Distance on a square lattice

Let L to be an *nXn* square lattice, you can consider its points as *(x,y)*, where *x* and *y* are integers from the [1,*n*] interval. And let f(*n*) to be the expected distance between two not neccesserily distinct points on the lattice. For example f(1)=0 and f(2)=(2 + $\sqrt{2}$)/4.

Input

There is no input.

Output

5000 lines, on the n-th line give the value of f(*n*) by 2 digits after the decimal point.

Example

Input:
No input.

Output:
0.00
0.85
1.45
2.01
2.55
.
.
.
2607.03