

Problem I. Yet Another Promotion

Time limit 1000 ms

Mem limit 262144 kB

The famous store "Second Food" sells groceries only two days a month. And the prices in each of days differ. You wanted to buy n kilos of potatoes for a month. You know that on the first day of the month 1 kilo of potatoes costs a coins, and on the second day b coins. In "Second Food" you can buy any **integer** kilograms of potatoes.

Fortunately, "Second Food" has announced a promotion for potatoes, which is valid only on the first day of the month — for each m kilos of potatoes you buy, you get 1 kilo as a gift! In other words, you can get $m + 1$ kilograms by paying for m kilograms.

Find the minimum number of coins that you have to spend to buy **at least** n kilos of potatoes.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10\,000$). Description of the test cases follows.

The first line of each test case contains two integers a and b ($1 \leq a, b \leq 10^9$) — the prices of 1 kilo of potatoes on the first and second days, respectively.

The second line contains two integers n and m ($1 \leq n, m \leq 10^9$) — the required amount of potatoes to buy and the amount of potatoes to use the promotion.

Output

For each test case print one integer — the minimum number of coins that you have to pay to buy at least n kilos of potatoes.

Examples

Input	Output
5 5 4 3 1 5 4 3 2 3 4 3 5 20 15 10 2 1000000000 9000000000 1000000000 8	9 10 9 135 8888888889000000000

Note

In the first test case, on the first day you buy 1 kilo and get 1 more for a promotion. On the second day, you can buy 1 kilo of potatoes. Thus, you will spend $5 + 4 = 9$ coins in total.

In the second test case, on the first day you buy 2 kilo and get another 1 more for a promotion. This way you will spend $2 \cdot 5 = 10$ coins.