Exercise Sheet 4

Question 4.1 Derive the rules of propositional Hoare logic with Isabelle.

Question 4.2 With the Isabelle verification component, prove that the following program, which computes x^n for $n \in \mathbb{N}$, is partially correct. Don't use the tactic!

$$\{True\}$$
$$i := 0;$$
$$y := 1;$$
$$\textbf{while } i < n \textbf{ do } \{y = x^i \wedge i \leq n\}$$
$$\quad y := y \cdot x;$$
$$\quad i := i + 1$$
$$\{y = x^n\}$$

Question 4.3 Derive the rules of the propositional refinement calculus with Isabelle.

Question 4.4 With the Isabelle refinement component, prove partial correctness of the above program that computes x^n.