CRITICAL THINKING
Final Review

Step I: Definitions of Logical Properties

   1) Propositions or Statements:
       a) Logical truth, falsity, and indeterminacy: Law of Excluded Middle; Non-contradiction.
       b) Vagueness and ambiguity.
       c) Definitions: real (extensional vs. intensional) vs. nominal (conventional vs. stipulative); rules for good definitions (equivalence, essential characteristics, clarity, and neutrality).
       d) Scope: Particular, universal, and general (for the most part) claims; counter-examples.

   2) Sets of Propositions or Statements: consistency and inconsistency; equivalence.

   3) Arguments: Inferential Strength (Deductive Validity & Inductive Strength), Soundness.
       a) Argument: consists of propositions (statements, declarative sentences) that are connected in such a way that some of them (the premises) are claimed to support or provide evidence for a proposition (the conclusion) that is typically different from the premises.
       b) Inferences vs. Explanations: causal explanations typically attempt to explain why something is case, where it is already clear that that something is the case; here we seek the variable condition or event that brought about the result, as opposed to the unvarying background conditions. All other things being equal (*ceteris paribus*), the cause is the event that produced the change or state of affairs to be explained.
       c) Deductive validity vs. soundness.
       d) Inductive strength: typically an inference from a sample to a whole class or population (universal inductive inference). Sufficiency of premises: How representative is the sample? How uniform, homogeneous, invariable is the class from which the sample is drawn?
       e) Fallacies: common mistakes with respect to either the truth of the premises or the strength of the inference.

Step II: Standardize the Propositions and Arguments

   a) Standardizing propositions (preparing them for evaluation): identify the claim being made and what kind of claim it is (e.g., definition of a term, empirical claim about the perceptible world), and then symbolize it using the same symbol to stand for the same claim.
   b) Standardizing Arguments: identify the parts of the argument, that is, the premises and conclusions, using premise and conclusion indicators; determine whether the argument is simple or complex (the latter is also known as an extended argument or sorites); consider

whether the argument is best understood as an enthymeme; determine whether the premises are dependent or independent; determine what kind of inference is being drawn, deductive, inductive, or analogical.

Step III: Testing for Logical Properties

Apply the syntactical or semantic tests we have learned to determine the logical properties of the propositions and arguments under consideration.

a) Categorical/Syllogistic Logic:
   i)   Immediate inference (square of opposition and relations of conversion, obversion and contraposition);
   ii)   Mediate Inference: Rules of valid syllogism (syntactical test) and Venn diagram (semantic test).

b) Propositional/ Statement Logic (SL):
   i)   Truth tables (semantic test);
   ii)   Derivations using derivation rules for SL (syntactical test).