

EECS 118
Knowledge Engineering and Software Engineering
Fall 2018

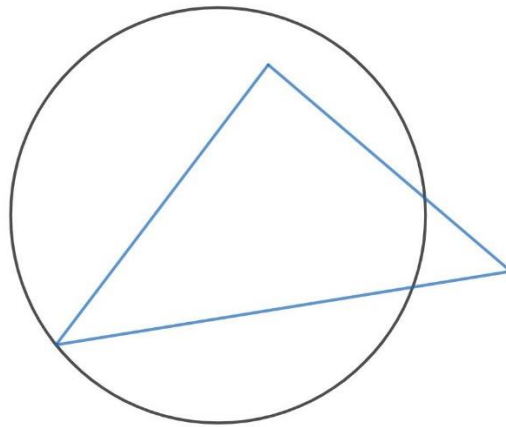
Term Project
Option II: A Geometry Problem Solver
Project Supplement
Problem Set R

You are required to create a separate solver for each one of the following problems. Please use Python 3.5 or above as your programming language for the solver program.

Assigned Problems:

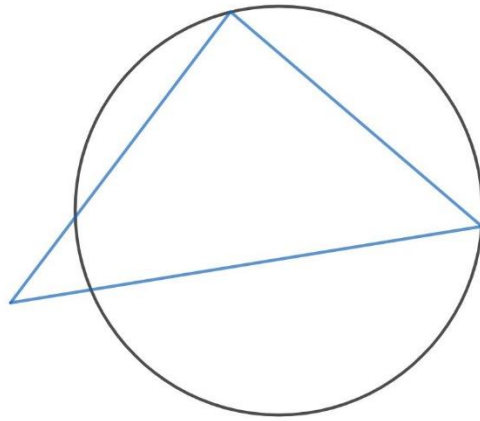
1. A triangle and a circle have three intersection points:

One intersection is on a vertex of the triangle, another intersection is on the adjacent side of the vertex, the third intersection is on opposite side of the vertex.

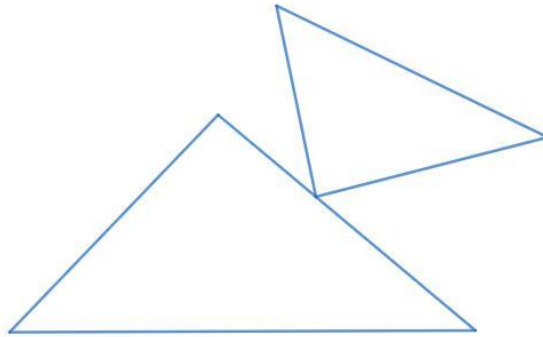


2. A triangle and a circle have four intersection points:

Two intersections are two vertices of the triangle, two other intersections are on two sides.



3. Two triangles have one intersection point:
The intersection can be on a side or a vertex.



You are encouraged to draw your own diagrams according to the description. The diagrams above are only for your reference, you need to consider all cases as long as they meet the description. Please also consider boundary cases.

Extra Credits:

Instead of creating solvers for the above problems, design a solver that can solve any one circle and one triangle problems.

Resources:

[Learn Python in 60 Minutes from Java](#)

[How to solve a triangle](#): You can start here.

[Review on Circles](#): In case you need a review on circles.

[Law of Sines--Ambiguous Case](#): A special case.

[Single Triangle Calculator](#): An online demo of single triangle problem solver.

[SymPy Geometry Module](#): SymPy is a Python library, you may find its geometry module helpful.