Empty set, the universe (2) Associativity  $(A \cup B) \cup C = A \cup (B \cup C)$  $A \cup \emptyset = A$  $A \cap \overline{\emptyset} = A$  $(A \cap B) \cap C = A \cap (B \cap C)$ (3) Commutativity (4) Distributivity  $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$  $A \cup B = B \cup A$  $A \cap B = B \cap A$  $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ (5) Complement (6) de Morgan  $A \cap \overline{A} = \emptyset$  $\overline{(A \cup B)} = \overline{A} \cap \overline{B}$  $\overline{(A \cap B)} = \overline{A} \cup \overline{B}$  $A \cup \overline{A} = \overline{\emptyset}$ b)  $A \setminus B = A \cap \overline{B}$ a)  $A \subseteq B$  iff  $A \cup B = B$  iff  $A \cap B = A$ 

$$(X \land Y) \cup (X - Y) \stackrel{!}{=} X$$

$$A \cap (A \cup B) = A$$

$$(X \land Y) \cup (X - Y)$$

$$\stackrel{(1)}{=} (X - Y) \cup (X \land Y)$$

$$\stackrel{(2)}{=} ((X - Y) \cup X) \cap ((X - Y) \cup Y)$$

$$\stackrel{(2)}{=} ((X \cap \overline{Y}) \cup X) \cap ((X \cap \overline{Y}) \cup Y)$$

$$\stackrel{(2)}{=} ((X \cap \overline{Y}) \cup X) \cap ((X \cap \overline{Y}) \cup Y)$$

$$\stackrel{(2)}{=} ((X \cap (\overline{Y} \cup X)) \cap ((X \cap \overline{Y})) \cap ((X \cup X) \cap (\overline{Y} \cup Y))$$

$$\stackrel{(2)}{=} (X \cap (\overline{Y} \cup X)) \cap ((X \cap \overline{Y}))$$

$$\stackrel{(2)}{=} (X \cap (\overline{Y} \cup X)) \cap ((X \cup Y))$$

$$\stackrel{(2)}{=} (X \cap ((X \cup X)) \cap ((X \cup$$

$$= \left( \frac{21(207)}{4L} \right) \left( \frac{xnyn2ny}{(5)} \right)$$

$$= \left( \frac{2}{2} 0 \left( \frac{xnyn2ny}{(5)} \right) \right)$$

$$= \left( \frac{2}{2} 0 \left( \frac{xnyn2ny}{(5)} \right) \right)$$

$$= \left( \frac{2}{2} \frac{1}{2} \frac{2}{2} \frac{1}{2} \frac{2}{2} \frac{1}{2} \frac{1}$$