

Prepare for the exam by studying the topics below, in conjunction with your notes, text, graded and ungraded HW problems, and previous exams. The Final Exam is worth only 100 POINTS, the same as any other exam in the course.

**Non-Proof Tasks:**

1. List the four components of an axiomatic system.
2. Given the Incidence Axioms, determine, justify whether a given interpretation satisfies them.
3. List my choice of 1, 2 or all three Parallel Postulates; give their names.
4. Identify which Parallel Postulate(s) a given interpretation satisfies.
5. State the first four of Euclid's Postulates; distinguish between #1 and #2.
6. Name three other sources of postulates and rough dates: Hilbert, Birkhoff, SMSG (spell it out).
7. Know the SMSG postulate for use in proofs, but you need not state them.
8. Know definitions of objects (segment, bisector, etc.) for proofs, but you need not state them.
9. Formally state:
  - (a) Pasch's Theorem, SAS, ASA, SSS, Triangle Inequality, Saccheri-Legendre Theorem
  - (b) "iff" versions of Isosceles Triangle Theorem (ITT), Perpendicular Bisector Theorem, Angle Bisector Theorem, Alternate Interior Angle-Parallel Theorem (AIP)

**Proof Tasks:**

1. Prove a basic betweenness result.
2. Prove Pasch's Theorem.
3. Prove my or your choice of direction in the ITT, Perp. Bisector, or Angle Bisector Theorems.
4. Prove ASA using SAS as a postulate, my choice of case in SSS, using SAS and ASA as postulates.
5. Prove the Exterior Angle Theorem.
6. Prove the Triangle Inequality.
7. Prove the AIP Theorem (Theorem 3.4.1).
8. Prove the Saccheri-Legendre Theorem.
9. Prove basic high school-style results about triangles, quadrilaterals, etc.

**History tasks:** (Expect a few "short answer" questions.)

1. Name 3-4 cultures that used geometry in an applied way.
2. In your own words, explain what was new and different about the Greek approach to geometry.
3. Name 3-4 famous Greek mathematicians and the areas of math or the significant life events for which they are famous.
4. When was non-Euclidean geometry first developed? Name 2-3 mathematicians who contributed.