Problem D. Plants vs. Zombies (Sunflower Edition)

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

Alice has recently become fascinated with Plants vs. Zombies (Sunflower Edition).

There are **two** types of sunflowers: the i-th type requires p_i sun to plant and generates q_i sun per round.

Initially, you have s sun.

At the beginning of each round, you can buy and plant **each type** of sunflower **at most once**. At the end of each round, you will get all the sun generated by your sunflowers planted in this and previous rounds.

Assuming you can plant an unlimited number of sunflowers, calculate the maximum amount of sun you can have after n rounds.

Input

The first line contains two integers s and n ($1 \le s, n \le 2 \times 10^7$), representing the initial amount of sun you have and the number of rounds the game will be played.

The second line contains two integers p_1 and q_1 ($1 \le p_1, q_1 \le 1023$), describing the attributes of the first type of sunflower.

The third line contains two integers p_2 and q_2 ($1 \le p_2, q_2 \le 1023$), describing the attributes of the second type of sunflower.

Output

Output a single integer, which is the maximum amount of sun you can have after n rounds.

Examples

standard input	standard output
75 3 50 25 25 15	125
50 4 25 15 50 25	125

Note

In the first sample test case, Alice starts with 75 sun and has 3 rounds to plant sunflowers. Here is the optimal strategy:

- In the first round, spend $50 + 25 = 75$ sun to plant both types of sunflowers. At the end of the round, $25 + 15 = 40$ sun would be generated.
- In the second round, spend 25 sun to plant the second type of sunflower and keep $40 - 25 = 15$ sun. At the end of the round, $25 + 15 + 15 = 55$ sun would be generated, and your sun would increase to $15 + 55 = 70$.
- In the third round, do not buy new sunflowers. After collecting 55 sun for this round, you would have $70 + 55 = 125$ sun.