To get full credit, you should at least submit solutions to the problems not marked \textit{optional} below.

1. Exercise 5.20 from Russell and Norvig.

2. Show that the following sentences are consistent by identifying a world that satisfies each sentence:
\begin{enumerate}
\item \((A \Rightarrow B) \land (A \Rightarrow \neg B)\)
\item \((A \lor B) \Rightarrow (\neg A \land \neg B)\)
\end{enumerate}

3. Which of the following sentences are valid? If a sentence is not valid, identify a world that does not satisfy the sentence.
\begin{enumerate}
\item \((A \land (A \Rightarrow B)) \Rightarrow B\)
\item \((A \land B) \lor (A \land \neg B)\)
\item \((A \Rightarrow B) \Rightarrow (\neg B \Rightarrow \neg B)\)
\end{enumerate}

4. (Optional) Exercise 7.5 from Russell and Norvig.

5. Exercise 7.17 from Russell and Norvig.


7. Convert the following sentences to CNF:
\begin{enumerate}
\item \(P \Rightarrow (Q \Rightarrow R)\)
\item \(\neg((P \Rightarrow Q) \land (R \Rightarrow S))\)
\end{enumerate}

8. (Optional) Exercise 7.19 from Russell and Norvig.