Logic

Before you start.

Download and read a short essay on

  Good Mathematical Writing

and write up your solutions to the following exercises with these guidelines in mind.

Hint: If the link above does not work, you can also find the Pdf on the course webpage.

Exercise 1. Prove that $\neg N$ follows logically from $H \wedge \neg R$ and $(H \wedge N) \Rightarrow R$.

Exercise 2. See pages 37–39 of the lecture slides week 2 and answer the two questions.

∗**Exercise 3.** Prove that $8 \mid (n^2 - 1)$ for every odd number n (that is, for every $n \in \mathbb{N}$ such that $2 \nmid n$).

Exercise 4. The country of Mew is inhabited by two types of people: liars always lie and truars always tell the truth. At a cocktail party the newly appointed Australian ambassador to Mew talked to three inhabitants. Joan remarked that Shane and Peter were liars. Shane denied he was a liar, but Peter said that Shane was indeed a liar. Now the ambassodor wondered how many of the three were liars.

Use propositional logic formulae to help the ambassador.