We consider sequences formed from the addition of terms of a given sequence. Let $\{a_n\}$, $n = 1, 2, 3, \ldots$, be an arbitrary sequence of integer numbers; d a positive integer. We construct another sequence $\{b_m\}$, $m = 1, 2, 3, \ldots$, by defining b_m as consisting of $n \times d$ occurrences of the term a_n:

$$b_1 = \underbrace{a_1, \ldots, a_1}_{d \text{ occurrences of } a_1}, b_2 = \underbrace{a_2, \ldots, a_2}_{2d \text{ occurrences of } a_2}, b_3 = \underbrace{a_3, \ldots, a_3}_{3d \text{ occurrences of } a_3}, \cdots$$

For example, if $a_n = n$, and $d = 1$,then the resulting sequence $\{b_m\}$ is:

$$\underbrace{1}_{b_1}, \underbrace{2, 2}_{b_2}, \underbrace{3, 3, 3}_{b_3}, \underbrace{4, 4, 4, 4}_{b_4}, \cdots$$

Given a_n and d we want to obtain the corresponding k-th integer in the sequence $\{b_m\}$. For example, with $a_n = n$ and $d = 1$ we have 3 for $k = 6$; we have 4 for $k = 7$. With $a_n = n$ and $d = 2$, we have 2 for $k = 6$; we have 3 for $k = 7$.

Input

The first line of input contains C $(0 < C < 100)$, the number of test cases that follows.

Each of the C test cases consists of three lines:

1. The first line represents a_n — a polynomial in n of degree i with non-negative integer coefficients in increasing order of the power:

   $$a_n = c_0 + c_1 n + c_2 n^2 + c_3 n^3 + \cdots + c_i n^i$$

   where $c_j \in \mathbb{N}_0$, $j = 0, \ldots, i$. This polynomial a_n is codified by its degree i followed by the coefficients c_j, $j = 0, \ldots, i$. All the numbers are separated by a single space.

2. The second line is the positive integer d.

3. The third line is the positive integer k.

It is assumed that the polynomial a_n is a polynomial of degree less or equal than 20 $(1 \le i \le 20)$ with non-negative integer coefficients less or equal than 10000 $(0 \le c_j \le 10000, j = 0, \ldots, i)$; $1 \le d \le 100000$; $1 \le k \le 1000000$.

Output

The output is a sequence of lines, one for each test case. Each of these lines contains the k-th integer in the sequence $\{b_m\}$ for the corresponding test case. This value is less or equal than $2^{63} - 1$.

Sample Input

```
2
4 3 0 0 0 23
25
100
1 0 1
1
6
```

Sample Output

```
1866
3
```