

I think I will put 1-2 of these on the final exam:

SAS, ASA, SSS and its lemmas.

I plan to put theorem 57 on the exam, and a part of theorem 54 on the exam.

Sample 54 question:

Prove the following part of theorem 54: Given a pair of lines intersected at distinct points by a transversal, prove that if the angles in one pair of interior angles on the same side of a transversal are supplementary, then the alternate interior angles are congruent.

There will be about 5 quadrilateral theorems on the test. They will be provable using the theorems about parallel lines and angle sums, and a combination of these strategies:

1. Prove that one of the diagonals splits the quadrilateral into two congruent triangles using ASA, SSS or SAS. (practice by doing this for parallelograms, rectangles, kites and do this for rhombi in two ways with the same diagonal)
2. Prove that there are a pair of congruent overlapping triangles in a quadrilateral (using the two diagonals to make the two triangles—this technique is useful for rectangles)
3. Prove opposite sides are parallel using theorem 44 (P6, P7, R2, H2) or that adjacent angles are supplementary (or other angles are congruent) using Axiom 7.

Note, for some problems you may need to do 1 or 2 before 3, and for other problems, you may need to do 3 before 1 or 2

4. Prove that if you split a quadrilateral using both diagonals, you get congruent triangles of the following types:
  - a. The opposite pair(s) of triangles are congruent
  - b. The adjacent pair(s) of triangles are congruent

Note: 3a is true for some kinds of quadrilaterals, and 3b is true of other kinds of quadrilaterals. For most quadrilaterals one or the other is true, but not both.

Here is a list of problems that it would be good to practice with:

Q1, P4, P6

The adjacent angles of a parallelogram are supplementary

P1, P2,

The intersection of the diagonals of a parallelogram is the midpoint of both diagonals.

R1, R2, R3, R6,

If a quadrilateral has a pair of congruent opposite sides, and those sides are perpendicular to one of the connecting sides, then it is a rectangle.

The diagonals of a rectangle are congruent.

H2, H3, H4, H6

The diagonals of a rhombus are perpendicular

Every kite has at least one pair of congruent angles