

# Philosophy 101 — Homework #4 solutions

03/29/11

## (1) p. 72 #2

The argument in question is:

1. If you like logic, then you love debate.
  2. You like logic.
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3. You love debate.

Let  $P$  = “you like logic”, and  $Q$  = “you love debate”. Then, the argument is of the form

1. If  $P$ , then  $Q$ .
  2.  $P$ .
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3.  $Q$ .

which is *modus ponens*.

## (2) p. 72 #4

The argument in question is:

1. If you like logic, then you love debate.
  2. It's not the case that you love debate.
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3. It's not the case that you like logic.

Let  $P$  = “you like logic”, and  $Q$  = “you love debate”. Then, the argument is of the form

1. If  $P$ , then  $Q$ .
  2. not- $Q$ .
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3. not- $P$ .

which is *modus tollens* (or *denying the consequent*).

## (3) p. 83 #2

Cogency comes in degrees because cogency involves *how probable* the conclusion of an argument is, given its premises. Validity, on the other hand, is defined as “yes/no” concept. Validity is a matter of the *impossibility* of the premises (all) being true while the conclusion is false. And, it is either

impossible for the premises of an argument to be true while its conclusion is false, or it is not. There are no “degrees of logical impossibility”.

#### (4) p. 92-93 #1

(1a) Suppose you know that an argument is ill-formed. What can you conclude about the truth value of its conclusion? Well, we can't say anything *unconditionally* about the truth-value of its conclusion. All we can say is: *it is **not** the case that: if its premises are (all) true, then its conclusion is probably true.* That is, *even if its premises are all true, its conclusion may still be improbable.*

(1b) Suppose you know that an argument is valid. What can you conclude about the truth value of its conclusion? Again, we can't say anything *unconditionally* about the truth-value of its conclusion. All we can say is that *if its premises are (all) true, then its conclusion **must** be true.*

(1c) Suppose you know that an argument is valid and that its conclusion is false and that one of its two premises is true. What can you conclude about the truth value of its other premise? In class, we *proved* that the other premise of such an argument *must be false*. Here was the *argument* I gave:

1. All valid arguments with *all* true premises have true conclusions. [*definition*]
2. Argument *a* has a false conclusion. [*given*]
3. [Therefore,] argument *a* is *not* a valid argument with *all* true premises. [1, 2, *logic*]
4. [Therefore,] *if* argument *a* is valid, it must *not* have *all* true premises. [3, *logic*]
5. Argument *a* is valid. [*given*]
6. [Therefore,] argument *a* must *not* have *all* true premises. [3, 5, *logic*]
7. The first of argument *a*'s two premises is true. [*given*]
8. Therefore, argument *a*'s second premise *must be false*. [6, 7, *logic*]

(1d) Suppose you know that an argument is cogent and that its conclusion is true. What can you conclude about the truth value of its premises? Nothing at all. Cogency only constrains the probability of the *conclusion, given the premises*. It says *nothing* about the probability of the ***premises, given its conclusion***.

(1e) Suppose you know that an argument is valid and that it has true premises. What can you conclude about the truth value of its conclusion? You can conclude (by applying the definition of validity) that the conclusion of the argument *must be true*.

#### (5) p. 93 #3d

The argument is:

1. Most days are odd-numbered.
2. There was a day on which the U.S. population reached 200 million.

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3. The day on which the U.S. population reached 200 million was odd-numbered.

This argument is *cogent*. [In fact, it's a *strong*, *unless* we have some specific reason to believe that the population reached 200 million on an even-numbered day — *a defeater* of the conclusion.]

**(6) p, 93 #3e**

The argument is:

1. Most days are odd-numbered.
  2. There will be a day on which the U.S. population reaches 300 million.
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3. The day on which the U.S. population reaches 300 million will be odd-numbered.

This argument is *cogent* too (and also probably strong as well).