Pre-Term "Test"

Look over these questions; if you think, "I've seen this stuff before, and it's trivial" there's no need to write out answers. If you think, "I've seen this stuff before, but I'm not certain I know the answers," then give them a try and send your answers to me. If you think, "I don't know this stuff at all," please let me know so I can adjust what I plan to do in the first weeks.

1. Write out a definition of set union: $x \in A \cup B$ iff ...

2. Write out a definition of set intersection: $x \in A \cap B$ iff ...

3. Write out a definition of subset: $A \subset B$ iff...

4. Write out a definition of power set: A is the powerset of B iff ...

5. Write out an informal definition of "f is a function from A to B."

6. Write out a formal definition of "f" is a function from A to B."

7. Given an informal example of a function that has nothing to do with numbers or sets.

8. Regiment the following argument in PL (indicate which sentence letters of PL translate which sentences of English):

   > Either George doesn't have a high cholesterol level or cholesterol is trapped in the walls of his arteries. If cholesterol is trapped in his arteries, then plaque will build up and block his arteries, and with such a buildup and blockage he is a candidate for a heart attack. Hence George is a candidate for a heart attack.

9. Use a truth-table to determine whether $-B \rightarrow [(B \vee D) \rightarrow D]$ is valid.

10. Write out a proof, in your favorite natural deduction system, of $-K$ from the premises

    - $(A \vee B) \vee (C\&D)$
    - $(A \leftrightarrow E)\&(B \rightarrow F)$
    - $K \leftrightarrow -(E \vee F)$
    - $C \rightarrow B$.