Problem C. Wandering

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

Rikka is a talented student.

She likes to wander in the corridor while solving ICPC problems. Specifically, she will do a random walk for n steps. In the i-th random step, she will choose one of the vectors (x, y) such that $x, y \in \mathbb{R}$ and $x^2 + y^2 \le R_i^2$ with equal probability. And then she will walk along the vector. In other words, if she stood at (A, B) before the random step, she will stand at $(A + x, B + y)$ afterwards. Before wandering, she stands at the door $(0, 0)$.

After wandering, she was curious about the expectation of the square of Euclidean distance to point $(0, 0)$. In other words, she wants to know the expected value of $x^2 + y^2$, if she stands at (x, y) after all n random steps.

Input

The first line contains an integer n, the number of random steps.

The second line contains n positive integers R_i, the parameter of the i-th random step.

It is guaranteed that $1 \le n \le 50\,000$ and $1 \le R_i \le 1000$.

Output

You need to output d, the expected value of $x^2 + y^2$. Assuming the correct result is d^*, you need to ensure that $\frac{|d - d^*|}{\max\{d^*, 1\}} \le 10^{-6}$.

Example

standard input	standard output
3 1 2 3	7.000000000000000