## Domino rectangles   P87164_en

Cinquè Concurs de Programació de la UPC - Final (2007-10-03)

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 $n = 7$:
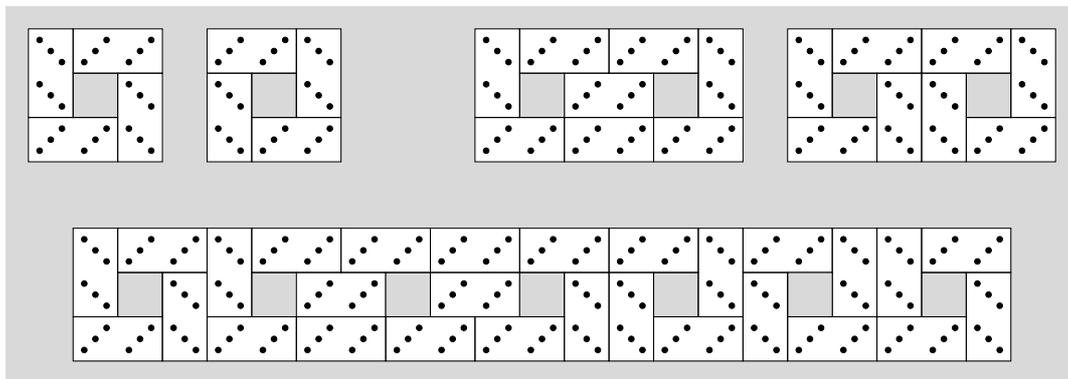
Input

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

Output

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

Sample input	Sample output
0 1000	1
1 1000	2
2 1000	6
2 4	2
7 127	61
1000000000000 998877	751275

Problem information

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