24.903
Language & Structure III: Semantics and Pragmatics
Spring 2003, 2-151, MW 1-2.30
February 18, 2003
Assignment 2, due in class on February 26

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1. Determine whether each of the following is true or false (and say why).
(a) $\phi \subseteq \phi$
(b) $\phi \in \phi$
(c) $\phi \in \{\phi\}$
(d) $\phi \subseteq \{\phi\}$
(e) $\{a, b\} \in \{a, b, c, \{a, b\}\}$
(f) $\{a, b\} \subseteq \{a, b, \{a, b\}\}$
(g) $\{a, b\} \subseteq 2^{\{a,b,\{a,b\}\}}$
(h) $\{\{a, b\}\} \subseteq 2^{\{a,b,\{a,b\}\}}$
(i) $\{a, b, \{a, b\}\} - \{a, b\} = \{a, b\}$

2. The set-theoretic laws concerning $\cup$ and $\cap$ seem to be related to the laws of arithmetics concerning $+$ (addition) and $*$ (multiplication). For example, $+$ is commutative, as we have $a + b = b + a$. Compare the set-theoretic laws with the basis arithmetic laws and note similarities and differences. (Do this with commutativity, associativity, distributivity and idempotency).

3. Which of the following statements are true (and why)?
(a) $\{x : x = a\} = \{a\}$
(b) $\{x : x \text{ is green}\} = \{y : y \text{ is green}\}$
(c) $\{x : x \in A\} = A$
(d) $\{x : x \in \{y : y \in B\}\} = B$
(e) $\{x : \{y : y \text{ likes } x\} = \phi\} = \{x : \{x : x \text{ likes } x\} = \phi\}$

4. Give the characteristic functions of the sets $\{\ \}$, $\{1, 3\}$, $\{3, 4\}$ and $\{1, 2, 3, 4\}$, with respect to the universe {1,2,3,4}. Specify them as sets of pairs, or in a notation using arrows.

From Heim & Kratzer

1. Exercise on sentence connectives (pg. 23), and Exercise 2 on Currying (pg. 32). These exercises are closely related and should be answered as a unit.

2. Exercise on functions as sets (pg. 24)

3. Exercise 1 on Currying (pg. 31)