Examlet 1 **Advanced Geometry** **2/6/17**

1. a) State the definition of a line segment.

b) State the definition of an angle bisector.

c) State the definition of congruent triangles.

2. Name and state the three different parallel postulates we have discussed.

3. Recall the three axioms of Incidence Geometry:

   - **Incidence Axiom 1:** For every pair of distinct points P and Q there exists exactly one line l such that both P and Q lie on l.
   - **Incidence Axiom 2:** For every line l there exist at least two distinct points P and Q such that both P and Q lie on l.
   - **Incidence Axiom 3:** There exist three points that do not all lie on any one line.

   a) Give an example of a geometry satisfying Incidence Axioms 1 and 3 but not 2.

   b) Give an example of a geometry satisfying Incidence Axioms 2 and 3 but not 1.

4. Show that $\angle ABC = \angle CBA$.

5. Prove that if D and E are two distinct points, then there exists a unique perpendicular bisector for $\overline{DE}$.