Fast Mod

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Little Cyan Fish was learning an algorithmic lecture at the National Olympiad in Fishing Winter Camp (WC). In the lecture, a mysterious lecturer talked about the Barrett reduction, which is a reduction algorithm introduced in 1986 by P.D. Barrett.

To check if you understand how the algorithm works, Little Cyan Fish gives you a special number, M. Then, the mysterious lecturer defines the sequence $\{X\}, \{Y\}$ as follows:

$$X_n = (\alpha \cdot X_{n-1} + X_{n-2} \cdot Y_{n-1}) \bmod M, n \geq 2$$

$$Y_n = (\beta \cdot Y_{n-1} + Y_{n-2} \cdot X_{n-1}) \bmod M, n \geq 2$$

Now, Little Cyan Fish gives you the value of α, β, X_0, Y_0, X_1, Y_1, M and N. Your task is to calculate the value of $\sum_{i=2}^{N} X_i$ modulo M.

Input

The first line of the input contains five integers α, β, X_0, Y_0, X_1, Y_1, N, and M ($0 \leq X_0, Y_0, X_1, Y_1, \alpha, \beta < M$, $2 \leq M \leq 10^9$, $2 \leq N \leq 10^8$).

Output

Output a single line contains a single integer, indicating the answer.

Example

standard input	standard output
114 514 1919 810 2024 112 154 12345678	10095098