

Geometry Midterm

Sarah Wright

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Write a brief summary of how your oral exam went. Include some aspect that you worked hard on and went well. Also describe something you will focus your practice on for the remainder of the semester and the final exam. What you include below for each problem should be a formal write-up of final draft quality; follow the same Writing Style Guide as we use for papers.

1. For my construction, I chose to construct a perpendicular.

Proposition I.12. *To a given infinite straight line, from a given point which is not on it, to draw a perpendicular straight line.*

Proof. This is, of course, where you include the construction and proof. There should be diagrams! □

2. The previous result that Sarah asked me to prove was that the diagonals of a kite are perpendicular.

Theorem 2.5. *If the diagonals of a kite meet, then they meet at a right angle.*

Proof. Put the proof here. It should be your own proof, not simply a copy of the work of the original presenter or author of the paper. It does not need to be exactly the same as the proof you gave during your oral exam. □

3. I determined that the conjecture was true.

Theorem. *The diagonals of a parallelogram bisect one another.*

Proof. Put the proof of the theorem here. □

4. I determined the the conjecture was false.

Theorem 3.7. *Let $ABCD$ be a quadrilateral. The midpoints of the four sides need not form the vertices of a parallelogram.*

Proof. Include the proof of the resulting theorem here. □

5. Include here a description of the process you used to determine which result you would prove via contradiction.

Proposition I.4. *In triangles ABC and DEF , if sides AB and DE are congruent, sides BC and EF are congruent, and angles ABC and DEF are congruent, then the triangles and corresponding parts are congruent.*

Proof. Be extra clear in your proof set-up and in the contradiction that you reach. \square

Paper Folding

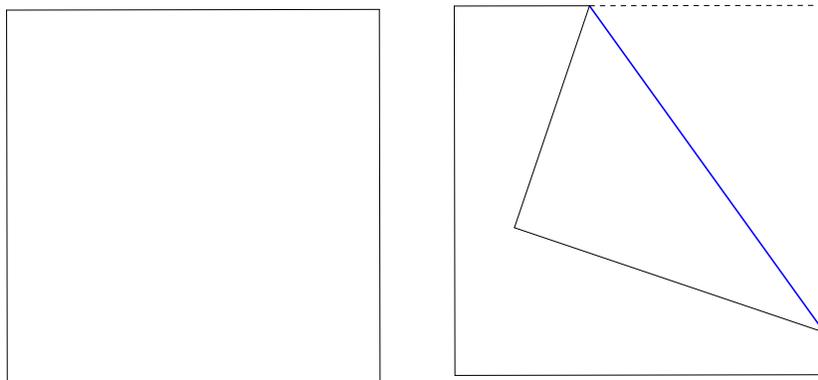
For this portion, you should be writing for an audience that is unfamiliar with this question. Explain the folding required and any special cases you noticed where the folding directions should be different. Some results are difficult to state formally. Include those types of things that you noticed in this narrative portion.

In a second part, include formal statements of any conjectures you have. You should aim to move as many statements from the informal section above to this part as you can.

In the third section, include the proof of one of your conjectures. Again, the more you have, the better, but definitely prove something.

In a final section, include any related ideas you could explore. You don't have to actually do any of this nor make any formal or informal conjectures. These statements could very likely start with the phrase, "I wonder what would happen if ..."

Start with a square piece of paper. Make a single fold in the paper. Any fold you wish.



This splits the four edges of the square into six segments. Fold each of these pieces to meet the main blue fold:

