Tower Of Hanoi - Revisited

Given 3 three pegs: leftmost peg A, middle peg B and rightmost peg C.Find the shortest sequence of moves that transfers a tower of n disks from the left peg A to the right peg C, if direct moves between A and C are disallowed. (Each move must be to or from the middle peg B.)

Constraints:
1. Initially the left peg A in stacked by n disks in the order of decreasing size.
2. Only one move cand be done at a time and never moving a larger one onto a smaller.
3. Number of moves will always be less than 2^64.
4. 1 <= n <= 35

Input

Input begins with a integer t, followed by t lines. Each line has the no. of pegs n.

Output

For each test case, output the minimum no. of move required to transfer the n disks from peg A to peg C.

Example

Input:
4
1
2
5
10

Output:
2
8
242
59048