

REAL ROOTS

Anurag is not so good at probability,infact he tends to avoid any probability questions.Bhavik being his friend knows this and also knows that Anurag is excellent with quadratic equations.

In order to help he gives Anurag a quadratic equation of the form $x^2+2*b*x+c=0$ and asks him to find the probability that the given equation has real roots.

To make this question non-trivial he gives Anurag,side of the square centered at origin assuming values of b and c will not go outside that square given.

Help Anurag to find the probability?

Input

First line contains a number of test cases $T(<25)$.Next T lines contain the side of the square $S(<=1000000)$.

Output

Output the required probability in new line for each case upto 6 decimal places.

Example

Input:

1

8

Output:

0.833333