



◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시

1) 제작연월일 : 2018-06-04

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3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초 제작일부터 5년간 보호됩니다.

◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법 외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

01 / 집합의 연산법칙

(1) 흡수법칙

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

(2) 드모르간의 법칙

$$(A \cap B)^c = A^c \cup B^c, \quad (A \cup B)^c = A^c \cap B^c$$

(3) 부정법칙

$$(A^c)^c = A, \quad \{(A^c)^c\}^c = A^c$$

■ 전체집합 U 의 두 부분집합 A, B 에 대하여 다음을 간단히 하여라.

1. $A \cup A$

2. $A \cap A$

3. $A \cup \emptyset$

4. $A \cap \emptyset$

5. $(A \cup A) \cap U$

6. $(A \cap A) \cup \emptyset$

7. $(A \cup \emptyset) \cap A$

8. $(A \cap \emptyset) \cap U$

9. $A \cup U$

10. $A \cap U$

11. $B^c \cup B$

12. $B^c \cap B$

13. $(B^c)^c$

14. \emptyset^c

15. U^c

■ 전체집합 U 의 두 부분집합 A, B 에 대하여 다음을 간단히 하여라.

16. $(A \cup B^c)^c$

17. $(A \cap B^c)^c$

18. $(A^c \cup B)^c$

19. $(A^c \cap B)^c$

20. $(A^c \cup B^c)^c$

21. $(A^c \cap B^c)^c$

22. $A \cap (B \cap A^c)$

23. $A \cup (A \cap B)^c$

24. $(A^c \cup B) \cap A$

25. $A \cup (A^c \cap B^c)$

26. $(B^c - A)^c \cap A$

27. $A - (A^c - B)$

28. $(A - B) - A$

29. $(A \cup B) \cup (A^c \cap B^c)$

30. $(A \cup B) \cap (A \cup B^c)$

31. $(A \cup B) \cap (A - B)^c$

32. $(A - B) \cup (A - B^c)$

■ 전체집합 U 의 두 부분집합 A, B 에 대하여 다음 중 옳은 것은 ○표, 옳지 않은 것은 ×표를 ()안에 써넣어라.

33. $A^c = U - A$ ()

34. $A - A^c = \emptyset$ ()

35. $A - B = A \cap B^c$ ()

36. $(A \cap B) \subset (A \cup B)$ ()

37. $A \cap B = \emptyset$ 이면 $A \cup B = U$ ()

38. $A \cap B = \emptyset$ 이면 $A^c = B$ ()

39. $A \cup B = A$ 이면 $A \cap B = B$ ()

40. $A \cup B = U$ 이면 $B = A^c$ ()

41. $A \cap B^c = \emptyset$ 이면 $A \subset B$ ()

42. $A - B = A$ 이면 $B = \emptyset$ ()

■ 전체집합 U 의 두 부분집합 A, B 에 대하여 다음 ☐ 안에 알맞은 것을 써넣어라.

43. $A - B = A \cap$ ☐

44. $B - A = B \cap$ ☐

45. $A - B^c = A \cap (\text{ })^c = A \cap$ ☐

46. $A^c - B = A^c \cap$ ☐

47. $B - A^c = B \cap (\text{ })^c = B \cap$ ☐

48. $A^c - B^c =$ ☐ $\cap (B^c)^c =$ ☐ $\cap B$

■ 다음은 전체집합 U 의 두 부분집합 A, B 에 대하여 주어진 식을 간단히 하는 과정이다. ☐ 안에 알맞은 것을 써넣어라.

49. $A \cap (B \cup B^c) = A \cap$ ☐
 $=$ ☐

50. $A \cap (A^c \cap B) = (A \cap A^c) \cap B$
 $=$ ☐ $\cap B$
 $=$ ☐

51. $A^c \cup (A \cap B) = (A^c \cup A) \cap (A^c \cup B)$
 $= U \cap (A^c \cup B)$
 $=$ ☐

52. $A \cup (A \cap B)^c = A \cup (A^c \cup B^c)$
 $= (\text{ }) \cup B^c$
 $=$ ☐ $\cup B^c$
 $=$ ☐

53. $A \cap (A - B)^c = A \cap (A \cap B^c)^c$
 $= A \cap \{A^c \cup (\text{ })^c\}$
 $= A \cap (A^c \cup B)$
 $= (A \cap A^c) \cup (\text{ })$
 $= \emptyset \cup (\text{ })$
 $=$ ☐

$$\begin{aligned}
 54. \quad & (B^c - A^c)^c \cap A = \{B^c \cap (A^c)^c\}^c \cap A \\
 & = (B^c \cap \boxed{})^c \cap A \\
 & = \{(B^c)^c \cup \boxed{}\} \cap A \\
 & = (B \cup A^c) \cap A \\
 & = (B \cap A) \cup (A^c \cap A) \\
 & = (B \cap A) \cup \boxed{} \\
 & = \boxed{}
 \end{aligned}$$

$$\begin{aligned}
 55. \quad & (A - B^c) \cup (B \cap C) \\
 & = \{A \cap (B^c)^c\} \cup (B \cap C) \\
 & = (A \cap \boxed{}) \cup (B \cap C) \\
 & = (B \cap A) \cup (B \cap C) \\
 & = B \cap (A \cup C)
 \end{aligned}$$

$$\begin{aligned}
 56. \quad & (A \cap B^c) \cup (A^c \cup C)^c \\
 & = (A \cap B^c) \cup \{(A^c)^c \cap C^c\} \\
 & = (A \cap B^c) \cup (\boxed{} \cap C^c) \\
 & = A \cap (B^c \cup C^c) \\
 & = A \cap (\boxed{})^c \\
 & = A - (\boxed{})
 \end{aligned}$$

■ 다음은 전체집합 U의 세 부분집합 A, B, C에 대하여 집합의 연산의 성질과 법칙을 이용하여 간단히 하는 과정이다. 각 과정에서 이용된 것을 <보기> 중 골라 차례대로 써라.

<보기>

- | | |
|---------------------|-----------------------------|
| ㄱ. $A \cup A^c = U$ | ㄴ. $A \cap A^c = \emptyset$ |
| ㄷ. $(A^c)^c = A$ | ㄹ. $A - B = A \cap B^c$ |
| ㅁ. 교환법칙 | ㅂ. 결합법칙 |
| ㅅ. 분배법칙 | ㅇ. 드모르간의 법칙 |

$$\begin{aligned}
 57. \quad & A \cup (A \cap B)^c \\
 & = A \cup (A^c \cup B^c) \\
 & = (A \cup A^c) \cup B^c \\
 & = U \cup B^c \\
 & = U
 \end{aligned}$$

$$\begin{aligned}
 58. \quad & A \cap (A \cup B)^c \\
 & = A \cap (A^c \cap B^c) \\
 & = (A \cap A^c) \cap B^c \\
 & = \emptyset \cap B^c \\
 & = \emptyset
 \end{aligned}$$

$$\begin{aligned}
 59. \quad & A \cup (B^c \cup A^c) \\
 & = A \cup (A^c \cup B^c) \\
 & = (A \cup A^c) \cup B^c \\
 & = U \cup B^c \\
 & = U
 \end{aligned}$$

$$\begin{aligned}
 60. \quad & A - (B \cap C) \\
 & = A \cap (B \cap C)^c \\
 & = A \cap (B^c \cup C^c) \\
 & = (A \cap B^c) \cup (A \cap C^c) \\
 & = (A - B) \cup (A - C)
 \end{aligned}$$

$$\begin{aligned}
 61. \quad & (A - B) \cup A^c \\
 & = (A \cap B^c) \cup A^c \\
 & = (A \cup A^c) \cap (B^c \cup A^c) \\
 & = U \cap (B^c \cup A^c) \\
 & = B^c \cup A^c \\
 & = A^c \cup B^c \\
 & = (A \cap B)^c
 \end{aligned}$$

$$\begin{aligned}
 62. \quad & (A - B) - C \\
 & = (A \cap B^c) \cap C^c \\
 & = A \cap (B^c \cap C^c) \\
 & = A \cap (B \cup C)^c \\
 & = A - (B \cup C)
 \end{aligned}$$

$$\begin{aligned}
 63. \quad & (A-B) \cup (A \cap C) \downarrow \square \\
 & = (A \cap B^c) \cup (A \cap C) \downarrow \square \\
 & = A \cap (B^c \cup C) \downarrow \square \\
 & = A \cap (B \cap C^c)^c \downarrow \square \\
 & = A - (B \cap C^c) \downarrow \square \\
 & = A - (B - C)
 \end{aligned}$$

64.

$$\begin{aligned}
 & (A \cup B) \cap (A^c \cap B^c) \quad \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = (A \cup B) \cap (A \cup B)^c \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = (A \cup B) - (A \cup B) \\
 & = \emptyset
 \end{aligned}$$

65.

$$\begin{aligned}
 & A - (A - B) \\
 & = A \cap (A \cap B^c)^c \quad \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = A \cap \{A^c \cup (B^c)^c\} \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = A \cap (A^c \cup B) \quad \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = (A \cap A^c) \cup (A \cap B) \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = \emptyset \cup (A \cap B) \\
 & = A \cap B
 \end{aligned}$$

66.

$$\begin{aligned}
 & (A \cap B) \cap (A^c \cap B^c) \quad \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = A \cap (B \cap A^c) \cap B^c \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = A \cap (A^c \cap B) \cap B^c \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = (A \cap A^c) \cap (B \cap B^c) \quad \leftarrow \begin{array}{|c|c|} \hline & \\ \hline \end{array} \\
 & = \emptyset \cap \emptyset \\
 & = \emptyset
 \end{aligned}$$

■ 전체집합 $U = \{1, 2, 3, 4, 5, 6, 7\}$ 의 두 부분집합 $A = \{1, 3, 5, 7\}$, $B = \{3, 4, 5\}$ 에 대하여 다음을 구하여라.

67. $(A \cap B)^c$

68. $A^c \cup B^c$

69. $(A \cup B)^c$

70. $A^c \cap B^c$

71. $(A \cup B^c)^c$

72. $(A \cap B^c)^c$

73. $(A^c \cup B)^c$

74. $(A^c \cap B)^c$

■ 전체집합 $U = \{1, 2, 3, 4, 5, 6, 7\}$ 의 두 부분집합 $A = \{1, 2, 3, 6\}$, $B = \{2, 4, 6\}$ 에 대하여 다음을 구하여라.

75. $(A \cap B)^c$

76. $A^c \cup B^c$

77. $(A \cup B)^c$

78. $A^c \cap B^c$

79. $(A \cup B^c)^c$

80. $(A \cap B^c)^c$

81. $(A^c \cup B)^c$

82. $(A^c \cap B)^c$

■ 전체집합 $U = \{1, 2, 3, 4, 5\}$ 의 두 부분집합 A, B 에 대하여 $A = \{2, 3, 5\}$, $B = \{1, 2, 5\}$ 일 때, 다음을 구하여라.

83. $(A \cap B)^c$

84. $A^c \cup B^c$

85. $(A \cup B)^c$

86. $A^c \cap B^c$

87. $(A \cup B^c)^c$

88. $(A \cap B^c)^c$

89. $(A^c \cup B)^c$

90. $(A^c \cap B)^c$

■ 전체집합 $U = \{1, 2, 3, 4, 5, 6\}$ 이 두 부분집합 $A = \{2, 4\}$, $B = \{1, 2, 4, 6\}$ 에 대하여 다음을 구하여라.

91. $A \cap B$

92. $A \cup B$

93. $A - (A \cap B)$

94. $(A \cup B) - B$

95. $A \cap B^c$

96. $B^C - A^C$



정답 및 해설

1) A

2) A

3) A

4) \emptyset

5) A

6) A

7) A

8) \emptyset

9) U

10) A

11) U

12) \emptyset

13) B

14) U

15) \emptyset 16) $A^c \cap B$

$$\Rightarrow (A \cup B^c)^c = A^c \cap (B^c)^c = A^c \cap B$$

17) $A^c \cup B$

$$\Rightarrow (A \cap B^c)^c = A^c \cup (B^c)^c = A^c \cup B$$

18) $A \cap B^c$

$$\Rightarrow (A^c \cup B)^c = (A^c)^c \cap B^c = A \cap B^c$$

19) $A \cup B^c$

$$\Rightarrow (A^c \cap B)^c = (A^c)^c \cup B^c = A \cup B^c$$

20) $A \cap B$

$$\Rightarrow (A^c \cup B^c)^c = (A^c)^c \cap (B^c)^c = A \cap B$$

21) $A \cup B$

$$\Rightarrow (A^c \cap B^c)^c = (A^c)^c \cup (B^c)^c = A \cup B$$

22) \emptyset

$$\begin{aligned} \Rightarrow A \cap (B \cap A^c) &= A \cap (A^c \cap B) \\ &= (A \cap A^c) \cap B \\ &= \emptyset \cap B = \emptyset \end{aligned}$$

23) U

$$\Rightarrow A \cup (A \cap B)^c = A \cup (A^c \cup B^c)$$

$$= (A \cup A^c) \cup B^c$$

$$= U \cup B^c$$

$$= U$$

24) $B \cap A$

$$\begin{aligned} \Rightarrow (A^c \cup B) \cap A &= (A^c \cap A) \cup (B \cap A) \\ &= \emptyset \cup (B \cap A) = B \cap A \end{aligned}$$

25) $A \cup B^c$

$$\begin{aligned} \Rightarrow A \cup (A^c \cap B^c) &= (A \cup A^c) \cap (A \cup B^c) \\ &= U \cap (A \cup B^c) \\ &= A \cup B^c \end{aligned}$$

26) A

$$\begin{aligned} \Rightarrow (B^c - A)^c \cap A &= (B^c \cap A^c)^c \cap A \\ &= (B \cup A) \cap A = A \end{aligned}$$

27) A

$$\begin{aligned} \Rightarrow A - (A^c - B) &= A \cap (A^c \cap B^c)^c \\ &= A \cap \{(A^c)^c \cup (B^c)^c\} \\ &= A \cap (A \cup B) \\ &= A \end{aligned}$$

28) \emptyset

$$\begin{aligned} \Rightarrow (A - B) - A &= (A \cap B^c) - A \\ &= (A \cap B^c) \cap A^c \\ &= (B^c \cap A) \cap A^c \\ &= B^c \cap (A \cap A^c) \\ &= B^c \cap \emptyset \\ &= \emptyset \end{aligned}$$

29) U

$$\Rightarrow (A \cup B) \cup (A^c \cap B^c) = (A \cup B) \cup (A \cup B)^c = U$$

30) A

$$\begin{aligned} \Rightarrow (A \cup B) \cap (A \cup B^c) &= A \cup (B \cap B^c) \\ &= A \cup \emptyset = A \end{aligned}$$

31) B

$$\begin{aligned} \Rightarrow (A \cup B) \cap (A - B)^c &= (A \cup B) \cap (A \cap B^c)^c \\ &= (A \cup B) \cap \{A^c \cup (B^c)^c\} \\ &= (A \cup B) \cap (A^c \cup B) \\ &= (A \cap A^c) \cup B \\ &= \emptyset \cup B \\ &= B \end{aligned}$$

32) A

$$\begin{aligned} \Rightarrow (A - B) \cup (A - B^c) &= (A \cap B^c) \cup \{A \cap (B^c)^c\} \\ &= (A \cap B^c) \cup (A \cap B) \\ &= A \cap (B^c \cup B) \\ &= A \cap U \\ &= A \end{aligned}$$

33) ○

34) ×

$$\Rightarrow A - A^c = A \cap (A^c)^c = A \cap A = A$$

35) ○

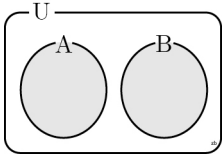
36) ○

$$\Rightarrow (A \cap B) \subset A \subset (A \cup B)$$

37) ×

$\Rightarrow A \cap B = \emptyset$ 일 때, $A \cup B$ 는 다음 그림에서 색칠한 부분과 같다.

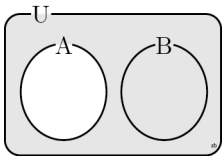
$$\therefore (A \cup B) \neq U$$



38) ×

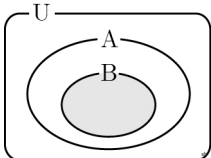
$\Rightarrow A \cap B = \emptyset$ 일 때, A^c 는 다음 그림에서 색칠한 부분과 같다.

$$\therefore B \subset A^c$$



39) ○

$\Rightarrow A \cup B = A$ 이면 $B \subset A$ 이므로 다음 그림에서 $A \cap B = B$



40) ×

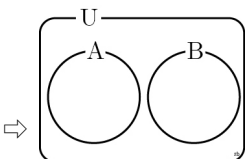
$\Rightarrow U = \{1, 2, 3, 4, 5\}$ 에 대하여
 $A = \{1, 2, 3\}$, $B = \{3, 4, 5\}$ 일 때,
 $A \cup B = U$ 이지만 $B \neq A^c$ 이다.

41) ○

$$\Rightarrow A \cap B^c = \emptyset \text{ 이면 } A - B = \emptyset$$

$$\therefore A \subset B$$

42) ×



위 그림과 같이 $A \cap B = \emptyset$ 이면 $A - B = A$ 이지만

$$B \neq \emptyset$$

43) B^c

$$\Rightarrow A - B = A \cap \boxed{B^c}$$

44) A^c

$$\Rightarrow B - A = B \cap \boxed{A^c}$$

45) B^c, B

$$\Rightarrow A - B^c = A \cap (\boxed{B^c})^c = A \cap \boxed{B}$$

46) B^c 47) A^c, A

$$\Rightarrow B - A^c = B \cap (\boxed{A^c})^c = B \cap \boxed{A}$$

48) A^c, A^c 49) U, A 50) \emptyset, \emptyset 51) $\cap, \cap, A^c \cup B$ 52) $A \cup A^c, U, U$ 53) $B^c, A \cap B, A \cap B, A \cap B$ 54) $A, A^c, \emptyset, B \cap A$ 55) B, \cap, U

$$\begin{aligned} \Rightarrow (A - B^c) \cup (B \cap C) &= \{A \cap (B^c)^c\} \cup (B \cap C) \\ &= (A \cap \boxed{B}) \cup (B \cap C) \\ &= (B \cap A) \cup (B \cap C) \\ &= B \cap (A \cup C) \end{aligned}$$

56) $A, \cap, B \cap C, B \cap C$

$$\begin{aligned} \Rightarrow (A \cap B^c) \cup (A^c \cup C)^c &= (A \cap B^c) \cup \{(A^c)^c \cap C^c\} \\ &= (A \cap B^c) \cup (\boxed{A} \cap C^c) \\ &= A \cap (B^c \cup C^c) \\ &= A \cap (\boxed{B \cap C})^c \\ &= A - (\boxed{B \cap C}) \end{aligned}$$

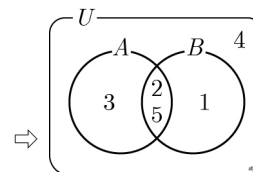
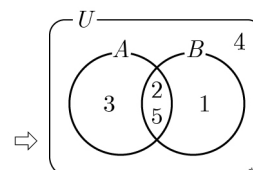
57) ○, ▮

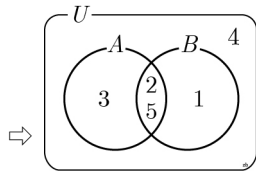
58) ○, ▮

59) □, ▮, ⊃

60) ○, ∨

61) ⊃, ∨, ⊃, □, ○

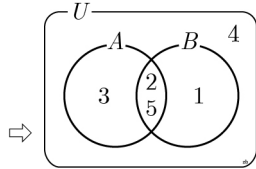
62) \bar{A}, \emptyset 63) $\bar{A}, \bar{B}, \emptyset, \bar{A} \cap \bar{B}$ 64) \emptyset 65) \emptyset, \bar{A} 66) $\bar{A}, \bar{B}, \bar{A} \cap \bar{B}$ 67) $\{1, 2, 4, 6, 7\}$ $\Rightarrow A \cap B = \{3, 5\}$ 이므로 $(A \cap B)^c = \{1, 2, 4, 6, 7\}$ 68) $\{1, 2, 4, 6, 7\}$ $\Rightarrow A^c \cup B^c = \{2, 4, 6\} \cup \{1, 2, 6, 7\}$ $= \{1, 2, 4, 6, 7\}$ 69) $\{2, 6\}$ $\Rightarrow A \cup B = \{1, 3, 4, 5, 7\}$ 이므로 $(A \cup B)^c = \{2, 6\}$ 70) $\{2, 6\}$ $\Rightarrow A^c \cap B^c = \{2, 4, 6\} \cap \{1, 2, 6, 7\}$ $= \{2, 6\}$ 71) $\{4\}$ $\Rightarrow (A \cup B)^c = A^c \cap (B^c)^c$ $= A^c \cap B$ $= \{2, 4, 6\} \cap \{3, 4, 5\}$ $= \{4\}$ 72) $\{2, 3, 4, 5, 6\}$ $\Rightarrow (A \cap B)^c = A^c \cup (B^c)^c$ $= A^c \cup B$ $= \{2, 4, 6\} \cup \{3, 4, 5\}$ $= \{2, 3, 4, 5, 6\}$ 73) $\{1, 7\}$ $\Rightarrow (A^c \cup B)^c = (A^c)^c \cap B^c$ $= A \cap B^c$ $= \{1, 3, 5, 7\} \cap \{1, 2, 6, 7\}$ $= \{1, 7\}$ 74) $\{1, 2, 3, 5, 6, 7\}$ $\Rightarrow (A^c \cap B)^c = (A^c)^c \cup B^c$ $= A \cup B^c$ $= \{1, 3, 5, 7\} \cup \{1, 2, 6, 7\}$ $= \{1, 2, 3, 5, 6, 7\}$ 75) $\{1, 3, 4, 5, 7\}$ $\Rightarrow A \cap B = \{2, 6\}$ 이므로 $(A \cap B)^c = \{1, 3, 4, 5, 7\}$ 76) $\{1, 3, 4, 5, 7\}$ $\Rightarrow A^c \cup B^c = \{4, 5, 7\} \cup \{1, 3, 5, 7\}$
 $= \{1, 3, 4, 5, 7\}$ 77) $\{5, 7\}$ $\Rightarrow A \cup B = \{1, 2, 3, 4, 6\}$ 이므로 $(A \cup B)^c = \{5, 7\}$ 78) $\{5, 7\}$ $\Rightarrow A^c \cap B^c = \{4, 5, 7\} \cap \{1, 3, 5, 7\}$
 $= \{5, 7\}$ 79) $\{4\}$ $\Rightarrow (A \cup B^c)^c = A^c \cap (B^c)^c$ $= A^c \cap B$ $= \{4, 5, 7\} \cap \{2, 4, 6\}$ $= \{4\}$ 80) $\{2, 4, 5, 6, 7\}$ $\Rightarrow (A \cap B^c)^c = A^c \cup (B^c)^c$ $= A^c \cup B$ $= \{4, 5, 7\} \cup \{2, 4, 6\}$ $= \{2, 4, 5, 6, 7\}$ 81) $\{1, 3\}$ $\Rightarrow (A^c \cup B)^c = (A^c)^c \cap B^c$ $= A \cap B^c$ $= \{1, 2, 3, 6\} \cap \{1, 3, 5, 7\}$ $= \{1, 3\}$ 82) $\{1, 2, 3, 5, 6, 7\}$ $\Rightarrow (A^c \cap B)^c = (A^c)^c \cup B^c$ $= A \cup B^c$ $= \{1, 2, 3, 6\} \cup \{1, 3, 5, 7\}$ $= \{1, 2, 3, 5, 6, 7\}$ 83) $\{1, 3, 4\}$  $\Rightarrow A \cap B = \{2, 5\}$ 이므로 $(A \cap B)^c = \{1, 3, 4\}$ 84) $\{1, 3, 4\}$  $\Rightarrow A^c \cup B^c = \{1, 4\} \cup \{3, 4\}$ $= \{1, 3, 4\}$ 85) $\{4\}$



$A \cup B = \{1, 2, 3, 5\}$ 이므로

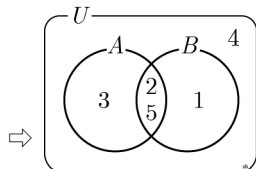
$$(A \cup B)^c = \{4\}$$

86) $\{4\}$



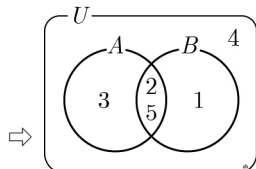
$$A^c \cap B^c = \{1, 4\} \cap \{3, 4\} = \{4\}$$

87) $\{1\}$



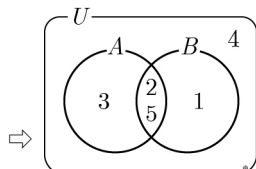
$$\begin{aligned} (A \cup B^c)^c &= A^c \cap (B^c)^c \\ &= A^c \cap B \\ &= \{1, 4\} \cap \{1, 2, 5\} \\ &= \{1\} \end{aligned}$$

88) $\{1, 2, 4, 5\}$



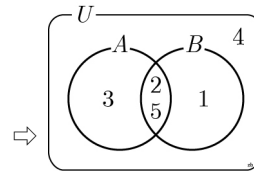
$$\begin{aligned} (A \cap B^c)^c &= A^c \cup (B^c)^c \\ &= A^c \cup B \\ &= \{1, 4\} \cup \{1, 2, 5\} \\ &= \{1, 2, 4, 5\} \end{aligned}$$

89) $\{3\}$



$$\begin{aligned} (A^c \cup B)^c &= (A^c)^c \cap B^c \\ &= A \cap B^c \\ &= \{2, 3, 5\} \cap \{3, 4\} \\ &= \{3\} \end{aligned}$$

90) $\{2, 3, 4, 5\}$



$$\begin{aligned} (A^c \cap B)^c &= (A^c)^c \cup B^c \\ &= A \cup B^c \\ &= \{2, 3, 5\} \cup \{3, 4\} \\ &= \{2, 3, 4, 5\} \end{aligned}$$

91) A

$$\Rightarrow A \cap B = \{2, 4\} = A$$

92) B

$$\Rightarrow A \cup B = \{1, 2, 4, 6\} = B$$

93) \emptyset

$$\Rightarrow A - (A \cap B) = A - A = \emptyset$$

94) \emptyset

$$\Rightarrow (A \cup B) - B = B - B = \emptyset$$

95) \emptyset

$$\Rightarrow A \cap B^c = A - B = \emptyset$$

96) \emptyset

$$\Rightarrow B^c - A^c = \{3, 5\} - \{1, 3, 5, 6\} = \emptyset$$