CALCULATE POW(2004,X) MOD 29

Consider a positive integer X,and let S be the sum of all positive integer divisors of 2004^X .
Your job is to determine S modulo 29 (the rest of the division of S by 29).

Take X = 1 for an example. The positive integer divisors of 2004^1 are 1, 2, 3, 4, 6, 12, 167, 334,
501, 668, 1002 and 2004. Therefore S = 4704 and S modulo 29 is equal to 6.

Input

The input consists of several test cases. Each test case contains a line with the integer X (1 <= X
<= 10000000). A test case of X = 0 indicates the end of input, and should not be processed.

Output

For each test case, in a separate line, please output the result of S modulo 29.

Sample

Input:
1
10000
0

Output:
6
10