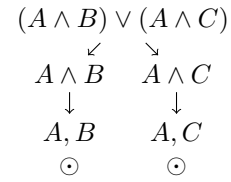
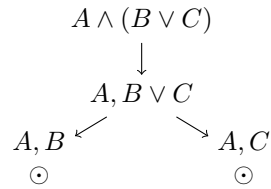


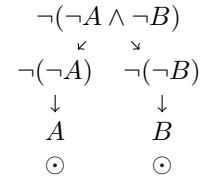
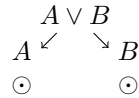
2.3.1 Propositional Logic.

Prove the following logical equivalences making use of semantic tableaux:

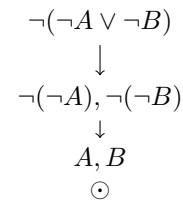
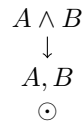
a) $A \wedge (B \vee C) \equiv (A \wedge B) \vee (A \wedge C)$



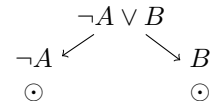
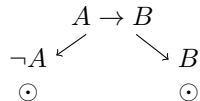
b) $A \vee B \equiv \neg(\neg A \wedge \neg B)$



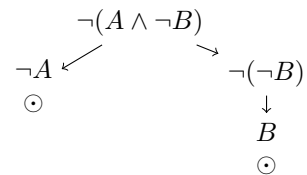
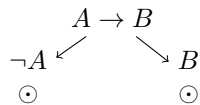
c) $A \wedge B \equiv \neg(\neg A \vee \neg B)$



d) $A \rightarrow B \equiv \neg A \vee B$



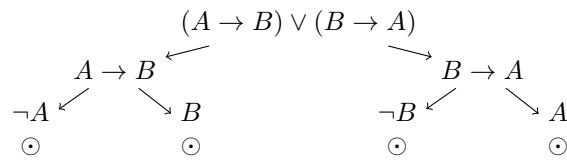
e) $A \rightarrow B \equiv \neg(A \wedge \neg B)$



2.3.2 Propositional Logic.

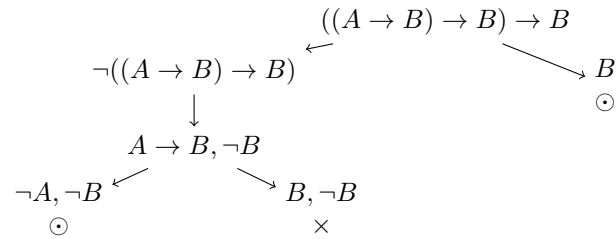
Prove or disprove making use of semantic tableaux:

a) $\models (A \rightarrow B) \vee (B \rightarrow A)$



As each item is represented only one, we can assume that this is always true

b) $\models ((A \rightarrow B) \rightarrow B) \rightarrow B$



As we found a contradiction, this is not always true