

Progressions

Charan is good at Mathematics and he loves the concept of progressions. He was assigned a task to calculate the

n -th term in the given series. As he is good at mathematics he calculates the answer but as the series was too large he decided to write a program to solve that problem. Help Mr.Charan in solving the problem.

Given series is $t_1=1, t_2=9, t_3=45, t_4=189, t_5=729, \dots$

Here, $t_n=n$ -th term in the series.

Input

First line represents the number of test cases.

Next t lines represent the n value.

$1 \leq t_n < 10^{18}$

Output

Output the corresponding value of the n -th term

Example

Input:

1
10

Output:

373977