

1. Show that a quadrilateral is cyclic if and only if one side subtends equal angles at the other two vertices.

2. Suppose $\triangle ABC$ is an acute triangle and let D, E, F denote the feet of altitudes from A, B, C , respectively.

Show that the orthocenter H of the triangle $\triangle ABC$ is the incenter of the triangle $\triangle DEF$.

Note: The triangle $\triangle DEF$ is called the *orthic* triangle of the triangle $\triangle ABC$.

3. Show that a quadrilateral is a tangent quadrilateral if and only if the sums of the pairs of opposite sides are equal.

Note: This is Theorem 39 in your textbook. I am asking you to figure out, or understand the proof on your own.