

# Basic Concepts

## Introduction to Logic

**Logic** - anatomy of thoughts.

**Argument** - series of statements called **premises** intended to determine the truth of another statement, that is named **conclusion**

Claim is some statement. Argument supports some claim and consists of premises and conclusions.

An argument is **LOGICALLY** valid if and only if it takes a form that makes it impossible for the conclusion to be false if premises are true.

*For example:* - **Valid argument:** If there is an earthquake, the detector will send a message. No message has been sent. So there is no earthquake. - **Invalid Argument:** Whenever Anil is here, Kumar is also here. Anil is not here, so Kumar is not here.

## Analyzing arguments

1. Identify the argument. (*is this an argument?*)
2. Reconstruct the argument (*what the premises and conclusions?*)
3. Evaluate the argument. (*simplify, point out what is good and what is bad*)

An *extended argument* is an argument that is made up of two or more other sub-arguments.

## Ambiguity

A sentence is ambiguous in a given context when there is more than one possible way of interpreting it in that context

- Lexical ambiguity. *He is looking for a match*
- Sentence ambiguity. *33-year old Mrs. Jones admitted to dangerous driving in Leeds Crown Court yesterday.*

**Vagueness** - lack of precision

**Irony**, in its broadest sense, is a rhetorical device, literary technique, or event in which what on the surface appears to be the case or to be expected differs radically from what is actually the case.

## Exercises

### Exercise I

*What is the conclusion in this argument?*

There can't be weapons of mass destruction in Iraq. If there were, then the military forces would have found them by now, or some radicalized group of insurgents would have used them. But the military forces haven't found them and no insurgent groups have used any.

**Answer:**

There can't be weapons of mass destruction in Iraq

**Why?** We can reconstruct the sentence to emphasize the conclusion:

If there were, then the military forces would have found them by now, or some radicalized group of insurgents would have used them. But the military forces haven't found them and no insurgent groups have used any. So, **therefore there can't be weapons of mass destruction in Iraq.**

### Exercise II

*Individuate explicit and implicit premises in this argument*

I think she's not home. If she drove home, then her car would be in the driveway. And it's raining, so she didn't walk home.

**Answer:**

**Explicit:**

- **If she drove home, then her car would be in the driveway.**
- **It's raining, so she didn't walk home.**

Both premises are explicit and understandable. She did not walk home because of bad weather and she is probably on a way home driving a car. But there is one more premise that is implicit:

- Her car is not in the driveway

So, with all the three premises we can easily come up with the given conclusion:

She is not home

### Exercise III

*Individuate the implicit premise in this argument*

“Positive thinking cannot help you win the lottery. If it could, then lots of people would win.”

**Answer** Firstly, I would point an explicit premise that is

If it [*positive thinking*] could, then lots of people would win.

Then, there are two more implicit premises:

A small number of people win lotteries.

The amount of people thinking positive is much bigger than the amount of lottery winners

After pointing out these implicit premises, the conclusion becomes obvious:

Positive thinking cannot help you win the lottery

But I would paraphrase it in this way:

Positive thinking does not related to winning the lottery

### Exercise IV

*Reconstruct this argument*

The starter must be broken. If the car won't start, then it's either the starter, the alternator, or the battery that's the problem. It won't start. And we've ruled out the alternator since we just put a new one in, and it can't be the battery because it's fully charged.

**Answer** So, to make this argument a way better, I would reorganize sentences and add some linking words that way:

If the car won't start, then it's either the starter, the alternator, or the battery that's the problem. And **because** we've ruled out the alternator since we just put a new one in, and it can't be the battery because it's fully charged, **there must be a problem with starter.**

### Exercise V

*Reconstruct this argument*

I'm pretty sure that if you get caught base jumping in a national park, it is a misdemeanor offense. And if you get convicted of a misdemeanor offense, it's a parole violation. I heard that while he was on parole, Fernando went base jumping in Yosemite and got caught. And if Fernando violates his parole one more time, immigration services is going to deport him. So I think he is going to get deported. That's too bad. He was a great guy.

**Answer** Firstly, I would like to eliminate some portion of the text that is not related to the argument:

... That's too bad. He was a great guy.

Then, I would simplify sentences and make them not opinion, but just facts:

If you get caught base jumping in a national park, it is a misdemeanor offense. And if you get convicted of a misdemeanor offense, it's a parole violation ... He is going to be deported.

So, to make the argument more valid and clear, I would add an implicit premise:

Fernando went base jumping one more time.

Why? So a speaker is convinced that Fernando is going to get deported. But, premise only tells us that if Fernando **is caught one more time**, he will be deported. Since he is about to get deported, it means that he violated the parole once again.

If you get caught base jumping in a national park, it is a misdemeanor offense. And if you get convicted of a misdemeanor offense, it's a parole violation. Fernando went base jumping in Yosemite and got caught. And if Fernando violates his parole one more time, immigration services is going to deport him. Fernando went base jumping one more time, so he is going to be deported.

### Exercise VI

*Evaluate the following argument*

1. If Idaho is larger than California, then it is larger than Alaska.
2. Idaho is larger than California.

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3. Therefore, Idaho is larger than Alaska.

**Answer:** We have two premises, both of them are explicit:

Idaho is larger than California. (Premise 1)

If Idaho is larger than California, then it is larger than Alaska.  
(Premise 2)

The conclusion is:

Therefore, Idaho is larger than Alaska. (Conclusion)

Argument is valid, because if we assume the truth of both premises, Idaho cannot be smaller than Alaska, because according to the Premise 2 it is larger than Alaska if it is larger than California, that is true according to the first premise.

Argument is quite good. All premises are not ambiguous and clear. We cannot add anything more to support our conclusion.

## Exercise VII

*Evaluate the following argument*

1. Idaho is south of Canada.
  2. Nevada is south of Idaho.
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3. Therefore, Texas is south of Oklahoma.

**Answer:** We have two premises, both of them are explicit:

Idaho is south of Canada. (Premise 1)

Nevada is south of Idaho. (Premise 2)

The conclusion is:

Therefore, Texas is south of Oklahoma. (Conclusion)

Argument is invalid: even if all the premises are true, the conclusion still might be false, because there is no connection between information in premises and information in the conclusion.

Argument is bad and senseless. We can conclude that “*Nevada is south of Canada*”, but nothing about Texas and Oklahoma, since there are different places at all.

## Exercise VIII

*Define the 3 types of irony we came across in the lecture (without looking at slides or internet) then give an example for each.*

**Answer:** Irony is frequently divided into three types:

- **Situational:** Situational irony is when the outcome of some situation is totally different from the expected one. For example: *Before the lecture Innokentiy said that he was the best mathematician in his school, but when it came to solving problem, he could not solve anything.*

- **Dramatic:** This specific type of irony often appears in movies, performances, books and so on. It is when the audience has more information, than characters. For example: *Marie conducted a party at her house while parent went out to the airport. But the flight was cancelled, so they had to come back home. Audience knows that they are about to return, Marie does not. So, it will be an ironical surprise for her.*
- **Verbal:** It is when the speaker says something the opposite to what they mean. It is quite popular in Russian culture. Like saying that *it is a quite simple task* when you are in front of the Final Exam in Math on IBC2020.