

Homework 2
LING 255
Due: February 5, 2008

Assume that $U = \{1, 2, 3, 4, a, b, c, d\}$. Given:

$$\begin{array}{ll} A = \{1, 2, 3, 4\} & B = \{a, b, c, d\} \\ C = \{1, 2, c\} & D = \{1, 3, 4, a, b\} \\ E = \{1, c, d\} & F = \{ \{1, 2\}, 3, \{4, a\} \} \end{array}$$

Give, in list notation, the sets represented by:

- (1)
- a. $C \cap D$
 - b. $C \cup D$
 - c. $C' \cap D'$
 - d. $C' \cup D'$
 - e. $F \cup A$
 - f. $E \cap U$
 - g. $E \cup \emptyset$
 - h. $(A \cap D) \cup (B \cap E)$
 - i. $(C \cup E) \cup F$
 - j. $C \cup (E \cup F)$
 - k. $(C \cup E) \cap A$
 - l. $C \cup (E \cap A)$
 - m. $\wp(E)$

Characterize the following as true or false:

- (2)
- a. $A = \{4, 4, 3, 3, 1, 2, 1\}$
 - b. $A = \{\{4, 4\}, \{3, 3\}, 1, 2, 1\}$
 - c. $1 \in A$
 - d. $1 \subseteq A$
 - e. $\{1, 2\} \in A$
 - f. $\{1, 2\} \subseteq A$
 - g. $\{1, 2\} \in \wp(A)$
 - h. $\{1, 2\} \subseteq \wp(A)$
 - i. $\emptyset \in A$
 - j. $\emptyset \subseteq A$
 - k. $\emptyset \in \wp(A)$
 - l. $\emptyset \subseteq \wp(A)$

(3) Give the cardinality of: A, B, C, D, E, F, U, $\wp(U)$

(4) Write down the characteristic function of A, (a) in words and (b) in list notation