Proof Notebook Problem 6

The Problems:

1. Let A and B be sets with the following functions defined on them: $f: A \to B$, $g: B \to A$. Assume $g \circ f = I_A$ and $f \circ g = I_B$. Show that f is bijective.
2. Let A and B be totally ordered sets under the relations $\leq_A$ and $\leq_B$. A function $f: A \to B$ is given. Assume f is increasing. First explain what it means for f to be increasing, then prove that f is injective.
3. Let $f: A \to B$ and $g: C \to D$ be functions on the sets A, B, C, and D. The notation "$f \cup g$" technically makes sense but is really weird. Figure out what it means, then show that it is a function on $A \cup C$ if and only if $f|_{A \cap C} = g|_{A \cap C}$.

Please do not do multiple problems: you should have a clear mind for the peer review.
Only use the third problem if you're in a group of three.

Due Dates:

Item	Due Date	Method
Draft 1	Friday, November 14 (10pm)	Blackboard
Peer Review 1	Before 2nd draft	Upload peer review worksheet to Blackboard
Draft 2	Tuesday, November 18	In class
Draft 3	Friday, November 21 (10pm)	Blackboard
Peer Review 2	Before final version	Upload peer review worksheet to Blackboard
Final Version	Tuesday, November 25	In class

The peer review process:

1. Schedule a time to meet in pairs or groups of 3. Come to the meeting with draft 1 completed.
2. Person 1 presents their proof on the board; Person 2 analyzes each step:
    1. Is this step intelligible or nonsense?
    2. Does this step say what the Person 1 thinks it says?
    3. Does this step follow from the previous steps?
    4. Is it clear why this step follows?
3. Switch roles and repeat (2).
4. Fill out the peer review worksheet and upload it on Blackboard.