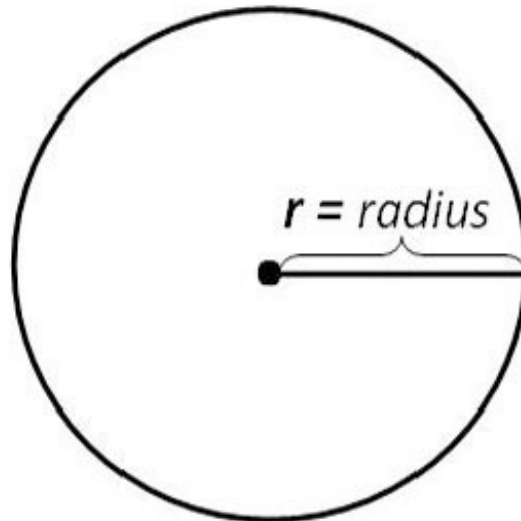


Geometric circle



Enter the radius of the circle. Calculate the *perimeter* and *area* of the circle.

Input

The first line of the input consist of a single integer number t which determines the number of tests.

In each of next t lines will contain the value of radius.

Constraints

- $0 < t \leq 1\,000$

Output

For each test case print out *perimeter* and *area* that separated by a space. Separate your answers with a new line character.

Example

Input:

5
5
-2
1
0
4

Output:

31.415927 78.539816
the radius must be greater than 0
6.283185 3.141593
the radius must be greater than 0
25.132741 50.265482