

Problem I

Oracle

Time limit: 3 seconds

Memory limit: 256 megabytes

Problem Description

Oracle is a concept in computer science that serves as a black box which can solve some sort of problem in a single operation. It is a tool used to study decision problems. The origin of oracle goes back to ancient Greece. The most famous of them is probably Pythia, the oracle of Delphi, priestess to Apollo. Pythia is not the name of one person, but a title given to the oracle of Delphi. They are active and continued to be consulted by Greeks from 7 century BC until the 4th century AD. And Phemonoe, the first oracle of Delphi, possibly the daughter of Apollo himself, is the main character in this problem. Why, you might ask, does this problem not feature a computer scientist whose name started with I? Well we simply cannot find a computer scientist whose name started with I that has anything to do with this problem, so get over it.

Phemonoe is in a series of n games. The games happen sequentially. You cannot go back to play in a previous game that is already done, as time travel is not in the realm of Apollo's powers. She can choose not to participate in a game though. In these games, she can place bets on each of them and receive money that is some multiple of the bet she placed. Usually you shouldn't know the result of each game. But since she is an oracle of Delphi, Apollo already told her what would happen exactly. However, Apollo did warn her to not be too greedy. Being too suspicious and win too much is certainly not a good idea. Zeus might not be so happy if he finds out what Apollo did, you see. Unfortunately, after a few glasses of good quality Greek wine, Phemonoe's judgment is not be as good as she needs it to be. As her confidence grows, she also starts to raise her bets. As her adviser, your job is to maximize her profit. Note that she will not listen to you in terms of the total number of games she wants to play and the amount she is going to bet, but she will listen to your advice as to which games to participate.

Input Format

On the first line, there is a single integer T ($T \leq 20$) indicating the number of test cases. For every test case, the first line will contain a single integer representing the total number of games n ($n \leq 50000$). On the second line, there are n integers p_1, p_2, \dots, p_n , representing the multiplier for each game. Phemonoe's winning of each game will be the product of her bet and the multiplier. Negative multipliers mean losing. For every $i \in \{1, \dots, n\}$, you may assume $|p_i| \leq 50000$. The third line contains two non-negative integers a and b ($a, b \leq 100$), indicating that Phemonoe will bet $j^2 + aj + b$ where $a^2 \geq 4b$ on the j -th game she participates.

Output Format

For every test cases. Output n integers on a line. Representing the maximum profit if Phemonoe decided to participate in $1, 2, \dots, n$ games respectively.

Sample Input

```
2
3
1 2 3
0 0
5
1 -1 1 -1 1
2 2
```

Sample Output

```
3 14 36
5 15 32 38 23
```

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預言者 (Oracle) 是一種計算機科學的概念：一個黑盒子 (不知道內部運作原理的東西)，能夠以單一個操作回答特定問題，主要用於分析決定型問題的計算複雜度。而預言者的起源，可以追溯至古希臘。其中最著名的，可能是德爾菲的預言者皮提亞，太陽神阿波羅的祭司。皮提亞不是一個人的名字，而是德爾菲預言者的稱號。自西元前七世紀至西元四世紀為止，希臘人都向皮提亞求預言、進行諮詢。阿波羅自己的女兒費莫奴 (Phemonoe)，可能是第一個德爾菲的預言者，是這個問題的主角。你可能會問「為什麼這問題沒有用姓 I 的計算機科學家做為主題？」嗯，命題組無法找到一個姓 I 的計算機科學家可以跟這問題扯上關係，請你認命吧。

費莫奴正在一連串 n 場的賭局中。這些賭局依序進行，不能夠回到過去的賭注下注，因為阿波羅的神力無法進行時間旅行。但費莫奴可以選擇不要參加特定賭局。每一場賭局她可以下注，並依據賭局的結果，獲得下注金額倍數的報酬或損失。一般而言，賭客並不會事前知道賭局結果是什麼，可費莫奴是德爾菲的預言者呢！阿波羅早把所有賭局的結果會是什麼了，但也警告費莫奴不要太貪心，可疑的贏了太多並不是好主意。眾神之王宙斯可能會因為阿波羅洩漏結果而感到不快。

不幸的，在幾杯上好希臘紅酒下肚後，費莫奴的判斷力變得不那好了。隨著他的信心增長，他也開始加高他的賭注。作為她的顧問，你的工作是最大化費莫奴的獲利。但要注意的是，他可能不會聽從你的意見太多，他會自己決定要參與賭局的總數，你只能建議她該從所有 n 場賭局中，選出哪些場參加。

Input Format

第一行僅有一個數字 T ($T \leq 20$) 代表有幾組測試資料。每組測試資料的第一行，會有一個正整數 n ($n \leq 50000$) 代表有多少場賭局可以參加。每組測資的第二行會有 n 個 p_1, \dots, p_n 個整數，代表每場賭局的倍率。費莫奴在參加第 i 場時，將可獲得下注金額乘上 p_i 的報酬，負數代表賠錢。你可以假定 $|p_i| \leq 50000$ 對所有的 $i \in \{1, \dots, n\}$ 都成立。每組測試資料的第三行有兩個非負整數 a 和 b ，這將描述費莫奴下注的金額如何隨著信心上升而提昇。費莫奴將會在她參與的第 j 場下注 $j^2 + aj + b$ ，且保證 $a^2 \geq 4b$ 。

Output Format

針對每筆測試資料，輸出 n 個整數，代表費莫奴參與 $1, \dots, n$ 場賭局各自能獲得的最高收益。

Sample Input

```
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Sample Output

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