Problem Set 10 **Advanced Geometry** **Due 5/6/19**

Each problem is worth 2 points. Clear and complete justification is required for full credit. You are welcome to discuss these problems with anyone and everyone, but must write up your own final submission without reference to any sources other than the textbook and instructor.

1. Use GeoGebra to explore what happens when you compose two translations. Write a brief description of what you find. Be sure to address whether distances remain fixed, whether the composite transformation has any fixed points, and whether there is a simpler way to describe the transformation.

2. Use GeoGebra to explore what happens when you compose two rotations. Consider both the case where the rotations have the same center and where the centers are different. Write a brief description of what you find. Be sure to address whether distances remain fixed, whether the composite transformation has any fixed points, and whether there is a simpler way to describe the transformation.

3. Use GeoGebra to explore what happens when you compose two reflections across lines that admit a common perpendicular. Write a brief description of what you find. Be sure to address whether distances remain fixed, whether the composite transformation has any fixed points, and whether there is a simpler way to describe the transformation.

4. Use GeoGebra to explore what happens when you compose two reflections across lines that do not admit a common perpendicular. Write a brief description of what you find. Be sure to address whether distances remain fixed, whether the composite transformation has any fixed points, and whether there is a simpler way to describe the transformation.

5. Use GeoGebra to explore what happens when you compose three reflections across lines ℓ, m, and n for which $\ell \perp m$ and $m \perp n$. Write a brief description of what you find. Be sure to address whether distances remain fixed, whether the composite transformation has any fixed points, and whether there is a simpler way to describe the transformation