Math 2001 Homework 5

Due: 8 March 2019 (start of class)

1. (6.4.1) Show that $A \to B$, $\neg A \vee B$, and $\neg(A \wedge \neg B)$ are logically equivalent by writing out the truth table and showing that they have the same values for all truth assignments.
2. (6.4.2) Write out the truth table for $(A \to B) \wedge (B \wedge C \to A)$
3. (6.4.3.) Show that $A \to B$ and $\neg B \to \neg A$ are equivalent, by writing out the truth tables and showing that they have the same values for all truth assignments.
4. (6.4.4) Does the following entailment hold?

   $$\{A \to B \vee C, \neg B \to \neg C\} \vDash A \to B$$

   Justify your answer by writing out the truth table (sorry, it is long). Indicate clearly the rows where both hypotheses come out true.