1.1.xa. Exercise answers

1. **a.** This holds; the premise must contain all the information provided by the conclusion since they are the same sentence.

   b. If φ contains all the information in ψ and ψ contains all the information in χ, then φ must contain all the information in χ; so this claim is true.

   c. This is not true in general. If φ entails ψ then φ contains all the information in ψ; but, if φ also contains further information not in ψ, it will not be entailed by ψ.

   d. This is true; if Γ ⇒ φ then all the information provided by the members of Γ together with φ is provided by the members of Γ alone, so whenever a sentence is entailed by Γ together with φ it will be entailed by Γ.

   e. This is not true in general. If each of φ and ψ is entailed by the other together with χ, we know that χ contains any information that is in one of φ and ψ but not the other; but it may also contain further information that is in neither, so it need not be entailed even by the two taken together.

2. **a.** Nothing definite can be concluded. The successful test tells you that some true information has been extracted from the hypothesis and auxiliary assumptions. But that can be so even if the hypothesis is not true since a body of information that is not true as a whole can still contain true information. For example, even if the prediction of the result of one test holds true, predictions about other tests may not.

   b. You can conclude that the hypothesis is false *provided that the auxiliary assumptions are all true*. The unsuccessful test tells you that a false prediction has been extracted from the hypothesis together with auxiliary assumptions about the test, but this can happen even if the information provided by the hypothesis itself is entirely accurate. The prediction may have failed, for example, because of incorrect assumptions about the way some apparatus would work.