Oppgave 1

$$A = \{1, 2, 3, 4\} \qquad B = \{1, 3, 5, 7\} \tag{1}$$

Oppgave 1a

$$A \cup B = \{x \mid x \in A \vee x \in B\} = \{1, 2, 3, 4, 5, 7\} \tag{2}$$

$$A \cap B = \{x \mid x \in A \wedge x \in B\} = \{1, 3\} \tag{3}$$

$$A \setminus B = \{x \mid x \in A \wedge x \notin B\} = \{2, 4\} \tag{4}$$

Oppgave 1b

$U = \mathbb{N}$

$$A \cap \bar{B} = A \cap (U \setminus B) = A \setminus B = \{2, 4\} \tag{5}$$

Oppgave 1h

Beskriv $P(A)$

$$\begin{aligned} P(A) = \{S \mid S \subseteq A\} = \{\emptyset, \{1\}, \{2\}, \{3\}, \{4\}, \{1, 2\}, \{1, 3\}, \{1, 4\}, \\ \{2, 3\}, \{2, 4\}, \{3, 4\}, \{1, 2, 3\}, \{1, 2, 4\}, \{1, 3, 4\}, \{2, 3, 4\}, \{1, 2, 3, 4\}\} \end{aligned} \tag{6}$$

$$|P(A)| = 2^{|A|} = 2^4 = 16 \tag{7}$$

Oppgave 1e

$C = \{\{1\}, \{3, 4, 5\}, \{2, 3\}, 4, \emptyset, \{\{2\}\}, A\}$

$$\{S \in C \mid S \subseteq A\} = \{\{1\}, \{2, 3\}, \emptyset, A\} \tag{8}$$

Oppgave 2

Gitt A og B:

$$\overline{A \cup B} = \overline{A} \cap \overline{B} \tag{9}$$

Bevis:

Anta $x \in \overline{A \cup B}$

$$\begin{aligned} x &\notin A \cup B \\ x &\notin A \wedge x \notin B \\ x &\in \overline{A} \wedge x \in \overline{B} \\ x &\in \overline{A} \cap \overline{B} \end{aligned} \tag{10}$$