离散数学 第八周作业

1. (4) $A_4 = \{\{-2,0\},\{-1,0\},\{0,0\},\{-2,1\},\{-1,1\},\{0,1\},\{1,1\},\{-2,2\},\{-1,2\},\{0,2\},\{1,2\}\}$

2. (4) $\{x \mid x$是素数$\wedge x \neq 2\}$

3. $A=\{1\}$ $B=\{\{1\}\}$, $C=\{\{\{1\}\}\}$
   则 $A \in B$. $B \in C$ 但 $A \notin C$

4. $A=\{1\}$ $B=\{\{1\}\}$ $C=\{\{1\},\{\{1\}\}\}$
   则 $A \in B$. $B \in C$ 且 $A \in C$

6. (1) 真，证明如下
   $B \subseteq C$ 则 $(\forall x)(x \in B \to x \in C)$
   而 $A \in B$ 则 $A \in C$

   (2) 假，反例如下
   $A=\{1\}$ $B=\{\{1\}\}$ $C=\{\{1\}\}$
   则 $A \in B$且$B \subseteq C$ 但 $A \notin C$

   (3) 假，反例如下
   $A=\{1\}$ $B=\{1,2\}$ $C=\{\{1,2\}\}$
   则 $A \subseteq B$且 $B \in C$ 但$A \notin C$

   (4) 假，反例如下
   $A=\{1\}$ $B=\{\{1\},\{2\}\}$ $C=\{\{1\}\}$
   则 $A \in B$ 且$B \notin C$，且 $A \in C$

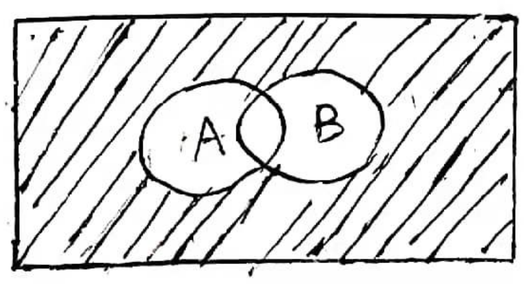
7. (1) 幂集 $\{\phi,\{a\},\{\{a\}\},\{a,\{a\}\}\}$

   (3) 幂集 $\{\phi,\{\phi\},\{a\},\{\{b\}\},\{\phi,a\},\{\phi,\{b\}\},\{a,\{b\}\},\{\phi,a,\{b\}\}\}$

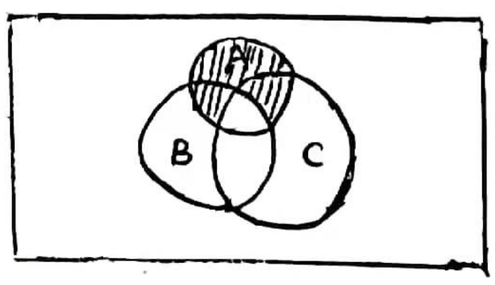
   (5) $P(P(\phi)) = P(\{\phi\}) = \{\phi,\{\phi\}\}$
   $P(P(\phi)) \times P(P(\phi)) = \{\phi,\{\phi\}\} \times \{\phi,\{\phi\}\}$
   $= \{<\phi,\phi>,<\phi,\{\phi\}>,<\{\phi\},\phi>,<\{\phi\},\{\phi\}>\}$

8. $B = P(P(P(\phi))) = P(P(\{\phi\})) = P(\{\phi,\{\phi\}\}) = \{\phi,\{\phi\},\{\{\phi\}\},\{\phi,\{\phi\}\}\}$
   (1) $\phi \in B$, $\phi \subseteq B$
   (2) $\{\phi\} \in B$, $\{\phi\} \subseteq B$
   (3) $\{\{\phi\}\} \in B$, $\{\{\phi\}\} \subseteq B$

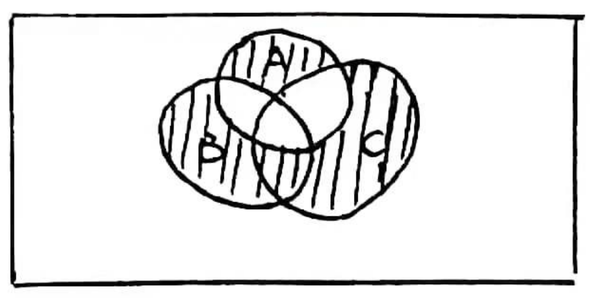
9. (1)



(2)



(3)



10. (1) $(B \cap C) - A$

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

11. (1) $\phi \cap \{\phi\} = \phi$

(2) $\{\phi, \{\phi\}\} - \phi = \{\phi, \{\phi\}\}$

(3) $\{\phi, \{\phi\}\} - \{\phi\} = \{\{\phi\}\}$

(4) $\{\phi, \{\phi\}\} - \{\{\phi\}\} = \{\phi\}$

12. (1) $A \cap -B = \{1,4\} \cap \{3,4\} = \{4\}$

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

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

$= \{\{4\}, \{1,4\}\}$