

Philosophy 103: Introduction to Logic

Logic Exercise Answers: Deduction and Induction

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Directions: Study the following passages. First, explain whether the arguments in the following passages are deductive or inductive. Second, diagram the arguments using the numbered statements.

1. (1) Given the view that species evolve into one another, (2) then members of one species must somehow give rise to members of another species. (3) It follows that members of the second species must somehow derive as variants of members of the first. (Stuart A. Kauffman, *The Origins of Order: Self-Organization and Selection in Evolution* (Oxford: Oxford University Press, 1993), 6.)

Answer: Deductive argument: the conclusions follow from the meanings of the words used.



Figure 1:

2. (1) [B]uttermilk is partially fermented skimmed milk that has become viscous (2) because *Leuconostoc*, a filamentous relative of the lactobacillus, has grown in it. John Postgate, *Microbes and Man*, 3rd. ed., (Cambridge: Cambridge University Press, 1992) 131.)

Answer: Nonargument—explanation. The word “because” is being used in a causal sense; the passage *explains why* buttermilk is viscous.

3. (1) There is a common substance among the arts (2) because there are general conditions without which an experience is not possible. (Adopted from John Dewey, *Art as Experience* (New York: Minton, Balch, 1943), 212.)

Answer: Argument—deductive. The conclusion is claimed to follow with certainty since the common conditions of experience presuppose “something” be uniformly conditioned.



Figure 2: Argument—deductive

4. (1) Chick embryos inoculated with human fibrosarcoma cells derived from a type of bone cancer were dosed for nine days with an amount of alcohol corresponding to about two glasses of wine a day in people. (2) Those embryos developed an extensive network of blood vessels and doubled in size. (3) The cancer in the alcohol-dosed embryos secreted a protein called vascular endothelial growth factor. (4) These data suggest that alcohol is an important mechanism for cancer growth. (C. Brownlee, “Not to Your Health.” *Science News* 167.3 (2005): 37.)

Answer: The conclusion is claimed to follow with probability as indicated by the words “These data suggest.”

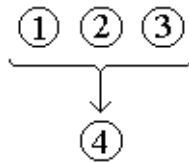


Figure 3: Argument—inductive

5. (1) When plants landscaped with crushed rock are watered, evaporation of soil moisture sometimes creates colorful crusts of salts on the surface of the ground. (2) The minerals in these crusts contain concentrations of zinc, molybdenum, and copper, and (3) the concentrations of these elements are sometimes deemed unsafe. (4) Consequently, undesirable trace elements are getting into the environment. (Adapted from Sid Perkins, “Landscaping stones may pose risks to the environment,” *Science News* 167.3 (2005): 35.) **Answer:** The conclusion follows with probability since the premises do not imply the concentrations are *known* to be unsafe—the concentrations of the elements are sometimes “said” to be unsafe.

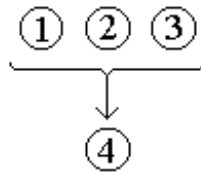


Figure 4: Argument—inductive

6. (1) In investigating hereditary characteristics, we find that vast amounts of literature in the last few years point toward two types of fiber in human muscle tissue: Type 1, slow twitch, or red; and Type 2, fast twitch or white muscle fiber. (2) It is believed that the number of white and red muscle fibers is genetically predetermined and remains unchanged during a lifetime. (3) Consequently, in accordance with the distribution that prevails, some people appear to be quicker than others. (Teruyuki Okazaki and Milorad V. Stricevic, *The Textbook of Modern Karate* (Tokyo: Kodansha, 1984), 19). **Answer:** The conclusion is not claimed to follow with certainty since the premisses are not clearly known and the hedge words “appear to be” indicates the conclusion does not necessarily follow.

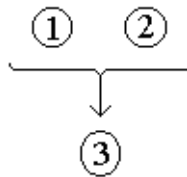


Figure 5: Argument—inductive

7. (1) All human beings have the ability to think rationally and realistically. (2) We all can realize, “Even if I am probably correct, there is still room for questioning.” (3) Thus we can allow discussion, disconfirmation, and new evidence to change our minds. (James O. Prochaska, *et al*, *Changing for Good* (New York: William Morrow, 1994), 182.)

Answer: From the fact that we all *can* realize that there is room for error, it follows with certainty (by the meanings of the words) that we *can* be open to correction.

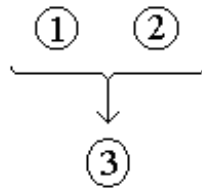


Figure 6: Argument—deductive

8. (1) Most psychohistorians reject non-psychoanalytic psychologies for use in historical research (2) because of their ahistorical non-developmental character and (3) because they are either so simplistic that they explain only elementary traits or so lacking in structural coherence as to be unusable by historians. (Peter Loewenberg, *Decoding the Past: The Psychohistorical Approach* (New York: Knopf, 1983) 19.)

Answer: The conclusion followw with a probability based on to what extent a rejection of non-psychoanalytic psychologies depends on oversimplification and ahistoricity.

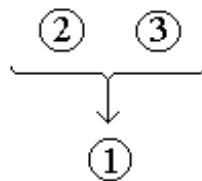


Figure 7: Argument—inductive

9. (1) It is not recorded what part either Themistocles or Aristides took in the debate of the council of war at Marathon. (2) But from the character of Themistocles, his boldness, and his intuitive genius for extemporizing the best measure in every emergency (a quality which the greatest of historians ascribe to him beyond all his contemporaries), (3) we may well believe that the vote of Themistocles was for prompt and decisive action. (Edward S. Creasy, *Fifteen Decisive Battles of the World* 1851 (New York: DaCapo Press, 1994) 8.)

Answer: The conclusion is a probabilistic inference based on a character trait and is not claimed to follow with certainty.

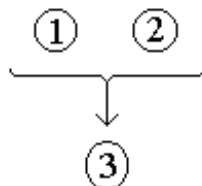


Figure 8: Argument—inductive

10. (1) There is no relation between ‘sincerity’ and value as art. (2) The volumes of agonizingly felt love poetry perpetrated by adolescents and the dreary (however fervently felt) religious verse which fills libraries, are sufficient proof of this. (René Wellek and Austin Warren, *Theory of Literature* (New York: Harcourt Brace, 1956) 80.)

Answer: From the fact that some sincere adolescent and religious poetry is not valuable, the conclusion that no relation between sincerity and value exists in art is not certain. Other factors in the relation could be significant.



Figure 9: Argument—inductive