
Powers of a matrix**P61833_en**

Given a 2×2 matrix M of natural numbers, a natural number n and a natural number m , compute M^n . To avoid overflows, compute every element of $M^n \bmod m$.

Input

Input consists of several cases, each with M_{11} , M_{12} , M_{21} and M_{22} in this order, followed by n and m . Assume that the elements of M are not larger than 500, $0 \leq n \leq 10^9$, and $2 \leq m \leq 1000$.

Output

For every case, print the elements of $M^n \bmod m$ in two lines following the format of the sample. Print a line with 10 dashes after every matrix.

Sample input

```
2 7
1 4
2 100

2 7
1 4
2 5

15 2
3 4
0 1000

500 499
499 498
123456789 1000
```

Sample output

```
11 42
6 23
-----
1 2
1 3
-----
1 0
0 1
-----
792 815
815 422
-----
```

Problem information

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