1:

$A = \{2, 4, 6\}$

$B = \{4, 5, 6\}$

$A \cup B = \{2, 4, 5, 6\}$

$(A \cup B)^C = \{1, 3\}$

$A^C = \{1, 3, 5\}$

$B^C = \{1, 2, 3\}$

$A^C \cap B^C = \{1, 3\}$

$A \cap B = \{4, 6\}$

$(A \cap B)^C = \{1, 2, 3, 5\}$

$A^C \cup B^C = \{1, 2, 3, 5\}$

2:

Using the above sets A and B as examples:

(a)

$(A^C \cap B) = \{5\}$

$(A^C \cap B^C) = \{1, 3\}$

$(A^C \cap B) \cup (A^C \cap B^C) = \{1, 3, 5\}$

$(A \cap B^C) = \{2\}$

$(A^C \cap B^C) = \{1, 3\}$

$(A \cap B^C) \cup (A^C \cap B^C) = \{1, 2, 3\}$

(b)

$(A \cap B)^C = \{1, 2, 3, 5\}$

$(A^C \cap B) = \{5\}$

$(A^C \cap B^C) = \{1, 3\}$

$(A \cap B^C) = \{2\}$

$(A^C \cap B) \cup (A^C \cap B^C) \cup (A \cap B^C) = \{1, 2, 3, 5\}$

(c)

$A = \{1, 3, 5\}$

$B = \{1, 2, 3\}$

$A \cap B = \{1, 3\}$

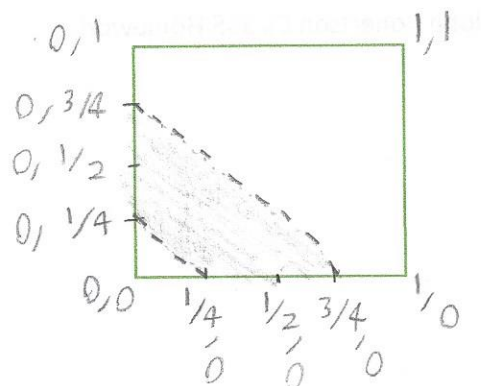$(A \cap B)^C = \{2, 4, 5, 6\}$

$A^C = \{2, 4, 6\}$

$B^C = \{4, 5, 6\}$

$(A \cap B^C) = \{5\}$

$(A^C \cap B) = \{2\}$

$(A^C \cap B^C) = \{4, 6\}$

$(A^C \cap B) \cup (A^C \cap B^C) \cup (A \cap B^C) = \{2, 4, 5, 6\}$

3:

4: