Problem H. Candies for Nephews

Time Limit 1000 ms
Mem Limit 262144 kB

Monocarp has **three nephews**. New Year is coming, and Monocarp has n candies that he will gift to his nephews.

To ensure that none of the nephews feels left out, Monokarp wants to give each of the three nephews **the same number of candies**.

Determine the **minimum number of candies** that Monocarp needs to buy additionally so that he can give each of the three nephews the same number of candies. Note that all n candies that Monocarp initially has will be given to the nephews.

Input

The first line contains an integer t ($1 \le t \le 100$) — the number of test cases.

Each test case consists of one line containing one integer n ($1 \le n \le 100$) — the number of candies that Monocarp initially has.

Output

For each test case, print one integer — the minimum number of candies that Monocarp needs to buy additionally so that he can give each of the three nephews the same number of candies.

Examples

Input	Output
2 7 24	2 0

Note

In the first example, Monocarp needs to buy 2 candies. After that, he will have 9 candies, and he can give each of the three nephews 3 candies.

In the second example, Monocarp does not need to buy any candies, as he initially has 24 candies, and he can give each of the three nephews 8 candies.