Lagaan

Problem:

In one of the small towns of India, during the height of the British Raj in the 1800s, the East India Company has imposed high tariffs on people from the local villages. Unable to pay such huge amounts, they gather in the community hall to request the EIC captain, Andrew Russell to decrease their tariffs. Russell, being a cunning officer, hatches a new plan to loot the poor population. He thus proposes a new taxation scheme as follows:

- People have to pay **X** amount of tariff for the first month.
- For next **T1** months, they have to pay one unit more tariff than the previous month.
  So, if they paid **X** unit of tariff in the first month, they have to pay **X+1** tariff next month, for **T1** months.
- For next **T2** months, they pay double the amount of tariffs paid last month, for **T2** months.
- After this time, they have to pay a charge amounting to **product** of tariffs for **K** previous months.

He proposes a very small value for the first month, which makes the villagers very happy. But Bhuvan, a sensible youth of the village sees through Russell's plan at once.
The naïve villagers obviously oppose his pleas to reject the scheme.
Can you help Bhuvan to show the long term mal-consequences to the villagers, by calculating the tariffs for N^{th} month, where **N** may be very large?
Note: Since the value of tariffs may be too large, find the answer modulo $10^9 + 7$

Input:

- The first line contains **T**, the number of test cases.
- Each of the next **T** lines contain the following data: **X T1 T2 K N**

N : The month for which you have to calculate the tariffs.

Output:

For each test case, output the tariff for N^{th} month, modulo $10^9 + 7$, in a new line each.

Constraints:

$1 \leq \mathbf{T} \leq 5$
$1 \leq \mathbf{X}, \mathbf{T1}, \mathbf{T2} \leq 50$
$1 \leq \mathbf{K} \leq \mathbf{T1} + \mathbf{T2} + 1$
$1 \leq \mathbf{N} \leq 10^9$

Example:

Input

```
2
1 5 5 2 5
1 5 5 2 20
```

Output

```
6
75821660
```

Problem Setter:

Valiant1