

Xavier's Fight

Professor X has declared a fight against Magneto. He is gathering all his X-Men. But he doesn't want to risk anyone's life. That's why rather than sending alone, he has decided to send each one of them in a group of 3 members. To select a group he is following a simple rule. A group will consist of 3 members with same unit of power. The total power of each group will be the **product** of all of their powers.

Now there are $3 \cdot N$ X-Men. Power of all the members of i th ($1 \leq i \leq N$) group is i .

Given N , our task is to determine what will be sum of powers for all group. Sum can be very large that's why you need to print the square root of sum.

Input

First line of input is T ($1 \leq T \leq 10000$). Next T lines will contain an integer N ($1 \leq N \leq 1000000000$).

Output

For each case there will be a single number which is the square root for sum of N groups' total power. Output should be rounded to **3 digits after decimal point**.

Example

Input:

1
2

Output:

3.000