离散数学(1). Week 8.

Date 2021. 11. 05

9.1 - 9.4

1(4). 2(4).
3, 4, 6, 7(2,3,5), 8, 9(1,3),
10, 11, 12(2)(5).

1(4).
$A_4 = \{z \mid z = \{x, y\} \wedge x \in \mathbb{Z} \wedge y \in \mathbb{Z} \wedge 0 \le x \le 2 \wedge -2 \le y \le 1\}$.

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

2(4). $\{3, 5, 7, 11, 13, \ldots\}$.
$= \{p \mid p \in \mathbb{Z}_+ \wedge p > 2 \wedge (\forall r)(\forall s)(((r \in \mathbb{Z}_+ \wedge s \in \mathbb{Z}_+ \wedge p = rs) \to (r = 1 \vee s = 1))\}$.

3. $A \in B$, $B \in C$, $A \notin C$.
$A = \{a\}$, $B = \{\{a\}\}$, $C = \{\{\{a\}\}\}$.

4. $A \in B$, $B \in C$, $A \in C$.
$A = \{a\}$, $B = \{\{a\}\}$,
$C = \{\{a\}, \{\{a\}\}\}$.

6(1) 真 (2). 假 (3). 假 (4). 假.

(1) 的证明:
~~设 取 然~~.
① $B \subseteq C$, ~~即~~ ②. $A \in B$.
$\Leftrightarrow (\forall b)(b \in B \to b \in C)$
$\Rightarrow (A \in B \to A \in C)$.

(2) 的反例.
$A = \{1\}$, $B = \{\{1\}\}$,
$C = \{\{1\}, \{2\}\}$.
但 $1 \notin C$, 故 $A \notin C$.

(幂集).
7(2). $P(\{\{1, \{2\}\}\})$
$= \{\emptyset, \{\{1, \{2\}\}\}\}$.

7(3). $P\{\emptyset, a, \{b\}\}$
$= \{\emptyset, \{\emptyset\}, \{a\}, \{\{b\}\}, \{\emptyset, a\}, \{\emptyset, \{b\}\}, \{a, \{b\}\}, \{\emptyset, a, \{b\}\}\}$.

7(5). $P(P(\emptyset))^2$.
$P(\emptyset) = \{\emptyset\}$.
$P(P(\emptyset)) = \{\emptyset, \{\emptyset\}\}$.
$P(P(\emptyset))^2 = \{\langle\emptyset,\emptyset\rangle, \langle\emptyset,\{\emptyset\}\rangle, \langle\{\emptyset\},\emptyset\rangle, \langle\{\emptyset\},\{\emptyset\}\rangle\}$.

8. $B = P(P(P(\emptyset)))$

$= P(\{\emptyset, \{\emptyset\}\})$

$= \{\emptyset, \{\emptyset\}, \{\{\emptyset\}\}, \{\emptyset, \{\emptyset\}\}\}$.

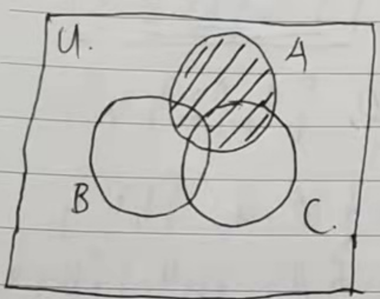
(1). 皆是.

(2). 皆是.

(3). 皆是.

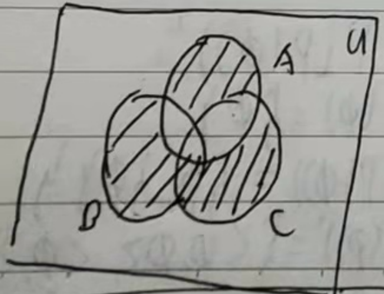
9.(2). $A \cap (-B \cup -C)$.

*定义U为全集.

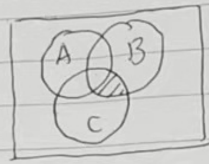


(3). $A \oplus (B \cup C)$.

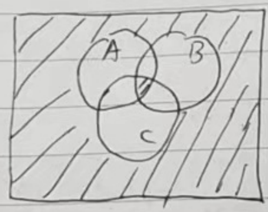
*定义U为全集



10.



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



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

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

(2). $\{\emptyset, \{\emptyset\}\} - \emptyset$

$= \{\emptyset, \{\emptyset\}\}$.

(3). $\{\emptyset, \{\emptyset\}\} - \{\emptyset\}$.

$= \{\{\emptyset\}\}$

(4). $\{\emptyset, \{\emptyset\}\} - \{\{\emptyset\}\}$

$= \{\emptyset\}$.

12. $E = \{1,2,3,4,5\}$.

$A = \{1,4\}$, $B = \{1,2,5\}$, $C = \{2,4\}$.

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

13.

(5). $P(A) - P(B)$

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

$P(B) = \{\emptyset, \{1\}, \{2\}, \{5\}, \{1,2\}, \{1,5\}, \{2,5\}, \{1,2,5\}\}$.

$P(A) - P(B)$

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