13.(3) $A=\{1,2,7,8\}$

$B=\{x \mid x^2<50\}=\{0,1,2,3,4,5,6,7\}$

$C=\{x \mid 0\le x\le 20 \wedge x \text{可被3整除}\}$

$=\{0,3,6,9,12,15,18\}$.

$B-(A\cup C)=\{0,1,2,3,4,5,6,7\}$

$-\{0,1,2,3,6,7,8,9,12,15,18\}$

$=\{4,5\}$.

14.(1) $\cup\{\{3,4\},\{\{3\},\{4\}\},\{3,\{4\}\},\{\{3\},4\}\}$.

$=\{3,4,\{3\},\{4\}\}$

(2) $\cap\{\{1,2,3\},\{2,3,4\},\{3,4,5\}\}$

$=\{3\}$

15. $P(\phi)=\{\phi\}$, $PP(\phi)=\{\phi,\{\phi\}\}$

$PPP(\phi)=\{\phi,\{\phi\},\{\{\phi\}\},\{\phi,\{\phi\}\}\}$

(1) $\cup\{PPP(\phi),PP(\phi),P(\phi),\phi\}$

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

(2) $\cap\{PPP(\phi),PP(\phi),P(\phi)\}$

$=\{\phi\}$

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

(1) $P(A)=\{\phi,\{\{\phi\}\},\{\{\{\phi\}\}\},\{\{\phi\},\{\{\phi\}\}\}\}$

$\cup P(A)=A=\{\{\phi\},\{\{\phi\}\}\}$.

(2) $\cup A=\{\phi,\{\phi\}\}$.

$P(\cup A)=\{\phi,\{\phi\},\{\{\phi\}\},\{\phi,\{\phi\}\}\}$.

17. (2) $LHS = (A-B)-C$

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

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

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

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

$= A \cap C - C \cap C-B \cup C))$

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

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

(4)

充分性：

必要性：

$A \subseteq C \wedge B \subseteq C \Rightarrow (A \cup B) \subseteq (C \cup C) \Rightarrow (A \cup B) \subseteq C$

$A \cup B \subseteq C \Leftrightarrow (\forall x)((x \in A \vee x \in B) \rightarrow x \in C)$

$\Leftrightarrow (\forall x)((x \in A \rightarrow x \in C) \wedge (x \in B \rightarrow x \in C))$

$\Leftrightarrow (\forall x)(x \in A \rightarrow x \in C) \wedge (\forall x)(x \in B \rightarrow x \in C)$

$\Leftrightarrow A \subseteq C \wedge B \subseteq C$

18. (1) $A - B = B$

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

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

$= \emptyset$

$A = A - \emptyset = A - B = B = \emptyset$

故 $A = B = \emptyset$.

(3) $A \cap B = A \cup B$

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

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

故 $A = B$.

19. (2) $(A-B)\cup(A-C)=\emptyset$

$\Leftrightarrow (A\cap -B)\cup(A\cap -C)=\emptyset$

$\Leftrightarrow A\cap(-B\cup -C)=\emptyset$

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

$\Leftrightarrow A\subseteq B\cap C$.

(4) $(A-B)\oplus(A-C)=\emptyset$

$\Leftrightarrow ((A-B)-(A-C))\cup((A-C)-(A-B))=\emptyset$

$\Leftrightarrow (A-B)-(A-C)=\emptyset \wedge (A-C)-(A-B)=\emptyset$

$\Leftrightarrow (A-B)\subseteq(A-C)\wedge(A-C)\subseteq(A-B)$

$\Leftrightarrow A-B=A-C$.

26. (1) $A\times B=\emptyset$

$\Leftrightarrow \{\langle x,y\rangle \mid x\in A, y\in B\}=\emptyset$

$\Leftrightarrow A=\emptyset \vee B=\emptyset$.

(2) $A=A\times A \Leftrightarrow A=\emptyset$.

28. A, B, C 分别表示 1~250 之间能被 2, 3, 5 整除的数.

$|A|=250/2=125$

$|B|=250/3=83$.

$|C|=250/5=50$.

$|A\cap B|=250/6=41$.

$|A\cap C|=250/10=25$

$|B\cap C|=250/15=16$.

$|A\cap B\cap C|=250/30=8$.

$|A\cup B\cup C|=|A|+|B|+|C|-|A\cap B|-|A\cap C|-|B\cap C|+|A\cap B\cap C|$

$=125+83+50-41-25-16+8=184$.