1. Write a python file "circle.py" with a program to compute an area of a circle, given its radius. The program should read the circle radius from a standard input, and write the area to a standard output. The code that actually computes the area should be encapsulated in a function "compute_area". The code to read input, compute the area, and print the result should be wrapped into a "main" function.

2. Create a test-case for the encapsulated function, along with several test methods. Write at least three different tests, providing a random valid input ("test_valid_input"), random invalid input ("test_invalid_input"), and a boundary condition ("test_boundary").

3. Use the "unittest" Python package from the command-line to run all of the tests, or each individual test, or tests matching a regex.

4. Create a test-case for the "main" function, that would test both how the circle area is computed and how the program interacts with the console.
   Note: you need to emulate console IO. To this end, use the "setUp/tearDown" instance methods in the "unittest.TestCase" class to substitute "sys.stdin" and "sys.stdout" for "StringIO" objects. The rest of the test case should

5. Modify the test-case for the "main" function using "unittest.mock" package. Put the invocation of the "main" function into "unittest.mock.patch" context manager to manage mocking of the standard input and standard output.