



BITWISE 2011



Abducted!!! (Points: 100)

Mr. Bean goes to a science fair. Being inherently clumsy, he seems to be an easy catch to a mad scientist who abducts him and takes him to his lab. There he is conducting an experiment with chemicals X and Y . These chemicals react with each other to give a compound Z . Chemicals X and Y are commercially available in packets of standard quantity, where each packet of X costs g rupees and each packet of Y costs h rupees. The compound Z produced can be sold at b rupees per packet. X and Y can combine in any proportion to give Z . The number of packets of Z produced is proportional to both the number of packets of X and Y used. One packet of X and one packet of Y produce one packet of Z .

X and Y have impurities which when subjected to the experimental conditions react among themselves to give compounds P and Q respectively. P has commercial value of a per packet and Q has a value of c per packet. The number of packets of P produced is proportional to the square of the number of packets of X used and one packet of X produces one packet of P . Similarly the number of packets of Q produced is proportional to the square of the number of packets of Y used and one packet of Y produces one packet of Q . In this chemical reaction some inert particles get left behind which have value of d and e rupees per packet of X and Y respectively.

The scientist has a total of j rupees for the experiment. Being a greedy person, he wants to maximize his profit. Unfortunately, he is not very good at Maths and wants Mr. Bean to help him solve this problem in return for being set free. Help Mr. Bean escape the clutches of the evil scientist.

Input Format:

The first line contains the number of test cases T . For each test case we will have one line with eight integers a, b, c, d, e, g, h and j separated by a space each. The symbols are as explained in the question.

Limits: $1 \leq T \leq 100000$, $1 \leq a, b, c, d, e \leq 100$, $1 \leq g, h \leq 300$, $1 \leq j \leq 100000$.

Output Format:

For each test case, output one integer giving the maximum money that the scientist can get from selling his products (do not subtract his investment in the experiment). You can assume all answers and intermediate values fit in `long long int` (64 bits).

Sample Input:

```
2
1 0 0 1 0 1 1 10
64 54 50 8 20 100 68 711
```

Sample Output:

110

5200

Instructions

- Your program should not print anything other than what is specified in the output format. A program with extraneous output (even a single space) will be treated as incorrect!
- While submitting your code, please select the language carefully *gcc/g++*. Using the wrong language will lead to compiler error.
- The only input/output functions allowed are `printf`, `scanf`, `cin`, `cout`. Perform all read/write operations through `stdin/stdout`. The solutions will be checked using command line redirection only.

Problem Setter: *Anshul, Dheeraj & Naveen*