Exam1_A4-2: Approximation of π

Objective: **Loop**

The value of π (pi) can be approximated using the Leibniz formula, which defines π as an infinite series:

$$\frac{\pi}{4} \approx 1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \frac{1}{9} - \cdots = \sum_{k=0}^{n\to\infty} \frac{(-1)^k}{2k+1}$$

Write a Python program to calculate the approximated value of pi using the first ***n*** terms

INPUT

An integer number as ***n***

OUTPUT

Approximated value of pi using the first ***n*** terms using `round(value, 16)`

EXAMPLES

Input (from keyboard)	Output (on screen)	Explanation
-1	0.0	No summation calculated
0	0.0	No summation calculated
1	4.0	4(1)
2	2.666666666666667	4(1-1/3)
10	3.0418396189294032	4(1-1/3+1/5-….-1/19)
20	3.09162380666784	
101	3.1514934010709914	
9999	3.1416926635905345	

TESTCASES in Grader

Testcases will be grouped. Each group has the following criteria:

Testcases quantity	Test case characteristics
10%	`n < 5`
30%	`5 <= n < 20`
30%	`20 <= n < 200`
30%	`n >= 200`