# Ada and Homework

Ada the Ladybug came home with difficult homework. Since she is very skilled mathematician, she already deduced, how to count the answer for N. Consider all numbers **K**(in range **2 ≤ K ≤ N**), for which it is true that *gcd(N,K)==1* and add *gcd(N,K-1)* to sum. What is the sum?

A little bit more formally, find: $\sum$ gcd(K-1,N), for K $\in$ [2,N] where gcd(N,K)==1

Anyway the numbers are too large, so she can't do that without your help. Can you help her?

## Input

The first line contains **1 ≤ T ≤ 1000** , number of test-cases.

Each of following **T** lines contains **2 ≤ N ≤ $10^{18}$**, number for which ada wants the answer.

## Output

For each test case, print the sum of deduced formula.

## Example Input

```
11
2
5
6
7
8
10
50
100
1000
524288
945406969379503350
```

## Example Output

```
0
3
2
5
8
6
70
260
5400
4718592
138196697539905983 3610
```