

1. 确定下列命题是否为真

- (1) $\emptyset \subseteq \{\emptyset\}$ (2) $\{\emptyset\} \subseteq \{\{\emptyset\}\}$ (3) $\{\emptyset\} \in \{\{\emptyset\}\}$
(4) $\{a, b\} \in \{a, b, c, \{a, b, c\}\}$ (5) $\{a, b\} \in \{a, b, c, \{\{a, b\}\}\}$

2. 写出下列集合的幂集笛卡尔集

- (1) $\{a, \{a\}\}$ 的幂集 (2) $\{\{1, \{2\}\}\}$ 的幂集
(3) $\{\emptyset, a, \{b\}\}$ 的幂集 (4) $\{a, b, c\} \times \{a, b\}$
(5) $P(P(\emptyset)) \times P(P(\emptyset))$

3. 设全集 $E = \{1, 2, 3, 4, 5\}$, 集合 $A = \{1, 4\}$, $B = \{1, 2, 5\}$, $C = \{2, 4\}$ 求

- (1) $(A \cap B) \cup -C$
(2) $P(A) \cap P(B)$
(3) $P(A) - P(B)$

4. 设 A, B, C 是任意集合, 证明

$$(1) (A - B) - C = (A - C) - (B - C)$$

$$(2) A = B \Leftrightarrow A \oplus B = \emptyset$$

$$(3) A \cap B = \emptyset \Leftrightarrow A \subseteq -B \Leftrightarrow B \subseteq -A$$