Task 1 Anne, Maria, and Johanna are 3 sisters, and no two of them are of the same age. If the following statements are all true, which of them is the youngest?

- Maria is the oldest.
- Johanna is not the oldest.
- Anne is not the youngest.

Task 2 Mazzini, an Italian specialty restaurant stays open every Monday to Saturday but is closed on all Sundays. On Mondays, only lunch is served, as well as on Tuesdays and Thursdays. On Wednesdays, Fridays and Saturdays, just dinner is served. The restaurant's floors are polished and plants are watered only on days that the restaurant is open for business, according to the following schedule:

- Plants are watered two days each week, but never on consecutive days and never on the same day that floors are polished.
- Floors are polished on Monday and two other days each week, but never on consecutive days and never on the same day that plants are watered.

a) According to the schedule, the restaurant's floors are polished on either:

   A. Tuesday or Wednesday
   B. Tuesday or Thursday
   C. Wednesday or Thursday
   D. Thursday or Friday
   E. Thursday or Saturday

b) If dinner is served on the same day as plants are watered, which of the following is correct?

   A. Plants are watered on Tuesday.
   B. Floors are polished on Thursday.
   C. Plants are watered on Wednesday.
   D. Floors are polished on Wednesday.
   E. Plants are watered on Saturday.

Task 3 Prove that if $X \subseteq Y$ and $Y \subseteq Z$, then $X \subseteq Z$.

Task 4 Prove that $X' \subseteq Y'$ and $X'' \subseteq Y''$, then $X' \cap X'' \subseteq Y' \cap Y''$.

Task 5 Prove one of the absorption laws, e.g. $X \cup (X \cap Y) = X$.

Task 6 Prove that $(X \setminus Y) \cap Y = \emptyset$.

Task 7 Prove that if $X \subseteq Y$, then $\mathcal{P}(X) \subseteq \mathcal{P}(Y)$.

Task 8 Prove that $X \cap Y = X$ iff $X \cup Y = Y$.