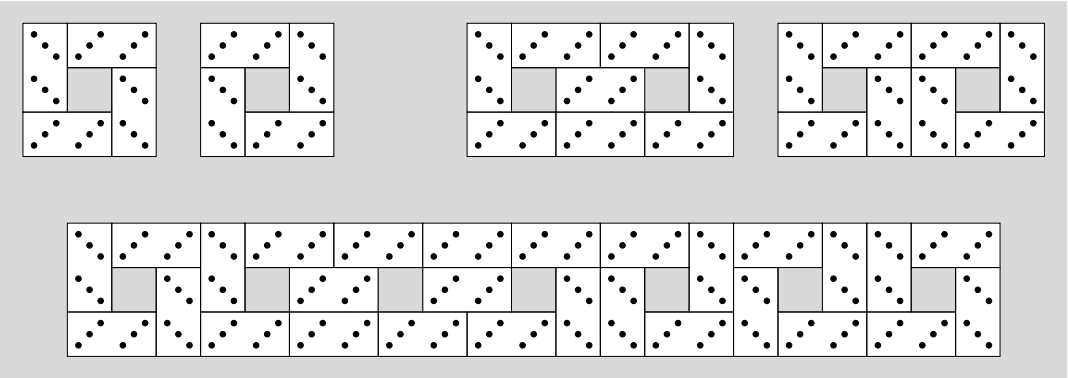
Domino rectangles P87164_en

You have $4n$ identical 3-3 domino pieces, and you must cover with them a $3 \times 3n$ rectangle. As you can see in the picture below, the positions $(2,2), (2,5), \ldots, (2,3n-1)$ of the rectangle must be left empty. Depending on n, how many different rectangles are possible?

For instance, these are the two only possible rectangles for $n = 1$, two of the six possible rectangles for $n = 2$, and a possible rectangle for $n = 7$:



Input

Input consists of several cases, each with two integer numbers n and m. You can assume $0 \leq n \leq 10^{12}$ and $2 \leq m \leq 10^6$.

Output

For every case, print the number of $3 \times 3n$ rectangles modulo m.

Sample input 1

```
0 1000
1 1000
2 1000
2 4
7 127
1000000000000 998877
```

Sample output 1

```
1
2
6
2
61
751275
```

Problem information

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