Solution 1

- (a) $\exists x \in X$ such that $S(x) \wedge A(x)$ is true.
- (b) $\forall x \in X, T(x) \land S(x) \implies A(x)$
- (c) $\nexists x \in X$ such that $(T(x) \land S(x)) \land \neg A(x)$
- (d) $S = \{ \forall x \in X : T(x) \land \neg S(x) \}.$ Then, $|S| \ge 3$

Solution 2

TODO: It's easy enough. So, I'll skip it for later.

Solution 3

- (a) (i) $\neg (A \text{ nand } B)$
 - (ii) (A nand A) nand (B nand B)
 - (iii) $(\neg A \text{ nand } \neg A) \text{ nand } (B \text{ nand } B)$
- (b) $\neg A = A \text{ nand } A$.
- (c)