

1336 – Sigma Function

Sigma function is an interesting function in Number Theory. It is denoted by the Greek letter Sigma (σ). This function actually denotes the sum of all divisors of a number. For example $\sigma(24) = 1+2+3+4+6+8+12+24=60$. Sigma of small numbers is easy to find but for large numbers it is very difficult to find in a straight forward way. But mathematicians have discovered a formula to find sigma. If the prime power decomposition of an integer is

$$n = p_1^{e_1} * p_2^{e_2} * \dots * p_k^{e_k}$$

Then we can write,

$$\sigma(n) = \frac{p_1^{e_1+1} - 1}{p_1 - 1} * \frac{p_2^{e_2+1} - 1}{p_2 - 1} * \dots * \frac{p_k^{e_k+1} - 1}{p_k - 1}$$

For some **n** the value of $\sigma(\mathbf{n})$ is odd and for others it is even. Given a value **n**, you will have to find how many integers from **1** to **n** have **even** value of σ .

Input

Input starts with an integer **T** (≤ 100), denoting the number of test cases.

Each case starts with a line containing an integer **n** ($1 \leq n \leq 10^{12}$).

Output

For each case, print the case number and the result.

Sample Input	Output for Sample Input
4	Case 1: 1
3	Case 2: 5
10	Case 3: 83
100	Case 4: 947
1000	