

**LING 553: Homework 1**  
Assigned: Friday, Sept. 12, 2008  
Due: Wednesday, Sept 17, 2008

**1. SET RELATIONS**

Using the following sets, classify statements (a)-(u) as true or false.

$$E = \{1, \{2\}, 2\} \quad F = \{1, 3, 4, \{1, 2\}\} \quad G = \{4, 1, \{\emptyset\}\} \quad H = \{1, \emptyset\}$$

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|------------------------|----------------------------|--------------------------------|
| a. $1 \in E$           | h. $\{1, 2\} \in F$        | o. $\{\emptyset\} \in G$       |
| b. $2 \in E$           | i. $\{1, 2\} \subseteq F$  | p. $\emptyset \subseteq G$     |
| c. $2 \subseteq E$     | j. $\{1, 4\} \subseteq G$  | q. $\{\emptyset\} \subseteq G$ |
| d. $\{1\} \in E$       | k. $\{1, 4\} \subseteq H$  | r. $\emptyset \in H$           |
| e. $\{1\} \subseteq E$ | l. $\emptyset \in E$       | s. $\{\emptyset\} \in H$       |
| f. $\{2\} \in E$       | m. $\emptyset \subseteq E$ | t. $\emptyset \subseteq H$     |
| g. $\{2\} \subseteq E$ | n. $\emptyset \in G$       | u. $\{\emptyset\} \subseteq H$ |

**2. SET OPERATIONS**

Using the following sets, and taking the universe to be  $I \cup J \cup K \cup L$ , specify—in list notation—the sets in (a)-(j).

$$I = \{a, b, c, d\} \quad J = \{a, b, c, d, e, f, g\} \quad K = \{a, \{a, b\}\} \quad L = \{b, \{g\}, \{a, b\}\}$$

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|---------------|----------------|-----------------|
| a. $U$        | e. $J - I$     | i. $L \cup J$   |
| b. $I \cup J$ | f. $J \cap K$  | j. $L' \cup K'$ |
| c. $I \cap J$ | g. $K - J$     | k. $\wp(K)$     |
| d. $I - J$    | h. $K \cup J'$ |                 |