Name: _____

Read Section 1.2, Sets and Equivalence Relations.

This section is a review of several foundational formal structures in mathematics: sets, relations, and functions. Read carefully, marking up your copy of the text and taking notes. Pay particular attention to the subsections: "Cartesian Products and Mappings" and "Equivalence Relations and Partitions."

Reading Questions

1. Make sure you know the following definitions: Cartesian product, relation, mapping/function, domain, range/image of function, well-definedness of relation, one-to-one/injective function, onto/surjective function, bijective function, composition of functions, identity map, inverse map, invertible map.

2. Reread Example 1.8. Using the definitions of one-to-one and onto, explain why the map f is one-to-one but not onto and why the map g is onto but not one-to-one.

3. Reread Example 1.17. The text asserts that the natural logarithm and exponential maps are inverses of each other, "provided that we are careful about choosing domains." What domains could we choose to ensure that the two maps are inverses of each other?

4. Make sure you know the following definitions: reflexivity property, symmetry property, transitivity property, equivalence relation, partition, equivalence class.

5. Reread Example 1.23. Explain why the given relation is an equivalence relation.

6. What struck you in this reading? What is still unclear? What remaining questions do you have?