Name: Đào Minh Đức student ID: 2159003 class: CS2065 - 21

Page 125

10) ⓐ True ⓔ True
ⓑ True ⓕ True
ⓒ False ⓖ True
ⓓ True

33) ⓐ $A^2 = \{(0,0), (0,1), (0,3), (1,0), (1,1), (1,3), (3,0), (3,1), (3,3)\}$

ⓑ $A^2 = \{(1,1), (1,2), (1,a), (1,b), (2,1), (2,2), (2,a), (2,b), (a,1), (a,2), (a,a), (a,b), (b,1), (b,2), (b,a), (b,b)\}$

43) ⓐ $P(x): x^2 < 3 \Leftrightarrow x^2 - 3 < 0 \Leftrightarrow (x-\sqrt{3})(x+\sqrt{3}) < 0$

$$\Rightarrow \begin{cases} x-\sqrt{3} < 0 \\ x+\sqrt{3} > 0 \end{cases} \text{ or } \begin{cases} x-\sqrt{3} > 0 \\ x+\sqrt{3} < 0 \end{cases} \Leftrightarrow \begin{cases} x < \sqrt{3} \\ x > -\sqrt{3} \end{cases} (1) \text{ or } \begin{cases} x > \sqrt{3} \\ x < -\sqrt{3} \end{cases} (2)$$

Since $x \in \mathbb{Z} \Rightarrow$ (2) doesn't hold

(1) $\Rightarrow x \in \{-1, 0, 1\}$. Therefore the truth set of $P(x)$ is $\{-1, 0, 1\}$

ⓑ $Q(x): x^2 > x \Leftrightarrow x^2 - x > 0 \Leftrightarrow x(x-1) > 0$

$$\Rightarrow \begin{cases} x > 0 \\ x-1 < 0 \end{cases} \text{ or } \begin{cases} x < 0 \\ x-1 > 0 \end{cases} \Leftrightarrow \begin{cases} x > 0 \\ x < 1 \end{cases} (1) \text{ or } \begin{cases} x < 0 \\ x > 1 \end{cases} (2)$$

Since $x \in \mathbb{Z} \Rightarrow$ (2) doesn't hold

(1) $\Rightarrow x \in \{\dots, -2, -1,$

17) @ $x \in \overline{A \cap B \cap C} \equiv \overline{(x \in A) \wedge (x \in B) \wedge (x \in C)}$

$\equiv \neg (x \in A \wedge x \in B \wedge x \in C)$

$\equiv x \notin A \vee x \notin B \vee x \notin C$

$x \in \bar{A} \cup \bar{B} \cup \bar{C} \equiv x \notin A \vee x \notin B \vee x \notin C$

$\Rightarrow \overline{A \cap B \cap C} = \bar{A} \cup \bar{B} \cup \bar{C}$

@

A	B	C	$\bar{A}$	$\bar{B}$	$\bar{C}$	$A \cap B \cap C$	$\overline{A \cap B \cap C}$	$\bar{A} \cup \bar{B} \cup \bar{C}$
1	1	1	0	0	0	1	0	0
1	1	0	0	0	1	0	1	1
1	0	1	0	1	0	0	1	1
1	0	0	0	1	1	0	1	1
0	1	1	1	0	0	0	1	1
0	1	0	1	0	1	0	1	1
0	0	1	1	1	0	0	1	1
0	0	0	1	1	1	0	1	1

Therefore $\overline{A \cap B \cap C} = \bar{A} \cup \bar{B} \cup \bar{C}$

18) @ $x \in (A - C) \equiv x \in A \wedge x \notin C$

$x \in (C - B) \equiv x \in C \wedge x \notin B$

$x \in (A - C) \cap (C - B) \equiv (x \in A \wedge x \notin C) \wedge (x \in C \wedge x \notin B)$

$\equiv x \in A \wedge x \in \emptyset \wedge x \notin B \equiv x \in \emptyset$

Therefore $(A - C) \cap (C - B) = \emptyset$

@ $x \in (B - A) \equiv x \in B \wedge x \notin A$

$x \in (C - A) \equiv x \in C \wedge x \notin A$

$x \in (B - A) \cup (C - A) \equiv (x \in B \wedge x \notin A) \vee (x \in C \wedge x \notin A)$

$\equiv x \notin A \wedge (x \in B \vee x \in C)$ (1)

$x \in (B \cup C) - A \equiv (x \in B \vee x \in C) \wedge x \notin A$ (2)

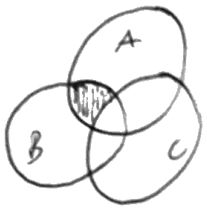
From (1), (2): $(B - A) \cup (C - A) = (B \cup C) - A$

Student ID: 2155003

14) $A = \{1, 5, 7, 8, 3, 6, 9\}$

$B = \{2, 10, 3, 6, 9\}$

27) ⓐ



ⓑ

ⓒ

52) ⓐ 00111100000

ⓑ 10100100001

ⓒ 01110011110

53) ⓐ $\{1, 2, 3, 4, 7, 8, 9, 10\}$

ⓑ $\{2, 4, 5, 6, 7\}$

ⓒ $\{1, 10\}$

3) ⓐ $A \cup B = \{3\}\ \{1, 2, 3, 4, 5, 0, 6\}$

ⓑ $A \cap B = \{3\}$

ⓒ $A - B = \{1, 2, 4, 5\}$

ⓓ $B - A = \{0, 6\}$