PHILOSOPHY 101: Quiz #3/4 Solutions

April 19, 2011

1. All deductively sound arguments have true conclusions. **T**

   Proof. If an argument $\mathcal{A}$ is sound, then (*i*) $\mathcal{A}$ is valid, and (*ii*) all of $\mathcal{A}$'s premises are true (definition of deductive soundness). It then follows from the definition of validity, together with (*ii*), that $\mathcal{A}$'s conclusion must be true. ❑

2. No ill-formed arguments have true conclusions. **F**

   Counterexample. Here's an ill-formed argument with a true conclusion:

   1. The sky is blue.
   ∴ **2**. This quiz has 22 questions. ❑

3. All valid arguments with false conclusions have at least one false premise. **T**

   Proof. Let $\mathcal{A}$ be a valid argument with a false conclusion. As we know, if all of $\mathcal{A}$'s premises *were* true, then its conclusion would also have to be true. But, since $\mathcal{A}$'s conclusion is *false* (by assumption), it *can't* be the case that all of its premises are true. Hence, $\mathcal{A}$ must have at least one false premise. ❑

4. All well-formed arguments have true premises. **F**

   Counterexample. Here's a well-formed argument with *all* false premises:

   1. All living things are men.
   2. This quiz is a living thing.
   ∴ **3**. This quiz is a man. ❑

5. Only cogent arguments can be defeated. **T**

   Proof. This is an obvious consequence of the definition of "defeat," (see **D5.4**, on page 114). ❑

6. It is possible for an argument to be cogent, have all true premises, be defeated, and have a true conclusion. **T**

   Proof. Consider the following argument, $\mathcal{A}$:

   1. John bought at least one lottery ticket.
   2. Most people who buy at least one lottery ticket don't win the lottery.
   ∴ **3**. John won't win the lottery.

   Clearly, $\mathcal{A}$ is cogent. Now, assume that our total evidence E_T supports both premises (1) and (2), and that (1) and (2) really are true. Assume further that our total evidence E_T includes the information that John bought *every possible lottery ticket — except one*. Thus, our total evidence supports both premises (1) and (2), but *goes against* the conclusion, (3). Therefore, our total evidence E_T *defeats* $\mathcal{A}$. Finally, assume that the winning ticket just happens to be the only one that John did *not* buy. As a result, the (unlikely) conclusion of $\mathcal{A}$ turns out to be true after all! ❑

7. Every argument that you evaluate is either deductively strong for you, inductively strong for you, or weak for you. **T**

   Proof. If an argument is neither deductively strong for you nor inductively strong for you, then it is both deductively weak for you and inductively weak for you. We call such arguments (just plain) *weak* for you. Therefore, the three categories *deductively strong for you*, *inductively strong for you*, and *weak for you exhaust all the logical possibilities*. ❑

8. If an argument is inductively strong for you, then it must be *ir*rational for you to disbelieve its conclusion. **T**

   Proof. If $\mathcal{A}$ is inductively strong for you, then your total evidence E_T must *support* the conclusion of $\mathcal{A}$. Therefore, it would be rational for you to believe $\mathcal{A}$'s conclusion, and, as a result, *ir*rational to *dis*believe it. ❑

9. If an argument is inductively weak for you, then it must be rational for you to disbelieve its conclusion. **F**

   Counterexample. Here's an inductively weak (∵ *not* cogent) argument with a reasonable conclusion (for most people):

   1. The sky is blue.
   ∴ **2**. The earth is not flat. ❑

10. If an argument is defeated by your total evidence, then it must be *ir*rational for you to believe its conclusion. **T**

Proof. If $\mathcal{A}$ is defeated by your total evidence E_T, then E_T must *go against* the conclusion of $\mathcal{A}$ (this follows from the definition of "defeat"). Therefore, it would be *ir*rational for you to believe the conclusion of $\mathcal{A}$. ❑

11. If an argument is defeated by your total evidence, then it must be rational for you to believe all of its premises. **T**

Proof. If $\mathcal{A}$ is defeated by your total evidence E_T, then E_T must support all the premises of $\mathcal{A}$ (this follows from the definition of "defeat"). Therefore, it would be rational for you to believe all of $\mathcal{A}$'s premises. ❑

12. If an argument is deductively strong for you, then it must be rational for you to believe its conclusion. **T**

Proof. If $\mathcal{A}$ is deductively strong for you, then (*i*) $\mathcal{A}$ is valid, and (*ii*) your total evidence E_T must support all the premises of $\mathcal{A}$. Furthermore, if E_T supports X, and X logically entails Y, then E_T must also support Y.[1] Therefore, E_T must support the conclusion of $\mathcal{A}$, and, as a result, it must be rational for you to believe the conclusion of $\mathcal{A}$. ❑

13. If an argument is deductively weak for you, then it must be rational for you to disbelieve its conclusion. **F**

Counterexample. See # 9, above, for a deductively weak argument with a reasonable conclusion (for most people). ❑

14. Some valid arguments are cogent arguments. **F** (*why?*)

15. No deductively unsound arguments are inductively strong (for any person). **F** (*why?*)

Counterexample. Here's a plausible counterexample (*why?*):

1. Most people do not live to be 120.
2. Branden is a person.
$\therefore$ **3**. Branden will not live to be 120. ❑

16. One argument can be more cogent than another (*i.e.*, cogency comes in degrees). **T**

Proof. Let $\mathcal{A}$ and $\mathcal{A}'$ be any two distinct cogent arguments with conclusions $C_{\mathcal{A}}$ and $C_{\mathcal{A}'}$, respectively. If the premises of $\mathcal{A}$ make $C_{\mathcal{A}}$ *more probable* than the premises of $\mathcal{A}'$ make $C_{\mathcal{A}'}$, then $\mathcal{A}$ is *more cogent* than $\mathcal{A}'$. ❑

17. One argument can be more valid than another (*i.e.*, validity comes in degrees). **F** (*why?*)

18. One argument can be weaker (for some person) than another (*i.e.*, strength comes in degrees). **T**

Proof. This follows from the fact that strength is a function of cogency (which, as we saw in # 16, comes in degrees). But, there is also another reason why strength comes in degrees. This is because strength is also a function of *how well* one's total evidence supports the premises of an argument, and, as we know, support comes in degrees. ❑

19. The following argument is cogent:

1. Branden just purchased a lottery ticket.
$\therefore$ **2**. Branden will not win the lottery.

F

20. The following argument, $\mathcal{A}$, is deductively sound:

1. All valid arguments are well-formed arguments.
2. $\mathcal{A}$ is valid.
$\therefore$ **3**. $\mathcal{A}$ is well-formed.

T

Proof. $\mathcal{A}$ fits the well-known valid argument pattern:

1. All X's are Y's.
2. $\mathcal{A}$ is an X.
$\therefore$ **3**. $\mathcal{A}$ is a Y.

Therefore, $\mathcal{A}$ is valid. But, since that is just what $\mathcal{A}$'s second premise, (2), says, it follows that (2) is true! Moreover, $\mathcal{A}$'s first premise, (1), is true, by the definition of "well-formed." Hence, because $\mathcal{A}$ is valid, and both of its premises are true, $\mathcal{A}$ is deductively sound. ❑

21. If an argument is neither deductively sound nor inductively sound, then it must *either* have at least one false premise *or* be ill-formed. **T** (*why?*)

22. If you rationally believe that an argument $\mathcal{A}$ is inductively sound, then $\mathcal{A}$ must be inductively strong for you. **F**

Proof. If you *rationally* believe that an argument $\mathcal{A}$ is inductively sound, then your total evidence E_T must support *both* (*i*) that all the premises of $\mathcal{A}$ are true, *and* (*ii*) that $\mathcal{A}$ is cogent. But, it does *not* follow that E_T must support the conclusion of $\mathcal{A}$. It could turn out that E_T *defeats* $\mathcal{A}$, in which case $\mathcal{A}$ would *not* be inductively strong for you. ❑

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[1] Because, *if X logically entails Y, then the probability of Y must be at least as great as the probability of X.* This is a basic fact about probability. Can you explain why this basic fact about probability is true? Try to think of concrete examples.