

HOMEWORK 18
MATH 3345 – SPRING 2022 – KUTLER

Please complete the following problems on your own paper. Solutions should be written clearly, legibly, and with appropriate style.

1. **[Falkner Section 10 Exercise 7]** Let $A = \{1, \{4, 7\}, 9\}$ and $B = \{\{1, 4\}, 7, 9\}$. Find $A \cup B$, $A \cap B$, $A \setminus B$, and $B \setminus A$.
2. **[Falkner Section 10 Exercise 8]** Let A and B be sets. Show that $A \cap B \subseteq A$ and $A \cap B \subseteq B$.

Practice Problems

It is strongly recommended that you complete the following problems. There is no need to write up polished, final versions of your solutions (although you may find this a useful exercise). Please do not submit any work for these problems.

1. Let A and B be sets. Prove that

$$A \cup B = B \cup A \quad \text{and} \quad A \cap B = B \cap A.$$

2. Let A , B , and C be sets. Prove that

$$(A \cup B) \cup C = A \cup (B \cup C) \quad \text{and} \quad (A \cap B) \cap C = A \cap (B \cap C).$$

3. Give an example of sets A , B , and C such that

$$(A \cup B) \cap C \neq A \cup (B \cap C).$$