MA 241
Homework #4
### Due Tuesday, September 21, in class

I am not asking you to hand anything in, but want you to consider the following problems in *Shapes and Designs*. Work them out for yourselves, and identify any questions you may have.

You should also read the Mathematical Reflections questions on pages 39–40, 60–61, and 87–88..

1. p. 76, #1–7

2. p. 77, #8–14

3. p. 78, #15–22

4. p. 79, #23–27

5. p. 81, #29–30

6. p. 82, #32–34

7. p. 83, #35–38

8. p. 84, #39

9. p. 85, #43

10. p. 86, #44–49

In addition, consider the following additional problems. You may assume the following theorems are already known.

- if lines ℓ and m cross as in the figure below, then $w = y$, $x = z$, w and x are supplementary, x and y are supplementary, y and z are supplementary, and w and z are supplementary.
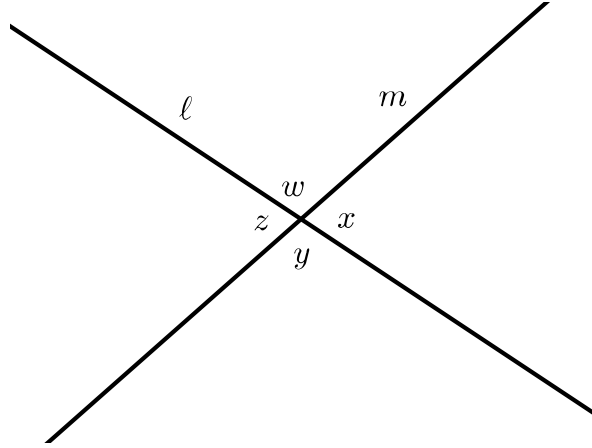
- If line n is a transversal to lines ℓ and m, and ℓ and m are parallel, and A and B are a pair of corresponding angles, then these two angles have the same measure.

- If line n is a transversal to lines ℓ and m, and A and B are a pair of corresponding angles, and these two angles have the same measure, then ℓ and m are parallel.

1. Prove: The measures of the interior angles of every triangle sum to 180 degrees.

2. Prove: In every parallelogram, opposite angles are equal, and two angles sharing a common edge are supplementary.

3. Prove: If P is a quadrilateral in which both pairs of opposite angles are equal, then P is a parallelogram.

4. If P is a quadrilateral in which at least one pair of opposite angles is equal, must P be a parallelogram?