MATH 2001
FIRST PROOF

Homework. Due Monday, February 8 at 6pm.

- Begin a new Overleaf document using the Proof Portfolio Template found on the course website.
  - Course website: http://math.colorado.edu/~thga2182/Discrete_math/16S/
  - Under the Resources heading, click on the `Overleaf` link next to 'Proof portfolio template'.
  - Copy the template for the Proof Portfolio into a new file, and send me the Read & Edit link to your file.

Exercise 1. Write a new definition of *set equality* that involves explicit statements regarding the elements in the sets.

Definition.

Exercise 2. Suppose A and B are sets, and $A = B$. What can you say specifically about the elements in A and B?

Exercise 3. Suppose A and B are sets. What would you have to do to prove that $A = B$?

Exercise 4. Write a new definition of *subset* that involves explicit statements regarding the elements in the sets.

Definition.

Exercise 5. Suppose A and B are sets, and $A \subseteq B$. What can you say specifically about the elements in A and B?

Exercise 6. Suppose A and B are sets. What would you have to do to prove that $A \subseteq B$?

Exercise 7. Prove the following theorem.

Theorem. *If A and B are sets, and $A = B$, then $A \subseteq B$.*

Proof.

□