

Please work on the blank paper provided, then staple this page to the front.

1. (a) [5 pts] State Euclid's Fifth Postulate (any version).  
(b) [6 pts] State your choice of any two of his other postulates.
2. (a) [2 pts] List the 5 categories into which Hilbert's Axioms are grouped.  
(b) [5 pts] State your choice of one of his axioms, telling which category it belongs to.  
(c) [5 pts] State your choice of another of his axioms from a different category, again telling which category it belongs to.
3. [3 pts] How did Hilbert's and Birkhoff's approaches to geometry differ?
4. [15 pts] State and prove Pasch's Theorem.
5. [15 pts] State the Perpendicular Bisector Theorem, then prove your choice of a direction.
6. [9 pts - 3 each] For each trio of between-ness statements below, tell whether the trio is consistent with or in violation of the Chaining Theorem. For consistent trios, tell which two statements get chained to make the other.
  - (a)  $A - B - C$        $B - A - P$        $P - B - C$
  - (b)  $M - A - T$        $H - T - M$        $H - A - T$
  - (c)  $X - Y - Z$        $X - Y - W$        $W - Z - Y$
7. (a) [5 pts] State the Plane Separation Postulate.  
(b) [5 pts] State your choice of the Ruler Placement or the Protractor Placement (Angle Construction) Postulate; tell which you chose.  
(c) [5 pts] State your choice of the Distance or the Angle Measurement Postulate; tell which you chose.
8. [10 pts] A Geometer's Sketchpad task:
  - (a) Draw an angle (be sure it fits the definition!), and label it so that its name is  $\angle CAT$ .
  - (b) Measure it.
  - (c) Construct its bisector (no special name is needed).
  - (d) Create animation buttons (look under the Edit Menu - Action Buttons submenu) to animate the points  $C$ ,  $A$ , and  $T$ , and name your buttons accordingly.
  - (e) Put your name in a text box along with the title ANGLE.
  - (f) Email the Sketch to me at lyn.miller@sru.edu .
9. [10 pts] Another Geometer's Sketchpad task:
  - (a) Draw a triangle named  $\triangle SUM$ .
  - (b) Construct the perpendicular bisector of  $\overline{US}$ .
  - (c) Construct the intersection - name it  $I$  - of the bisector and side  $\overline{SM}$ . (Drag if needed to make sure they intersect.)
  - (d) Construct a circle centered at  $M$  and passing through  $I$ .
  - (e) Put your name in a text box with the title CIRCLE.
  - (f) Email this as well.