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http://www.fbcweb.org/doctrines.html

LOGIC – Lesson 13: Modus Ponens and Modus Tollens

In this lesson we will be looking at modus ponens and modus tollens. These are names given to hypothetical syllogisms: "If something (=P), then (>) something else (=Q)." The only valid modus ponens is the one that affirms the antecedent (P); it is invalid to affirm the consequent (Q) in an effort to affirm the antecedent (P). The only valid modus tollens is the one which denies the consequent (Q); it is an invalid modus tollens to deny the antecedent (P) in an attempt to get to the consequent (Q).

Examples:

1. Modus Ponens

P = I am deceived
Q = I don't know that I am deceived

If P > Q
P

_____
Therefore Q = affirming the antecedent (P) to get to (Q) = valid Modus Ponens = If someone really is deceived (P), then he would not know he is deceived (Q).

However, note the invalid "Modus Ponens"

1. If P then Q

Q

_____

Therefore P = This is invalid = P is unknown. You cannot affirm Q to get to P.

This is called affirming the consequent (Q), and it is invalid. The point here is that if it is the case that a person is in a state of not knowing if they are deceived, you cannot affirm that they are deceived. Maybe they are deceived, but maybe not; maybe they are confused or not grounded in epistemology. A person could be in a state of confusion (not knowing if deceived) when shaken in their faith by an unbelieving professor in college. They could be confused and not know if they have been deceived about Jesus Christ's love (Q), but you cannot affirm the antecedent (P) that they really are deceived about Jesus Christ's love by affirming Q.

There is more I need to say about this, but for now: as far as the strict logic of modus ponens, you cannot know the antecedent (P) by affirming the consequent (Q). You cannot say that they are in a state of P because of their state in Q.

With valid Modus Ponens, for example: If P = if it rains > Q = my grass is wet; I can affirm P to know Q, but I cannot affirm Q (wet grass) to get to P (rain), maybe the sprinkler got the grass wet or my wacky neighbor watered my lawn at three o'clock in the morning.

This deals with necessary logic. Philosophically speaking, the only way someone could be sure that he is not deceived is for him to know Truth and this includes knowing why he believes what he believes, and why it cannot be otherwise. Then and only then can he be absolutely sure. By the way, this cannot be done in a naturalistic context. It can be done through philosophical realism, and yes through the personal convicting ministry of the Holy Spirit, although the latter evidence is restricted to the personal spiritual life, which is very important and can be put in logical propositions as well, just not any that would be acceptable in the public square.

1. Let's try modus tollens where the consequent it denied

P (if I am deceived)> Q (then I do not know it)

-Q (I know that I am not deceived = it is not true that I do not know I am deceived)

____

-P = Valid = "If I am deceived (P) then I do not know that I am deceived (Q). However, if it is not true that I do not know that I am deceived = I do know that I am not deceived (-Q), then it logically follows that I am not deceived (-P)." The bottom line here is that one could know they are not deceived (-Q) and therefore not be deceived (-P).

2. Another example. In 2 Thessalonians 2:10 we are told that certain people will be deceived because they do not receive a love for the truth.

P= If man does not have a love for truth

Q = he will be deceived.

P>Q

P

___

Q = Valid (affirming P gets you to Q). "The man who does not have a love for truth (P), will be deceived (Q)." The man does not have love for truth, therefore he is deceived.

2. P (man does not have love for truth)>Q (he will be deceived)

Q (he will be deceived)

___

P = invalid. One cannot affirm Q to get to P in modus ponens. One cannot say that because he is deceived that it is because he did not receive a love for the truth. Perhaps the person never heard the truth, maybe he is under the age of accountability and therefore has not *yet* been exposed to the truth. Maybe he is positive and God is sending the truth but it is not there yet. Perhaps they were born with severe mental disabilities and do not have the ability to understand truth. While it might be tempting to affirm P by affirming Q, it is logically invalid. It does not follow!

2. P>Q

-Q

____

-P = valid. "If someone does not receive a love for the truth (P), then he is deceived (Q). The person is not deceived (-Q), therefore they love truth (- P, = it is NOT the case that they do not love truth).

3. John 8:32 – "You shall know the truth and the truth shall set you free."

P = Know truth

Q = free

P>Q

P

___

Q = valid modus ponens. "If you know the truth (P), then you will be free (Q). You know the truth (P), therefore you are free (Q)."

3. P>Q

-Q

___

- P = valid modus tollens. "If you know the truth, then you will be free. You are not free (-Q), therefore you do not know the truth (-P)."

3. P>Q

Q

_____

P = invalid modus ponens: one cannot affirm the consequent Q to get to P. "If you know the truth, then you will be free. I am free, therefore I know the truth." While this may sound right, and perhaps is right, logically it is invalid.
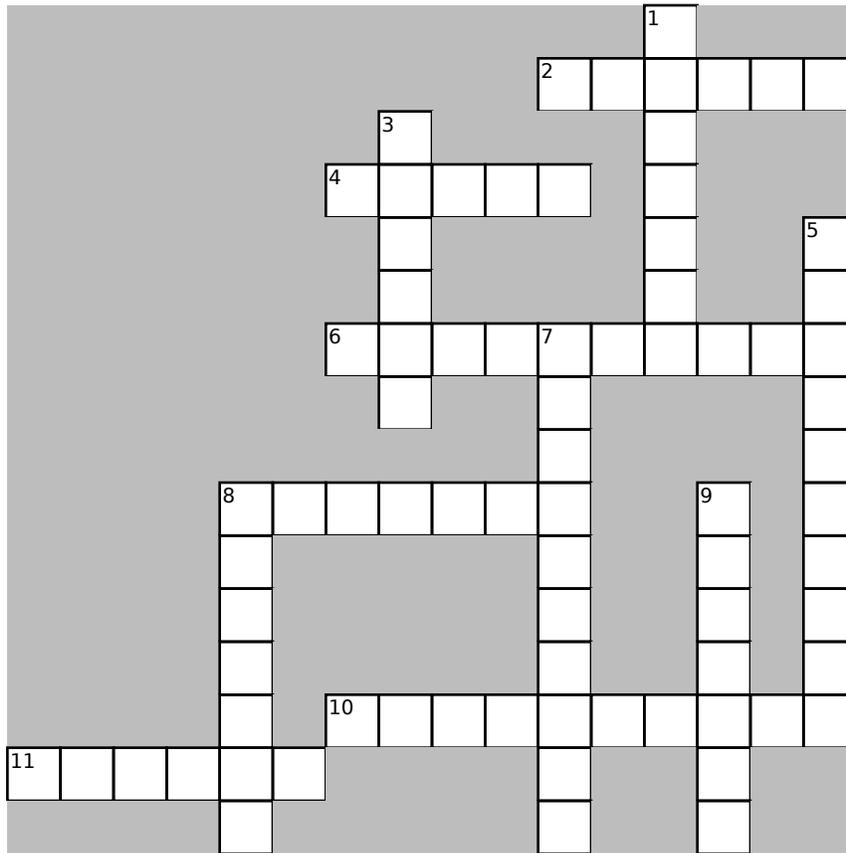
3. P>Q

-P

___

-Q = invalid modus tollens: one cannot deny the antecedent. "If you know the truth, then you will be free. I do not know the truth, therefore I am not free." Again, this sounds true and perhaps it is, but it is not logically valid. Like my earlier illustration: my grass being wet is probably due to the rain. However, this is not a logical necessity.

Logic has very precise rules. Logic is not just what sounds logical. It is very easy to make errors in logic. It is even easy to make errors working out these precise syllogisms in written form. If it is easy to make errors when one writes down syllogisms, think of how easy it is for man to make errors on the fly, especially when he does not even understand what is valid or invalid as he forms "his logical" viewpoints constantly about everything in life.
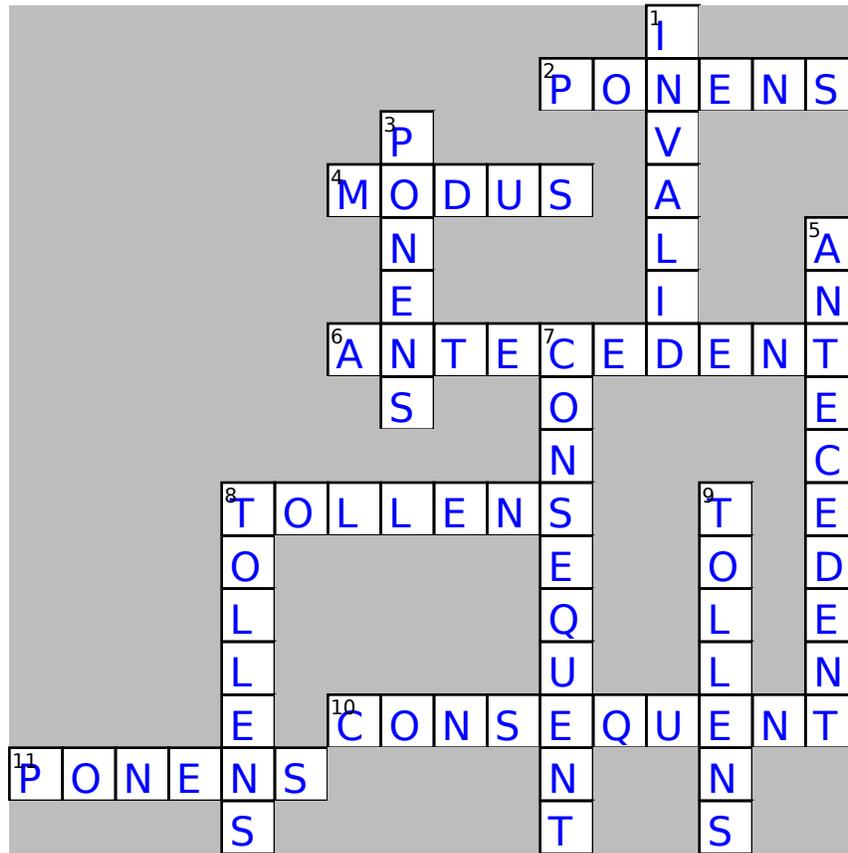

In the Logos,

Pastor Don

Logic Lesson 13

Across

2 "If you believe, you will be saved. You believed, therefore you are saved" is a modus ____.

4 If P>Q, -P, therefore -Q is an invalid ___ tollens.

6 It is invalid to deny the ____ .

8 If P>Q, -Q, therefore -P is a modus ___ .

10 It is invalid to affirm the ____ .

11 "If I confess my sins, God will forgive me. God forgave me. Therefore, I confessed my sins" is an invalid modus ___.

Down

1 If P>Q, Q, therefore P is an ____ modus ponens.

3 If P>Q, P, therefore Q is a modus ____.

5 In a valid modus ponens, one affirms the ____ .

7 In a valid modus tollens, one denies the ____ .

8 "If I confess my sins, God will forgive me. I did not confess my sins. Therefore God will not forgive me" is an invalid modus ____.

9 "If you believe, you will be saved. You did not believe. Therefore you are not saved" is an invalid modus ___

Logic Lesson 13

Crossword grid answers:

- 2 Across: PONENS
- 4 Across: MODUS
- 6 Across: ANTECEDENT
- 8 Across: TOLLENS
- 10 Across: CONSEQUENT
- 11 Across: PONENS
- 1 Down: INVALID
- 3 Down: PONENS
- 5 Down: ANTECEDENT
- 7 Down: CONSEQUENT
- 8 Down: TOLLENS
- 9 Down: TOLLENS

Across

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