清华大学 Tsinghua University

数学作业纸

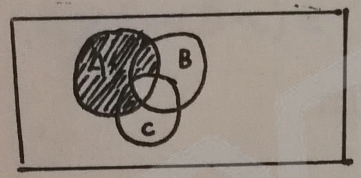
班级 计71 姓名 张程远 编号 2017011429 科目 离散 第 页

T8 $B = P(P(\{\phi\})) = P(\phi, \{\phi\}) = \{\phi, \{\phi\}, \{\{\phi\}\}, \{\phi, \{\phi\}\}\}$.

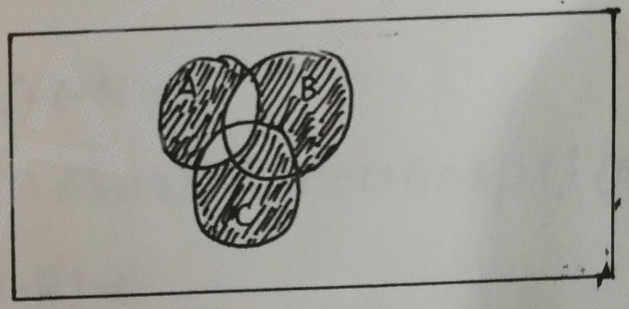
(1) 是；是 (2) 是；是 (3) 是；是

T9

(2).



(3)



T10. (1) $(B \cap C) - A$ (2) $(-(A \cup B \cup C)) \cup (A \cap B \cap C)$

T11 (1) $\phi \wedge \{\phi\} = \phi$； (2) $\{\phi, \{\phi\}\} - \phi = \{\phi, \{\phi\}\}$；

(3) $\{\phi, \{\phi\}\} - \{\phi\} = \{\{\phi\}\}$； (4) $\{\{\phi\}, \phi\} - \{\{\phi\}\} = \{\phi\}$.

T12 (3) $-(A\cap B)=\{1,2,3,4,5\}-\{1\}=\{2,3,4,5\}$;

(5) $P(A)=\{\phi,\{1\},\{4\},\{1,4\}\}$ $P(B)=\{\phi,\{1\},\{2\},\{5\},\{1,2\},\{2,5\},\{1,5\},\{1,2,5\}\}$

$P(A)-P(B)=\{\{4\},\{1,4\}\}$.

T13 (3): $A\cup C=\{0,1,2,3,6,7,8,9,12,15,18\}$.

$B-(A\cup C)=\{4,5\}$.

T15 (1) 原式 $=\cup\{\{\phi,\{\phi\}\},\{\{\phi\}\},\{\phi,\{\phi\}\}\},\{\phi,\{\phi\}\},\{\phi\},\phi\}$.

$=\{\phi,\{\phi\},\{\{\phi\}\},\{\phi,\{\phi\}\}\}$.

(2) 原式 $=\cap\{\{\phi,\{\phi\}\},\{\{\phi\}\},\{\phi,\{\phi\}\}\},\{\phi,\{\phi\}\},\{\phi\}\}$

$=\{\phi\}$.

11.

(1) $A-(B\cup C)=(A-B)\cap(A-C)=(A\cap\sim B)\cap(A\cap\sim C)=A\cap(\sim B)\cap(\sim C)$

$=(A-B)\cap(\sim C)=(A-B)-C.$

(2) $(A-C)-(B-C)=(A\cap\sim C)\cap\sim(B\cap\sim C)$

$=(A\cap\sim C)\cap(\sim B\cup C)=(A\cap\sim C\cap\sim B)\cup\underbrace{(A\cap\sim C\cap C)}_{\phi}$

$=(A-B)-C$

(3).

① $A=B\Rightarrow(A-B)\cup(B-A)=\phi\Rightarrow A\oplus B=\phi;$

② $A\oplus B=\phi\Rightarrow(A-B)\cup(B-A)=\phi\Rightarrow A-B=\phi\wedge B-A=\phi.$

$\Rightarrow A\subseteq B\wedge B\subseteq A\Rightarrow A=B$

(4). ①若 $A\subseteq C\wedge B\subseteq C$ 成立. $\forall x,\ x\in A\cup B\Leftrightarrow x\in A\vee x\in B\Rightarrow x\in C;$

②若 $A\cup B\subseteq C,\ \forall x,\ x\in A\Rightarrow x\in A\cup B\Rightarrow x\in C;$ $\therefore A\subseteq C\wedge B\subseteq C.$

$x\in B\Rightarrow x\in A\cup B\Rightarrow x\in C;$

综上, $A\subseteq C\wedge B\subseteq C\Leftrightarrow A\cup B\subseteq C.$

(5). ①若 $C\subseteq A\wedge C\subseteq B$ 成立, $\forall x\in C\Rightarrow x\in A\wedge x\in B\Rightarrow x\in A\cap B;\Rightarrow C\subseteq A\cap B$

②若 $C\subseteq A\cap B$ 成立, $\forall x\in C\Rightarrow x\in A\cap B\Rightarrow x\in A\wedge x\in B.\Rightarrow C\subseteq A\wedge C\subseteq B.$

综上, $C\subseteq A\wedge C\subseteq B\Leftrightarrow C\subseteq A\cap B.$

(6). ① $A\cap B=\phi$ 成立, $\forall x\in A,\ x\in A\Rightarrow x\in A-(A\cap B)\Rightarrow x\in\sim(A\cap B)\Rightarrow x\in\sim B$

② $A\subseteq\sim B$ 成立, $\forall x\in B,\ x\in B\Rightarrow x\notin\sim B\Rightarrow x\notin A\Rightarrow x\in\sim A.$

③ $B\subseteq\sim A$ 成立. $\forall x\in B\Rightarrow x\in\sim A\Rightarrow x\notin A\Rightarrow A\cap B=\phi.$

综上, $A\cap B=\phi\Leftrightarrow A\subseteq\sim B\Leftrightarrow B\subseteq\sim A.$

Tsinghua University 数学作业纸

班级 姓名 编号 科目 第

T18 (1) $A-B=B \Rightarrow B$为$\phi \Rightarrow A-\phi=\phi \Rightarrow A=\phi=B$

(2) $A=B$ (3) $A=B$

(4) $A \oplus B=A \Rightarrow B-A=B \cap A \Rightarrow B=\phi$.

T19 (1) $\Leftrightarrow (A \cap B) \wedge (A \cap C)=\phi \Leftrightarrow A \cap B \cap C=\phi$.

(2) $\Leftrightarrow A \subseteq B \wedge A \subseteq C \Leftrightarrow A \subseteq (B \cap C)$

(3) $A \subseteq (B \cup C)$

(4). $A-B=A-C$.

T26: (1) $A=\phi \vee B=\phi$. 若A.B均非空 则 $A \times B$ 有元素. 非空.

(2) $A=\phi$为$A=A \times A$ 充要条件.

T28: $A_1=\{x \mid 1 \le x \le 250$ 且 x可被2整除$\}$.

$A_2=\{x \mid 1 \le x \le 250$ 且x可被3整除$\}$

$A_3=\{x \mid 1 \le x \le 250$ 且x可被5整除$\}$

$|A_1|+|A_2|+|A_3|-|A_1 \cap A_2|-|A_2 \cap A_3|-|A_1 \cap A_3|+|A_1 \cap A_2 \cap A_3|$

$=125+83+50-41-25-16+8=184$个