Assignment 8

Exercise 1 (5pt)

Implement the class **Circle**. The class should contain:

- The `x,y` position
- The `radius`

- An empty constructor that initialises the circle at 0,0 with radius 1
- A constructor that takes the 3 fields

- The getters and setters for all fields
- A method `contains(x,y)` that checks if a point is inside the circle
- A method `contains(circle)` that checks if the circle is inside this circle
- A method `intersects(circle)` that checks if the circle is intersects this circle

Use the distance from the centres (point) and compare it with the radius to check. The distance between two points x_1, y_1 and x_2, y_2 is computed with $\text{sqrt}((x_1 - x_2)^2+(y_1 - y_2)^2)$

Exercise 2 (8pt)

Draw the **UML diagram** and **implement** the class **RegularPolygon**. The class should contain:

- The number of sides (default 3)
- The length of each side (default 1)
- The x, y coordinates of the centre of the polygon (default 0,0)

- An empty constructor that initialises the fields by default.
- A constructor that initialises the polygon with a given number of sides of a certain length
- A constructor with all fields

- Getters, and setters for all fields
- A method `getPerimeter` that returns the perimeter of the polygon
- A method `getArea` that returns the area of the polygon, the formula is

  $A = (n\_sides\ side\_length^2) / (4\tan(pi/n\_sides))$

Instructions

The solution of the exercises must be provides as a **java** (for the code, do not submit class files), **png** (for eventual screenshot), and **pdf** (for eventual text) files. The **files must be zipped** together before upload.

Assignments not respecting these instructions will be ignored.