To prove: If relation R is antisymmetric then R^{-1} is antisymmetric.

- 1. Let $R \subseteq S \times S$ be antisymmetric, for arbitrary set S.
- 2. Assume that R^{-1} is not antisymmetric. (Proof by contradiction)
- 3. $\exists x, y \in S, xR^{-1}y \land yR^{-1}x \land x \neq y$. (Step 2 and defn. of antisymmetry)
- 4. $\exists x, y \in S, xRy \land yRx \land x \neq y$. (Step 3 and defn. of R^{-1})
- 5. R is not antisymmetric, contradicting step 1. (Steps 4 and defn. of antisymmetry)
- 6. The assumption of step 2 is false: R^{-1} is antisymmetric.