

Math 372 Exam 3 Total pages: 3 Total points: 40
Instructor: Yi Wang

Name(Print)_____ Section _____ Grade_____

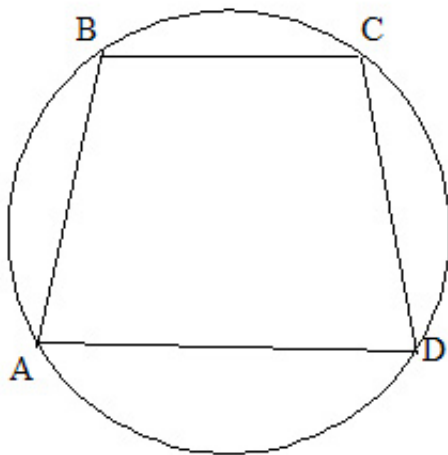
Attention: **Answers without supporting work shown on the paper will receive NO credits.**

Instruction: Please answer Problems 1-5 within the context of absolute geometry. Problem 6-8 can be answered within the Euclidean geometry.

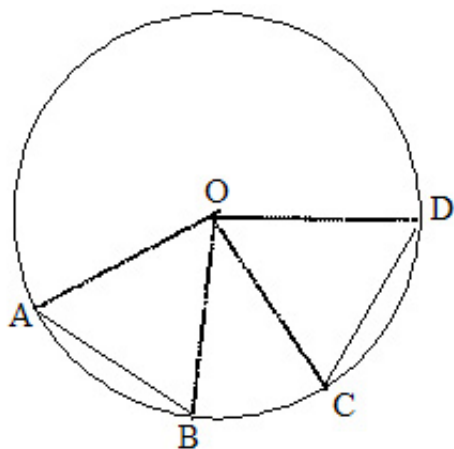
1. Prove that if I is any point on the bisector \overline{BD} of $\angle ABC$, then I is equidistant from its sides, and conversely.

2. Prove that the angle bisectors of any triangle are concurrent at a point I , called the **incenter**, that is equidistant from the three sides of the triangle.

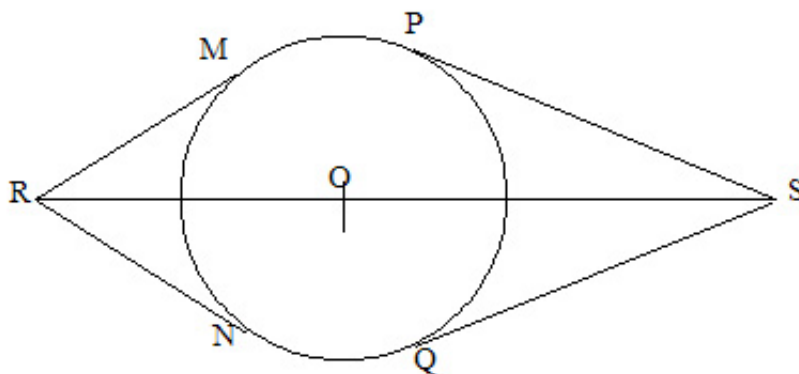
3. A circle passes through the vertices of $\diamond ABCD$, and $AB = CD$. Prove that $m\angle A = m\angle D$.



4. Prove two chords of a circle are congruent iff they subtend arcs of equal measure.
 (You must establish $m\widehat{AB} = m\widehat{CD}$ iff $AB = CD$. Recall that $m\widehat{AB} = m\angle AOB$.)



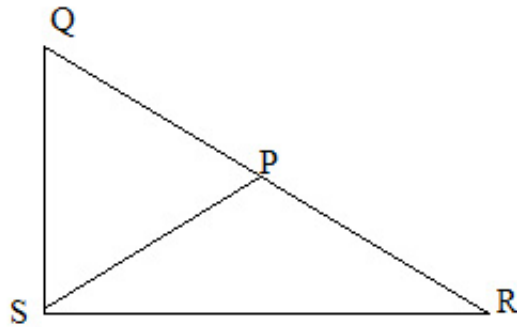
5. Tangents are drawn to circle O from points R and S , which lie on a line passing through the center O . If M, N, P , and Q are the points of contact, prove $m\widehat{MP} = m\widehat{NQ}$.



6. Prove that In Euclidean geometry, the sum of the measures of the angles of any triangle is 180.

7. **Transitivity of Parallelism in Euclidean Geometry** Prove that for three distinct lines ℓ, m and n , if $\ell \parallel m$ and $m \parallel n$, then $\ell \parallel n$.

8. Prove that in Euclidean geometry, if $PQ = PR = PS$, and $Q - P - R$ then $\triangle QRS$



is a right triangle.