

$$U = \{x \in \mathbb{N} \mid 1 \leq x \leq 15\}$$

$$14. E = \{1, 2, 3, 4, 5, 6, 9\}$$

$$E' = \{7, 8, 10, 11, 12, 13, 14, 15\}$$

$$D = \{2, 5, 7, 9, 10, 12, 15\}$$

$$D' = \{1, 3, 4, 6, 8, 11, 13, 14\}$$

$$B = \{1, 2, 3, 4, 5, 6, 7, 8\}$$

$$B' = \{9, 10, 11, 12, 13, 14, 15\}$$

$$C = \{2, 3, 4, 5, 6, 7, 9, 10\}$$

$$C' = \{1, 8, 11, 12, 13, 14, 15\}$$

$$A = \{3, 4, 5, 7, 8, 9, 10\}$$

$$A' = \{1, 2, 6, 11, 12, 13, 14, 15\}$$

$$a. (A \cup B \cap C) \cup (D \cap E) = \{2, 3, 4, 5, 6, 7, 9, 10\}$$

$$A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$$

$$A \cup B \cap C = \{2, 3, 4, 5, 6, 7, 9, 10\}$$

$$D \cap E = \{2, 5, 9\}$$

$$b. (A \cap B) \cap ((C \cap D) \cap E) = \{5\}$$

$$(A \cap B) = \{3, 4, 5, 7, 8\}$$

$$(C \cap D) = \{2, 5, 7, 9, 10\}$$

$$(C \cap D) \cap E = \{2, 5, 9\}$$

$$c. (A \cup B) \cap (C \cup D) \cap E = \{2, 3, 4, 5, 6, 9\}$$

$$(C \cup D) = \{2, 3, 4, 5, 6, 7, 9, 10, 12, 15\}$$

$$(A \cup B) \cap (C \cup D) = \{2, 3, 4, 5, 6, 7, 9, 10\}$$

$$d. (A \cup B) \Delta (C \cup D) \Delta E = \{2, 3, 4, 5, 6, 8, 9, 12, 15\}$$

$$(A \cup B) \Delta (C \cup D) = \{1, 8, 12, 15\}$$

$$e. (C - C') \cup (A - B) \cap (E - E') = \{\emptyset\}$$