1. **An isosceles trapezoid** is one where the two non-parallel sides are equal in length. That is, if AD and BC are parallel, then AB and CD are equal in length. It also follows that the two base angles, \( \angle BAD \) and \( \angle CDA \), are equal to each other (which is also true for other base angles \( \angle ABC \) and \( \angle BCD \)), a fact you may freely use. (See Course web links for a proof.

Prove that any isosceles trapezoid can be inscribed in a circle. Do this by finding a unique point 0 which is equidistant from points A, B, C, and D. (Note – in the diagram above do NOT assume BC equals AB and CD.)

Write up the “proof” on how to construct this circle.

Warning! Do not assume that the perpendicular bisectors of AB, BC, and CD all meet at a single point! Obviously any two perpendicular bisectors would meet but you cannot assume all three would meet at the same point. That would make the proof trivial!

Note: The particular isosceles trapezoid with sides in ratio 1:1:1:1: \( \sqrt{3} \) given above is the basis for the 2nd quadrable lune.

Your write up will be graded on clarity, neatness and of course correctness. It’s strongly suggested that you use the proof that the perpendicular bisectors of a triangle meet at a common point as a model for your write up (see attached handout).

Write up your proof in pencil; do not use scrap paper.

Staple this assignment sheet as a cover for your write up.