

# Lesson 48 – Validity of Simple Arguments

## (A) Introduction

<http://video.google.com/videoplay?docid=-572077907195969915#>

## (B) Definition/Clarification of Terms

**Validity:** A valid deductive argument is an argument in which the premises support the conclusion in such a way that, if the premises are assumed to be true, the conclusion must be true. In a valid deductive argument, if the premises are true it is logically impossible for the conclusion to be false.

**Validity:** A deductive argument is valid if it has a form that would make it impossible for the premises to be true and the conclusion false. If a deductive argument is valid, then its premises' being true would guarantee that its conclusion is true.

Proving Validity: To determine if a deductive argument is successful, you must first determine if it is valid or invalid. To determine if an argument is valid, you must identify the pattern of the argument and check to see whether the pattern is valid or invalid.

Note that validity is a matter of the **form or structure of an argument**, as opposed to the content. If an argument is valid, then any other argument with the same logical structure will also be valid, regardless of its content. Also, keep in mind that an argument can be valid even if its premises are not actually true.

## (C) Examples to Clarify VALIDITY

### Example One

1. If it is raining outside, then everything is going to get wet.
2. It is raining outside.

Therefore,

3. Everything is going to get wet.

In the first argument, the first premise asserts a connection between two things, such that if the first is the case, then the second will follow. The second premise asserts that the first is indeed the case, and when we put these two premises together, we logically led to infer the conclusion. **This argument is valid by virtue of its propositional form**

1. If A then B.
2. A.

Therefore,

3. B

### Example Two

1. All cats are mammals.
2. All mammals are animals that give birth to live young.

Therefore,

3. All cats are animals that give birth to live young.

In the second argument we are dealing with the relationship of three categories: cats, mammals, and animals that give birth to live young. The relationship asserted of the categories in the premises permits us to logically infer the conclusion. **The argument is valid by virtue of the categorical relations asserted in the premises.**

1. All As are Bs.
2. All Bs are Cs.

Therefore,

3. All As are Cs.

## Lesson 48 – Validity of Simple Arguments

### (D) Representations Used in Determining Validity

- a. **Imagine** .... To test whether or not an argument is valid, you should first imagine that the premises are true—whether or not they actually are—and then ask yourself, without appealing to any other knowledge you have, could you still imagine the conclusion being false? If you can, the argument is invalid. If you can't, then the argument is valid.
- b. **Venn Diagrams** ... Sometimes Venn diagrams can prove helpful. Consider these arguments

#### Categorical premises:

1. All dogs are cats
2. All cats are lizards
3. Therefore, all dogs are lizards

Clearly, this argument is not factually correct, for the premises are false. But it may be of a valid argument form.

So consider premise 1. We can represent what it is saying by drawing two circles. One circle represents a collection of all the dogs in the possible world, and the other circle represents all the cats. Since the premise says that ALL dogs are cats, we know that every member in the circle of cats must also be a member in the circle of dogs. **So we must put the dog circle INSIDE the cat circle.** Keep in mind that there are no premises telling you that all CATS are DOGS. Thus, there should be some leftover area of the cat circle that falls outside of the dog circle, to show that there may be some cats that are not dogs.

Now, look at the second premise. If all cats are lizards, **then the whole CAT circle (with the DOG circle still inside it) must be placed within the circle of all the lizards in the world.** At this point, we should have an accurate representation of the premises. Do they guarantee the conclusion? That is to ask: is it possible in that world for the conclusion to be false? Since you will notice that there is no area of the dog circle outside the lizard circle, you should see that if these premises were true, the conclusion must also be true. The argument is therefore valid.

#### "if...then" premises:

1. If Jane has a cat, then Jane has a pet
2. Jane has a cat
3. Therefore, Jane has a pet

Suppose we have a premise that says "if P then Q" (i.e. If Jane has a cat, then Jane has a pet).

We can think of this as stating that whenever P is true (Jane has a cat), then Q must also be true (Jane has a pet).

Another way of putting it is by saying: All cases of P (Jane does have a cat) are also cases of Q (Jane having a pet). If you find the Venn diagrams helpful, you could represent this by drawing a large Q-circle (having pet) with a smaller P-circle (having cat) inside of it.

Notice that this leaves with some area of the Q-circle (pet) that is not also in the P-area (cat). That is because "if P then Q" does not mean that there cannot be instances where Q is true (pet), but P is false (cat).

An important thing to notice, however, is that if you say that Q is false, then you must also say that P is false. Perhaps you could represent a statement (such as 'P' or 'Q') as being false by crossing out the area of its circle. So, for example, if another premise says that Q is false (or simply not-Q) then you could draw an X through the whole Q circle. Of course, this means also drawing an X through the P circle as well, so P must be false too.

## Lesson 48 – Validity of Simple Arguments

---

c. **Truth Tables** ..... Use a truth table to test the validity of the following argument.

- 1.If you invest in the MrS. Corporation, then you get rich.
- 2.You didn't invest in the MrS Corporation.
- 3.Therefore, you didn't get rich.

- A. Valid ?
- B. Invalid ?

### Step 1

Symbolize the argument.

Let p be the statement "You invest in the MrS. Corporation."

Let q be the statement "You get rich."

Then the argument has this symbolic form:

$$\begin{array}{l} p \rightarrow q \\ \sim p \\ \hline \therefore \sim q \end{array}$$

---

### Step 2

Make a truth table having a column for each premise and for the conclusion.

		premise	premise	conclusion
p	q	$p \rightarrow q$	$\sim p$	$\sim q$
T	T	T	F	F
T	F	F	F	T
F	T	T	T	F
F	F	T	T	T

---

### Step 3

Interpret the truth table.

Notice that in the third row, the conclusion is FALSE while both premises are TRUE.

This tells us that the argument is INVALID.

## Lesson 48 – Validity of Simple Arguments

---

### (E) Examples

- a. From: <http://www.math.fsu.edu/~wooland/argumentor/TruthTablesandArgs.html#example2>
- b. From: <http://people.umass.edu/klement/100/logic-worksheet.html>

### (F) Links & Resources:

- <http://www.math.fsu.edu/~wooland/argumentor/TruthTablesandArgs.html#example2>
- <http://people.umass.edu/klement/100/logic-worksheet.html>
- [http://faculty.ycp.edu/~dweiss/phl222\\_critical\\_thinking/deductive\\_arguments\\_and\\_validity.htm](http://faculty.ycp.edu/~dweiss/phl222_critical_thinking/deductive_arguments_and_validity.htm)
- [http://www.actdu.org.au/archives/actein\\_site/logarg.html](http://www.actdu.org.au/archives/actein_site/logarg.html)
- <http://www.unc.edu/~megw/Logic.html>
- <http://www.theskepticsguide.org/resources/logicalfallacies.aspx>
- <http://www.zweigmedia.com/RealWorld/logic/logic4.html>

video links:

<http://www.youtube.com/watch?v=vPRfNdLxSoQ>

<http://www.youtube.com/watch?v=02Wg4MX61DM&feature=related>