the board, then Carl can write one of its divisors M , smaller than N , instead of N . If he writes the number M , the price of the move is $F(d(N/M))$, where $d(N/M)$ is the number of divisors of the positive integer N/M (including N/M).
- If N is a lucky number, Carl can leave that number on the board, and the price of the move is $C(N)$.

Carl must make **exactly** L moves, and after he has made all of his moves, the number B must be written on the board. Let's denote $G(A, B, L)$ as the minimal price with which Carl can achieve this.

If it is not possible to make L such moves, we define $G(A, B, L) = -1$.

The teacher has given Carl Q queries. In each query, Carl gets numbers A and B and must calculate the value $G(A, B, L_1) + G(A, B, L_2) + \dots + G(A, B, L_M)$, where numbers $L_1, \dots, L_M$ are the same for all queries.

INPUT

The first line of input contains the positive integer K ($1 \leq K \leq 10\,000$).

The second line contains K positive integers $F(1), F(2), \dots, F(K)$ that are less than or equal to $1\,000$.

The following line contains the positive integer M ($1 \leq M \leq 1\,000$).

The following line contains M positive integers $L_1, L_2, \dots, L_M$ that are less than or equal to $10\,000$.

The following line contains the positive integer T , the total number of lucky numbers ($1 \leq T \leq 50$).

Each of the following T lines contains numbers X and $C(X)$ that denote that X is a lucky number, and $C(X)$ is his price ($1 \leq X \leq 1\,000\,000$, $1 \leq C(X) \leq 1\,000$).

Each lucky number appears at most once.

The following line contains the positive integer Q ($1 \leq Q \leq 50\,000$).

Each of the following Q lines contains 2 positive integers A and B ($1 \leq A, B \leq 1\,000\,000$).

OUTPUT

You must output Q lines. The i^{th} line contains the answer to the i^{th} query defined in the task.

SAMPLE TESTS

input

4
1 1 1 1
2
1 2
2
2 5
4 10
1
4 2

output

7

input

3
6 9 4
2
5 7
3
1 1
7 8
6 10
2
6 2
70 68

output

118
-2

input

3
8 3 10
2
8 4
3
1 6
5 1
3 7
2
5 1
3 1

output

16
66

Clarification of the first test case:

$L_1 = 1$, so Carl can make exactly one move - replace number 4 with number 2, so $G(4, 2, 1) = F(d(2)) = 1$.

$L_2 = 2$ so Carl has two options:

- He can replace number 4 with number 2 and then leave number 2 (because it's a lucky number), so he pays the price $F(d(4/2)) + C(2) = 1 + 5 = 6$
- He can leave number 4 in the first move, and replace it in the second move with number 2, so the price is $C(4) + F(d(4/2)) = 10 + 1 = 11$

The first option costs less, so $G(4, 2, 2) = 6$.

The answer to the query is $G(4,2,1) + G(4,2,2) = 7$.