A. Phoenix and Balance

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Phoenix has n coins with weights $2^1, 2^2, \ldots, 2^n$. He knows that n is even.

He wants to split the coins into two piles such that each pile has exactly $\frac{n}{2}$ coins and the difference of weights between the two piles is **minimized**. Formally, let a denote the sum of weights in the first pile, and b denote the sum of weights in the second pile. Help Phoenix minimize $|a-b|$, the absolute value of $a-b$.

Input

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

The first line of each test case contains an integer n ($2 \le n \le 30$; n is even) — the number of coins that Phoenix has.

Output

For each test case, output one integer — the minimum possible difference of weights between the two piles.

Example

input
2 2 4
output
2 6

Note

In the first test case, Phoenix has two coins with weights 2 and 4. No matter how he divides the coins, the difference will be $4-2=2$.

In the second test case, Phoenix has four coins of weight 2, 4, 8, and 16. It is optimal for Phoenix to place coins with weights 2 and 16 in one pile, and coins with weights 4 and 8 in another pile. The difference is $(2+16)-(4+8)=6$.