CS1020 Take-home Lab #0
Exercise #1: Area of Triangle
http://www.comp.nus.edu.sg/~cs1020/3_ca/labs.html

Objectives:
1. Input/output in Java
2. Using Math class
3. Writing user-defined methods

Task statement:
Write a program AreaOfTriangle.java to read 3 positive real numbers $a$, $b$, and $c$ which are the lengths of a triangle, and compute the area of the triangle using the Heron’s formula:

$$area = \sqrt{p(p-a)(p-b)(p-c)}$$

where $p$ is half the perimeter, i.e. $p = (a + b + c) / 2$.

You are to use double type for the values. The output is the area displayed in 2 decimal places.

You may assume that the input data are positive values.

For modularity, you are to define a class method area(double, double, double) that takes in the lengths (positive values) and returns the computed area, and a class method validTriangle(double, double, double) that returns true if the 3 parameters can possibly represent the lengths of 3 sides of a triangle, or false if it is impossible (see the third sample run below), in which case the program should display “Invalid triangle!” in the output.

(How do you determine that given 3 lengths, they can form a triangle? Discuss this on the IVLE forum if you need help.)

Sample runs:
Enter 3 lengths: 12.5 7.8 19.2
Area = 30.68

Enter 3 lengths: 876.23 255.71 709.76
Area = 75953.81

Enter 3 lengths: 10 50 30
Invalid triangle!