CSE2315: Homework 1
Out: Jan 21
Due: Jan 28.

1. (10 points) Let A and B be two propositions. Explain the differences between the constructs $A \leftrightarrow B$ and $A \Leftrightarrow B$.

2. (10 points) Section 1.1: 11

3. (10 points) Section 1.1: 14

4. (10 points) Section 1.1: 15

5. (10 points) Section 1.1: 32

6. (10 points) Section 1.1: 37

7. (20 points) Decide whether the following statements are tautologies or contradictions or neither. Prove your answer in each case.

   - $(A \to B) \vee (B \to A)$
   - $(A \wedge B) \vee (B \to A')$
   - $A \to A'$
   - $(A \vee B') \to (B \wedge A')$

8. (20 points) Proving Equivalence via Truth Tables

   - $A \to B \Leftrightarrow A' \vee B$
   - $A \leftrightarrow B \Leftrightarrow (A \to B) \wedge (B \to A)$

9. (Extra credit 15 points) Suppose that $A' \to B'$ is known to be false. Give the truth values for:

   - $A \wedge B$
   - $A \oplus B$
   - $A \to B$

   Please provide the proof to support your solutions.