Kevin and Expected Value

Kevinsogo is a professor of mathematics, One day he gave an assignment to his students which was hard for them. The students want you to help them in solving the problem.

Given the value of N,

$$x = \text{rand}() \bmod N$$

$$Y = \sqrt{x + \sqrt{x + \sqrt{x + \sqrt{x + \cdots}}}}$$

Note that $\text{rand}()$ returns an integer between 0 and 10^{100} (inclusive) uniformly at random.

Find out the expected value of Y.

Input Format
The first line contains an integer T i.e. the number of test cases.
The next T lines will each contain an integer N.

Output Format
Print the output corresponding to each test case in a separate line. The answer will be considered correct if its absolute error doesn't exceed 10^{-3} or 0.001.

Constraints
Task 1: 30 points
$1 \leq T \leq 10000$
$1 \leq N \leq 5 \times 10^6$

Task 2: 10 additional points
$1 \leq T \leq 1000$
$1 \leq N \leq 10^{16}$

Sample Input

```
3
1
5
10
```

Sample Output

```
0.0
1.69647248786
2.43798952788
```