Universidad del Valle

Taller Conjuntos

Matemáticas Discretas I / 750004C / Grupo 01 / Prof. Juan Francisco Díaz / Monitor Carlos Andrés Borja / 2021-II

1. Dados $A = \{a, b, \{c, d\}\}$, $B = \{b, \{d, c\}, \{a\}\}$, $C = \{a, b, c, c, \{c\}, \{c, c\}\}$ y $D = \{\emptyset, \{\emptyset\}\}$. Calcule:

   (a) $P(A)$

   (b) $A \setminus B$

   (c) $B \setminus A$

   (d) $|C|$

   (e) $P(D)$

2. Dados $A = \{a, b, c\}$, $B = \{c, d, e\}$, $C = \{a, e, g, h\}$ responda falso (F) o verdadero (V) según corresponda:

(a) $P(A) = \{\{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, \{a, b, c\}\}$ ( )

(b) $A \times B = \{(a, c), (a, d), (a, e), (a, a), (b, c), (b, d), (b, e), (c, c), (c, d), (c, e)\}$ ( )

(c) $\{a\} \in A$ ( )

(d) $|B \times C| = 8$ ( )

(e) $|P(C)| = 16$ ( )

(f) $C \setminus B = \{a, g, h, c\}$ ( )

(g) $B \setminus A = \{d, e\}$ ( )

(h) $\{\emptyset\} \in \{\emptyset, \{\emptyset, \emptyset\}\}$ ( )

3. Dados $A = \{\{a\}, \{b, c\}, d\}$, $B = \{\{a, a, a\}, b, \{c, b\}, \{d\}\}$, y $C = \{\emptyset, \{\emptyset\}, \{\emptyset, \{\emptyset\}\}, \emptyset, \{\emptyset, \emptyset, \emptyset\}\}$. Calcule:

(a) $B \setminus A$

(b) $A \setminus B$

(c) $P(A \cap B)$

(d) $|C|$

(e) $C \setminus \{\emptyset, \emptyset, \{\emptyset, \emptyset, \{\emptyset, \emptyset\}\}\}$

4. Determine verdadero (V) o falso (F) según corresponda.

(a) $x \in \{x\}$ ( )

(b) $\{x\} \subseteq \{x\}$ ( )

(c) $\{x\} \in \{x\}$ ( )

(d) $\{x\} \in \{\{x\}\}$ ( )

(e) $\emptyset \subseteq \{x\}$ ( )

(f) $\emptyset \in \{x\}$ ( )

(g) $\{\{\emptyset\}\} \subset \{\{\emptyset\}, \{\emptyset\}\}$ ( )

(h) $\{\emptyset\} \subset \{\emptyset, \{\emptyset\}\}$ ( )

(i) $\{\{\emptyset\}\} \subset \{\emptyset, \{\emptyset\}\}$ ( )

5. Pruebe, usando los teoremas y axiomas vistos en el curso, las siguientes demostraciones sobre conjuntos:

(a) $\overline{\overline{A} \cap (B \setminus A)} = A \cup \overline{(B \setminus C)}$

(b) $\overline{A \cap (B \setminus A)} = U$

(c) $A \cup \overline{(A \cup (B \setminus A))} = A \cup \overline{B}$

(d) $\overline{B} \cap \overline{(\overline{A} \cap \overline{(B \setminus A)})} = A \cap \overline{B}$

(e) $(A \cup B) \setminus C = (A \setminus C) \cup (B \setminus C)$

(f) $[(A \cup B) \cap (A \cup C)] \setminus (\overline{A} \cap B) = A$