GCD Product Sum

In this problem, you will be given q queries ($1 \le q \le 1\,000\,000$). Each query will contain a single integer n ($1 \le n \le 1\,000\,000$).

For each query you have to output the following:

$$\sum_{i=1}^{i=n} i * \gcd(i, n)$$

Input

First line will contain the number of queries q. Next q lines will contain a single integer n.

Output

Output the answer for each query in a new line.

Example

Input:
4
4
6
7
9

Output:
24
63
70
135

Explanation:

For second query ($n=6$):

1*gcd(1,6)+2*gcd(2,6)+3*gcd(3,6)+4*gcd(4,6)+5*gcd(5,6)+6*gcd(6,6)

1*1+2*2+3*3+4*2+5*1+6*6

1+4+9+8+5+36=63