3. $A = \phi \quad B = \{\phi\} \quad C = \{\{\phi\}\}$

4. $A = \phi \quad B = \{\phi\} \quad C = \{\phi, \{\phi\}\}$

7.

(1) $\{\phi, a, \{a\}, \{a, \{a\}\}\}$

(2) $\{\phi, \{1, \{2\}\}\}$

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

(4) $\{\langle a, a\rangle, \langle b, a\rangle, \langle c, a\rangle, \langle a, b\rangle, \langle b, b\rangle, \langle c, b\rangle\}$

(5) $= \{\phi, \{\phi\}\} \times \{\phi, \{\phi\}\}$

$= \{\langle \phi, \phi\rangle, \langle \{\phi\}, \phi\rangle, \langle \phi, \{\phi\}\rangle, \langle \{\phi\}, \{\phi\}\rangle\}$

8. $P(\phi) = \{\phi\} \quad P(\{\phi\}) = \{\phi, \{\phi\}\}$

$B = \{\phi, \{\phi\}, \{\{\phi\}\}, \{\phi, \{\phi\}\}\}$

(1) $\phi \in B, \quad \phi \subseteq B$

(2) $\{\phi\} \in B, \quad \{\phi\} \subseteq B$

(3) $\{\{\phi\}\} \in B, \quad \{\{\phi\}\} \subseteq B$

11.

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

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

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

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

12.

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

$= \{1\} \cup \{1, 3, 5\}$

$= \{1, 3, 5\}$

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

$= \{\phi, \{1\}, \{4\}, \{1, 4\}\} - \{\phi, \{1\}, \{2\}, \{5\}, \{1, 2\}, \{1, 5\}, \{2, 5\}, \{1, 2, 3\}\}$

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

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.

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

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

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

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