

CSE 321: Discrete Structures
Assignment #2
April 9, 2003
due: Wednesday, April 16

1. Section 1.3, exercise 10, parts b and d.
2. Section 1.3, exercise 12, parts c, d, e, h, i.
3. Let $Q(A, B)$ be the statement " $A \subseteq B$ ". If the universe of discourse for both A and B is all sets of integers, what are the truth values of the following? Justify your answers.
 - (a) $(\forall B)Q(\{1, 4\}, B)$
 - (b) $(\exists B)Q(\{1, 4\}, B)$
 - (c) $(\exists A)(\exists B)Q(A, B)$
 - (d) $(\forall A)(\exists B)Q(A, B)$
 - (e) $(\forall B)(\exists A)Q(A, B)$
 - (f) $(\exists A)(\forall B)Q(A, B)$
 - (g) $(\exists B)(\forall A)Q(A, B)$
 - (h) $(\forall A)(\forall B)Q(A, B)$
4. Which of the following statements are true? Justify your answers.
 - (a) $1 \in \{1, 2\}$
 - (b) $1 \subseteq \{1, 2\}$
 - (c) $\{1\} \in \{1, 2\}$
 - (d) $\{1\} \subseteq \{1, 2\}$
 - (e) $\phi \in \{1, 2\}$
 - (f) $\phi \subseteq \{1, 2\}$
 - (g) $\{\phi\} \subseteq \{1, 2\}$
5. Section 1.4, exercise 22, parts c and d.
6. Section 1.5, exercise 10, part e. Give a careful proof, using the format of proofs in lecture, with a justification for each line of your proof.
7. Carefully prove the following implication, using the format of proofs in lecture:

$$(A \cap B = A) \rightarrow (A \subseteq B).$$