

1 集合と命題

P28

- 1 (1) $\in$ (2) $\notin$ (3) $\notin$ (4) $\in$
 2 (1) $\in$ (2) $\in$ (3) $\notin$ (4) $\notin$
 3 (1) $\{11, 22, 33, 44\}$ (2) $\{1, 2, 3, 4, 6, 8, 12, 16, 24, 48\}$ (3) $\{2, 6, 10, 14, \dots, 298\}$
 4 (1) $\{x|x \text{ は自然数}\}$ (2) $\{x|x \text{ は正の奇数}\}$ [別解] $\{2x-1|x \text{ は自然数}\}$
 (3) $\{x|x \text{ は99以下の自然数で3の倍数}\}$ [別解] $\{3x|x \text{ は整数, } 1 \leq x \leq 33\}$
 (4) $\{x|x \text{ は19以下の素数}\}$

P29

- 5 (1) $A \subset B$ (2) $B \subset A$ (3) $A = B$ (4) $B \subset A$
 6 (1) $A \cap B = \{2, 5, 8\}$ (2) $A \cup B = \{1, 2, 3, 4, 5, 7, 8\}$ (3) $A \cap C = \{2, 8\}$
 (4) $B \cap C = \{2, 4, 8\}$ (5) $A \cap B \cap C = \{2, 8\}$ (6) $A \cup B \cup C = \{1, 2, 3, 4, 5, 6, 7, 8, 10\}$
 7 (1) $A \cap B = \{6, 12, 18\}$
 (2) $A \cup B = \{2, 3, 4, 6, 8, 9, 10, 12, 14, 15, 16, 18, 20, 21, 24, 27, 30\}$
 (3) $B \cap C = \{3, 9, 15, 21, 27\}$
 8 $A \cap B = \{x|-3 < x \leq -1\}$, $A \cup B = \{x|x < 2\}$

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- 9 (1) $\emptyset, \{3\}, \{5\}, \{7\}, \{3, 5\}, \{3, 7\}, \{5, 7\}, \{3, 5, 7\}$
 (2) $\emptyset, \{1\}, \{3\}, \{5\}, \{15\}, \{1, 3\}, \{1, 5\}, \{1, 15\}, \{3, 5\}, \{3, 15\}, \{5, 15\}, \{1, 3, 5\},$
 $\{1, 3, 15\}, \{1, 5, 15\}, \{3, 5, 15\}, \{1, 3, 5, 15\}$
 (3) $\emptyset, \{11\}, \{16\}, \{11, 16\}$
 10 (1) $A = \{15, 18\}$ (2) $B = \{15, 20\}$ (3) $\bar{A} = \{16, 17, 19, 20\}$ (4) $\bar{B} = \{16, 17, 18, 19\}$
 (5) $\bar{A} \cup \bar{B} = \{15, 16, 17, 19, 20\}$ (6) $\bar{A} \cap \bar{B} = \{20\}$ (7) $A \cup \bar{B} = \{15, 16, 17, 18, 19\}$
 (8) $A \cap \bar{B} = \{18\}$
 11 (1) $\bar{A} = \{x|x < 1, 5 < x\}$ (2) $\bar{B} = \{x|-2 \leq x \leq 3\}$ (3) $\bar{A} \cap \bar{B} = \{x|x < -2, 5 < x\}$
 (4) $A \cup \bar{B} = \{x|-2 \leq x \leq 5\}$

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- 12 (1) $A \cup B = \{2, 3, 4, 6, 8, 9, 10\}$ (2) $A \cap B = \{6\}$ (3) $\bar{A} = \{1, 3, 5, 7, 9\}$
 (4) $\bar{B} = \{1, 2, 4, 5, 7, 8, 10\}$ (5) $\bar{A} \cup \bar{B} = \bar{A} \cap \bar{B} = \{1, 2, 3, 4, 5, 7, 8, 9, 10\}$
 (6) $\bar{A} \cap \bar{B} = \bar{A} \cup \bar{B} = \{1, 5, 7\}$
 13 (1) $A \cap B = \{12, 18\}$ (2) $\bar{A} = \{11, 13, 15, 17, 19\}$ (3) $\bar{A} \cap \bar{B} = \{15\}$ (4) $A \cap \bar{B} = \{10, 14, 16, 20\}$
 (5) $\bar{A} \cup \bar{B} = \bar{A} \cap \bar{B} = \{10, 11, 13, 14, 15, 16, 17, 19, 20\}$
 (6) $A \cup B = \{10, 12, 14, 15, 16, 18, 20\}$ より, $\bar{A} \cap \bar{B} = \overline{A \cup B} = \{11, 13, 17, 19\}$
 14 $A = \{1, 3, 5, 7, 9, 11\}$, $B = \{3, 6, 9, 12\}$, $C = \{2, 3, 5, 7, 11\}$ である.
 (1) $B \cap C = \{3\}$ より, $\bar{B} \cup \bar{C} = \overline{B \cap C} = \{n|n \neq 3, n \in U\}$ だから, $A \cap (\bar{B} \cup \bar{C}) = \{1, 5, 7, 9, 11\}$
 (2) $\bar{A} = \{2, 4, 6, 8, 10, 12\}$, $B \cup C = \{2, 3, 5, 6, 7, 9, 11, 12\}$ より, $\bar{B} \cap \bar{C} = \overline{B \cup C} = \{1, 4, 8, 10\}$
 よって, $\bar{A} \cup (\bar{B} \cap \bar{C}) = \{1, 2, 4, 6, 8, 10, 12\}$
 15 (1) $A \cap B = \{x|-3 \leq x < -1\}$ (2) $A \cup B = \{x|-5 < x \leq 1, 3 < x < 5\}$
 (3) $\bar{A} = \{x|-5 < x < -3, 1 < x < 5\}$ (4) $\bar{A} \cap \bar{B} = \{x|-5 < x < -3, 3 < x < 5\}$
 (5) $\bar{A} \cup \bar{B} = \bar{A} \cap \bar{B} = \{x|-5 < x < -3, -1 \leq x < 5\}$
 (6) $\bar{A} \cap \bar{B} = \bar{A} \cup \bar{B} = \{x|1 < x \leq 3\}$
 16 (1)50 (2)33 (3)16 (4)50 (5)67 (6) $n(A \cup B) = n(A) + n(B) - n(A \cap B) = 50 + 33 - 16 = 67$
 (7) $n(\bar{A} \cup \bar{B}) = n(\bar{A} \cap \bar{B}) = n(U) - n(A \cap B) = 100 - 16 = 84$
 (8) $n(\bar{A} \cap \bar{B}) = n(\bar{A} \cup \bar{B}) = n(U) - n(A \cup B) = 100 - 67 = 33$