Proposition 5.4: Let A, B, C be sets.

(i) $A = A$.

(ii) If $A = B$ then $B = A$.

(iii) If $A = B$ and $B = C$ then $A = C$.

Proof. Your proof goes here. □

Project 5.12 (partial): For each of the following double implications $P \iff Q$ determine which of the implications $P \implies Q$ or $Q \implies P$, if any, are true. For the ones that are true, prove them. For the ones are are not true, provide a counterexample.

(ii) $C \subseteq A$ or $C \subseteq B \iff C \subseteq (A \cup B)$

(iii) $C \subseteq A$ and $C \subseteq B \iff C \subseteq (A \cap B)$