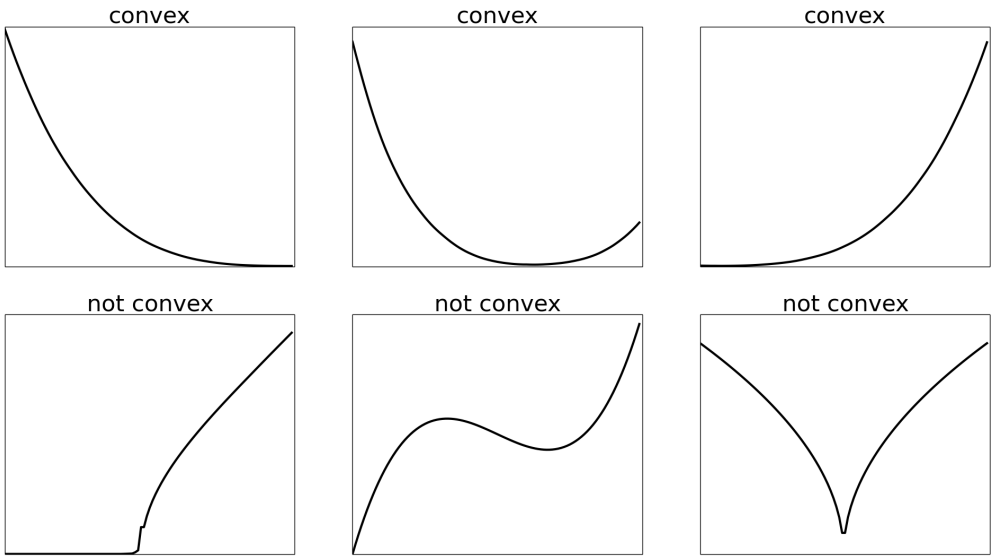
Problem A. Jacked Tickets

Input file:	`jacking.in`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	1024 megabytes

The World Cup is coming soon, everyone is interested in getting tickets, so it became really expensive to get any ticket. There are a lot of thieves who became interested in stealing the tickets of the matches. We would like to reduce the loss of the situation. We decided to partition the n tickets that we have into m non-empty groups, because we have m thieves, who will ruin the match if any of them doesn't get any tickets. Each thief will get exactly one group. This partitioning is done in order to minimize the total loss caused by stealing the n tickets. The total loss of stealing the n tickets is the sum of the loss caused by each thief, given that a thief who gets k tickets will cause a loss of $P(k)$ (for a given convex function P). Given the values $P(1), P(2), \cdots, P(n)$, You need to output the minimum total loss caused by the thieves.



Input

The first line of input contains a single integer $1 \leq T \leq 150$ the number of test cases. Each test case begins with a line containing $N+1$ space separated integers, the first is the maximum number of tickets N followed by N integers, the values of $P(1), P(2), \cdots, P(N)$. The queries then begin with a line containing a single integer Q the number of queries, followed by Q lines each containing two space separated integers n, m; where $1 \leq n, m \leq N \leq 500$, $1 \leq Q \leq 10^4$ and $0 < P(i) \leq 10^{15}$ for all i.

Output

For each test case output a single line displaying the case number, then followed by Q lines, each containing a single integer which is the answer of the corresponding query n, m. The answer to a query n, m is namely the minimum total loss caused by stealing n tickets by m thieves or 'impossible' if it's impossible to save the match from being ruined by some of the thieves.

Example

jacking.in	standard output
2 3 1 1 1 2 3 1 2 1 6 15 12 10 13 19 28 5 1 1 1 4 4 3 4 4 6 6	Case 1: 1 1 Case 2: 15 impossible 42 60 90

Note

- A function f is convex if and only if for all variables x_0, x_1, x_2 such that $x_0 \leq x_1 \leq x_2$ the property $(x_2 - x_1)f(x_0) + (x_1 - x_0)f(x_2) \geq (x_2 - x_0)f(x_1)$ is satisfied, or also equivalently $\lambda f(x_1) + (1 - \lambda)f(x_2) \geq f(\lambda x_1 + (1 - \lambda)x_2)$ is satisfied for $0 \leq \lambda \leq 1$.
- If P and Q are convex functions, then $P + Q$ is also convex, where $(P + Q)(x) = P(x) + Q(x)$.