

In Calculus, the [Leibniz formula for \$\pi\$](#) is given by:

$$1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \dots = \frac{\pi}{4}.$$

or:

$$\arctan x = x - \frac{x^3}{3} + \frac{x^5}{5} - \frac{x^7}{7} + \dots$$

You will be given an integer n . Your task is to print the summation of the Leibniz formula up to the n^{th} term of the series correct to 15 decimal places.

Input Format

The first line contains the number of test cases (T) which is less than 100. Each additional line is a test case for a positive integer value (p) less than 10^7 .

Sample Input

2
10
20

Output Format

Output T lines, with each line containing the summation up to n^{th} term.

 Summation

Sample Output

0.760459904732351
0.772905951666960

Scoring

This is a [code golf](#) question. The goal is to write a solution with as little code as possible. A correct submission with a source code of X characters will receive the following score:

$$\text{maxScore} * (300 - X) / 300$$

Any correct code longer than 300 characters will receive a score of $\text{maxScore} * 0.001$.

MaxScore is the maximum score attainable for the problem.

Note that whitespace is also treated as a character.