Honors Geometry Spheres - 2 Name:

**Answer the questions below as completely as possible. Use complete sentences and add sketches as needed. Work with a model before you try to answer the questions.**

1. Determine whether each of the statements below is true or false.

a) Perpendicular lines exist.



b) All right angles are congruent.

c) All vertical angles are congruent.

d) Given a line and a point not on that line, there exists exactly one perpendicular line through that point.

e) Supplements of congruent angles are congruent.

2. Do transformational isometries exist on a sphere?

 a) reflections? (And do they still reverse orientation?)

 b) rotations?

 c) translations?

 d) Can all spherical lines be translated along themselves?

 e) Can all spherical lines be rotated onto themselves? Where is the center of rotation?

3. (Cevian theorem) In the diagram triangle ABC is shown with cevian  where D is the center of the lune formed by  and .



a) Is  an angle bisector?

b) Is  a median?

c) Is  an altitude?

d) Is triangle ABC isosceles?

4. The intersection of two lunes with perpendicular axes is shown with resulting quadrilateral EFGH.

a) Are opposite sides congruent?

b) Are all the angles congruent?

c) What type of quadrilateral is EFGH?

d) Are the angles right angles?

e) Are opposite sides parallel?

5. In the diagram is a 90°-90°-90° triangle. Determine whether each of the theorems below is true.

a) The sum of the angles is a triangle is 180°

b) An exterior angle of a triangle is equal to the sum of the remote interior angles.

c) The sum of the exterior angles of any polygon is always 360°.

d) What postulate do all of these theorems depend upon?