Traditional Logic

Traditional logic:
- The science of right thinking
- Study of classical syllogism
- Traditional logic trains the mind to respect truth and assumes a Christian view of truth

- Logic deals with the distinction between correct and incorrect reasoning

- Purpose of logic is not to discover truth.
- Logic serves to lead us from one truth to another

Aristotle is the father of logic
Formal logic hasn't changed much at all since the time of Aristotle (384-322 B.C.)

2 main branches of logic:
- *Formal (or minor) logic*: interested in the form or structure of reasoning; concerned with the method of deriving one truth from another
- *Material (or major) logic*: concerned with the content of argumentation; deals with the truth of the terms and the propositions in an argument

3 important terms in logic: truth, validity, & soundness

- Don't call a statement logical or illogical. Call it true or false.
- Don't call an argument true or false (which contains several statements of fact)
- Call an argument valid or invalid

Truth – correspondence of a statement to reality

Validity is the term you use to say an argument is logical
An argument is valid when its conclusion follows logically from its premises

Soundness is a term applied to an argument to say something about its truth and validity
Indicates all premises in an argument are true and that the argument is valid

If an argument is sound its premises must be true and it must be valid

Components of an argument
All components of an argument have at least two premises and a conclusion

3 mental acts that make up logical processes:

● **Simple apprehension** – the *mental act* when we first form a concept of something in our mind; you do not yet affirm or deny anything at this point
A concept that we transform into a word: the concept is the simple apprehension and the word is the term (For example if you think about these notes/outline from the book that you are reading- this is the simple apprehension. Calling these notes an outline would be the term)

      Term – the *verbal expression* of simple apprehension

● **Judgment** – we judge any time we think that something *is* something else (affirmation) or that it *is not* something else (denial). To judge is to affirm or deny
The *judgment* is the mental act when you think something about something; the *proposition* is the statement you make to express that thought about the judgment

● **Deductive inference** – when you make logical connections in your mind between the terms in the argument that shows that the conclusion either follows or does not follow from the premises. When you verbally express this in an argument – this deductive inference is in the form of a *syllogism*

This is when you make progress in knowledge – through the process of deductive inference, expressed in a syllogism, that you go from one truth or set of truths to another truth

These 3 mental acts correspond to 3 verbal expressions:

3 verbal expressions

● **Term** – the *verbal expression* of simple apprehension

● **Proposition** – the verbal expression of *judgment*; the statement you make to express the thought about your judgment

● **Syllogism** - the verbal expression of deductive inference

Mental Act	Verbal Expression
Simple Apprehension	Term
Judgment	Proposition
Deductive Inference	Syllogism

<u>Chapter 1</u>

3 things happen when we have a simple apprehension:
- You perceive it with your senses – *sense perception*
- You form an image of it in your mind – *mental image*
- You conceive its meaning – this conception of meaning is what you refer to when speaking of a simple apprehension - *concept*

Sense perception
- occurs in the mind
- lasts as long as you see/hear/smell/taste/touch an object and stops when you stop doing these things
- sense perception is the act of seeing/hearing/smelling/tasting/touching

Mental image
- We often have an image form in our mind when we have a sense perception
- A mental image can be present when you aren't actively seeing/hearing/smelling/tasting/touching
- Mental image is the image of an object formed in the mind as a result of a sense perception of that object
- Something tangible and material (shape, color, etc.)

Concept
- The idea
- You can have the concept without the sense perception and without the mental image (you and a friend can both understand what a 'man' is, but can both have different mental images about what a 'man' is)

Simple Apprehension
- A simple apprehension – understanding something – is different from making a judgement about it
- Simple apprehension takes place before making a judgment
- Simple apprehension is an act by which the mind grasps the concept or general meaning of an object without affirming or denying anything about it
- Mental image is something tangible and material; the simple apprehension is the grasp of something intangible and immaterial
- It is the act of understanding a universal meaning
- Grasping the essence (or meaning) of the object

- Refers to both the act of conceptualizing something and also the entire process leading up to that act

Abstraction
- The process by which a simple apprehension is derived from a sense perception and mental image
- The object is lifted from the level of the sense to the level of intellect

Chapter 2

• **Simple apprehension**: (definition):
act by which the mind grasped the essence or meaning of a thing without affirming or denying anything about it; different from sense perception, image, and judgement; concept

• 2 properties of simple apprehension:
(properties of something distinguish it and show how it differs from other things
- Comprehension
- Extension

• **Comprehension**: the completely articulated sum of the intelligible aspects or elements (or notes) represented by a concept

You can break down the complex elements of a concept by the use of the idea of comprehension

The idea of 'man' or 'animal' is a complex concept. You can break down the complex concept into simple concepts called **notes** (**notes** are simple concepts or categories):

Porphyrian Tree
A way to break down a complex concept into the simple concepts/notes that make it up:
- Substance (it is something rather than nothing; it exists)
- Material (it has body rather than being purely spiritual) vs. non-material (spiritual)
  o Material > has body
- Living vs. non-living (mineral)
- Sentient (it has senses- sight, hearing, etc.) vs. non-sentient (a plant)
- Rational (man) vs. non-rational

To ask: What is the comprehension of a concept? = to ask: What is a man (or animal or chair, etc.)?

• **Extension**
Asking: to what does the concept 'man, chair, etc' refer to?

What is the extension of animal? All the animals that have ever lived, are now living, and that will ever live

Comprehension tells us what the essence of a thing is; extension tells us the things to which that essence applies

Relationship between comprehension and extension:
- The greater the comprehension/number of notes a concept has, the less extension it has
- The more extension it has, the less comprehension

The comprehension of a simple apprehension is a description of what a concept is.
The extension of a concept is a description of the things to which a concept applies

<u>Chapter 3</u>

A *concept* is the mental act involved in simple apprehension
Term is the verbal expression of the concept – words that verbally express a concept

2 properties of concepts: comprehension & extension
- *Comprehension* of a concept was the complete sum of the notes represented by that concept.
- The *extension* of a concept is the sum of real things to which the concept refers. (to all men who are, were, and ever will be)

2 properties of terms: **signification** and **supposition**

Terms can be divided according to their **signification** 3 ways:
- **Univocal terms** – terms that have exactly the same meaning no matter when or how they are used. They always mean the same thing. They never mean one thing when used by one person and another thing when used another time or by someone else. Comes from Latin words: unus & vox = one voice
- **Equivocal terms** – terms that although spelled and pronounced exactly the same, have entirely different and unrelated meanings. (pitcher – could be a baseball play or a container for a drink). These words are often used in puns. Comes from Latin words: aequus & vox = equal voice
- **Analogous terms** – terms applied to different things but have related meanings; spelled & pronounced the same but have different, but related meanings. Often used in poetry and literature. ("Let the dead bury the dead" – the spiritual dead to bury the physically dead) or (the word good – can refer to morally upstanding or proficient at a sport)

Terms can be divided up according to their **supposition** in 3 ways:
- **Verbal existence – material supposition** - when a term refers to something as it exists verbally – we refer to the word or a concept rather than the mental idea or real idea (the word "man" vs. the idea of a man or a real, physical man)
- **Mental existence – logical supposition** – when we refer to something as it exists logically – the mental idea or concept (rather than the actual word or real, physical thing) – man has 5 notes (instead of any real man or the word "man")
- **Real existence – real supposition** – when we refer to something as it exists in the real world rather than the mental idea or the word (men who actually exist in the world)

Review:
3 aspects of logic: simple apprehension, judgment, and deductive inference
These 3 aspects are verbally expressed by terms, propositions, and syllogisms

Mental Act	Verbal Expression
Simple apprehension	Term
Judgment	Proposition
Deductive inference	Syllogism

<u>Chapter 4</u>

Just as *simple apprehension*, as a mental act, has a corresponding verbal expression- the *term;*
Judgment has a mental act whose verbal expression is called a **proposition**
Judgment is the act by which the intellect unites by affirming, or separates by denying
A judgment unites or separates two concepts
        Man is an animal (joining 2 concepts)
        Man is not God (separating 2 concepts)

The 2 concepts that a judgment unites or separates are the **subject** and **predicate**
        Subject: that about which we are saying something; the concept about which we are
        affirming or denying something
        Predicate: what we are saying about the subject; what we are affirming or denying about it

            Man is an animal
             ^   ^
           Subject   Predicate

Proposition: the verbal expression of a judgment;
a sentence or statement which expresses truth or falsity

Not all statements/sentence are propositions expressing judgment (for example: questions, commands, exclamations, greetings, etc.)

3 elements of proposition:
- **Subject-term**- verbal expression of the subject of a judgment
- **Predicate-term**- verbal expression of the predicate of a judgment
- **Copula**- the word in the proposition that connects or relates the subject to the predicate; some form of the verb "to be" ('is' or 'are')

        Man *(subject)* **is** *(copula)* **an animal** *(predicate)*

        The little brown-haired boy *(subject)* is *(copula)* very loud *(predicate)*

Any sentence we use in logic must have a certain form. The form is must have in order to be handled logically is called a proposition's **logical form** – which means that they must show all 3 elements of a logical proposition clearly

Ordinary sentence: The little-brown-haired boy screams very loudly

Converted into a logical form: The little brown-haired boy is a child who screams very loudly.
(reworked the predicate and copula to have a form of 'to be')

<u>Chapter 5</u>

Classification of Propositions – 4 categories

A: All S is P

      A stands for *affirmo* (Latin for affirm) – This proposition affirms something about S
      (All men are mortal. All cars are fast.)

I: Some S is P

      I comes from the second vowel in *affirmo* – This also affirms something about S, but not all S's
      (Some men are mortal. Some cars are fast.)

E: No S is P

      E comes from first vowel in *nego* (Latin for negate) – It is negative; says something about
      what S is NOT
      (No men are mortal. No cars are fast.)

O: Some S is not P

      O comes from second vowel in *nego* – also says something negative, but not all S's, only some
      (Some men are not mortal. Some cars are not fast.)

Quantifier
- In addition to the subject-term, the predicate-term, and the copula is the **quantifier**
- The **quantifier** tells us what the *quality* and *quantity* of a proposition is
- The 2 characteristics of categorical statements: quality & quantity
- 4 types of quantifiers: All, some, no/none, some…not

Quality
- Quality tells if something is *affirmative* or *negative*
- A and I statements are affirmative
- E and O statements are negative

Quantity
- Quantity tells if something is *universal* or *particular*
- It is *universal* if it says something about ALL of the members of the class
- It is *particular* if it says something about only SOME of the members of the class

- Many statements do not have a quantifier (ex.- frogs are ugly)
- General rule for statements that do not contain a quantifier is that *all* is intended unless *some* is clearly indicated. (so, we assume it is "all frogs are ugly")
- There are also statements where the subject-term is an individual. These types of statements are *singular*. (ex.- Tyler is a Bobo.) – It is universal

Quality & quantity statements summary:

      A: Affirmative-Universal
      I: Affirmative-Particular
      E: Negative-Universal
      O: Negative-Particular

Chapter 6

Contradictory & Contrary Statements

There are 2 relationships categorical statements can have to one another:
- **Opposition** (there are 4 types of opposing relationships)
- **Equivalence** (there are 3 types of equivalent relationships)

Opposition: 2 things have a relation of opposition
They *affirm* and *deny* the same predicate of the same subject
They can be related in opposition in 4 ways: contradictory, contrary, subcontrary, & subalternate

Rule of Contradiction:
Contradictory statements are statements that differ in *quality* (affirmative or negative) & *quantity* (universal or particular)
This is the test you apply to determine whether 2 statements are contradictory. Both must differ in both quality & quantity
A & O statements and E & I statements are the only 2 contradictory pairs of statements since they both differ in quality & quantity

First Law of Opposition:
Contradictories cannot at the same time be true nor at the same time be false.
This law tells us an essential characteristic of the relationship between contradictory statements.
(You can't say all men are mortal- A statement and that some men are not mortal- O statement and both statements be true. And both can't be false at the same time. One must be true and one must be false.)

Rule of Contraries:
Two statements are contrary to one another if they are both universal but differ in quality.
They are the same in quantity, but differ in quality.
Both must be universal but differ in quality.
A & E statements

Second Law of Opposition:
Contraries cannot at the same time both be true, but can at the same time both be false.
All S is P & No S is P = All men are happy & no men are happy
Both cannot be true. But both could be false.

Chapter 7

Subcontraries &Subalterns

Rule of Subcontraries:
Two statements are subcontrary if they are both particular statements that differ in quality.
One statement is affirmative and one is negative, but both are particular
I & O statements are subcontrary (I is particular affirmative and O is particular negative)

Third Law of Opposition:
Subcontraries may at the same time both be true, but cannot at the same time both be false.
If one is false, the other is true

Rule of Subalterns:
Two statements are subalternate if they have the same quality, but differ in quantity.
The statements have the same subject, predicate, and copula
One statement is universal, the other is particular
Two combinations that are subalternate: A & I and E & O statements – both have the same quality but differ in quantity

Fourth Law of Opposition:
Subalterns may both be true or both be false.
If the particular is false, the universal is false
If the universal is true, then the particular is true
Otherwise their status is *indeterminate*

A & I statements- if some S is P is false, then we know that all S is P is also false (or both true)
E & O statements- If some S is not P is false, then No S is P must also be false (or both true)

Indeterminate:
If All S is P is false, we can't know if Some S is P is true or false
If Some S is P is true, we can't know whether All S is P is true or false
If No S is P is false, we can't know if Some S is not P is true or false
If Some S is not P is true, we can't know if No S is P is true or false

(If we know that all men are happy, then we know it is true that some men are happy. But if we know that some men are happy, we can't know that all men are happy. And if we know that no men are happy, then we know that some men are not happy. But if some men are not happy, we don't know if no men are happy.)

Chapter 8

Distribution – the status of a term in regard to its extension (universal or particular)

If a term is distributed then the term refers to all the members of the class of things denoted by the term

A term is **distributed** if we are using it universally
It refers to all members of the class
If the term is used particularly, only referring to some members of the class, it is **undistributed**

Distribution of Subject-Term:
If statement is universal, the subject-term is distributed
If statement is particular, the subject-term is undistributed

A statement (All S is P) refers to all S's (is universal) and is distributed
E statement (No S is P) refers to all S's (is universal) again, and is distributed
O statement (Some S is not P) refers to only some S's (is particular), and is undistributed
I statement (Some S is P) refers to only some S's (is particular), and is undistributed

Distribution of Predicate-Term:
In affirmative propositions, the predicate-term is always particular – so undistributed
In negative propositions, the predicate is always universal – so distributed

Distribution of Terms

|	*Subject-Term*	*Predicate-Term*
A (All S is P)	Distributed	Undistributed
I (Some S is P)	Undistributed	Undistributed
E (No S is P)	Distributed	Distributed
O (Some S is not P)	Undistributed	Distributed

A statement – All S is P - All men are animals
The predicate is taken as particular, so it is undistributed
Animals has greater extension than man. Man is only one of many kinds of animals.
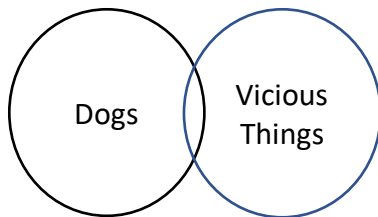The concept with greater extension has a larger circle than a concept with lesser extension
Man is identical with part of P (animal). Man is distributed, animal is not
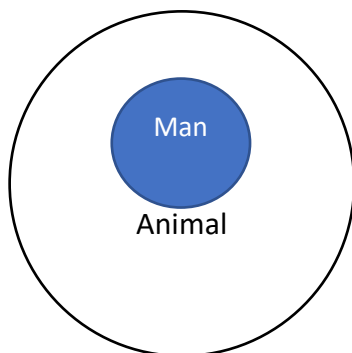
I statement – Some S is P – Some dogs are vicious things
Talking about some dogs and some vicious things, not all vicious things (other things are vicious than dogs)

E statement – No S is P – No man is a reptile
No man is a reptile. All reptiles are not men. Circles do not overlap at all. There are men and there are reptiles, but nothing can be both.

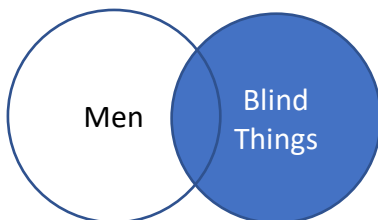The subject & predicate are both distributed (both universal)
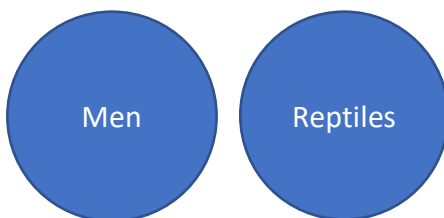
O statement – Some S is not P – Some men are not blind
Some, not all S's – subject is not universal/distributed
P is universal/distributed – the entire class of blind things
The predicate represents the whole circle/all blind things (There are some blind things that are not men)
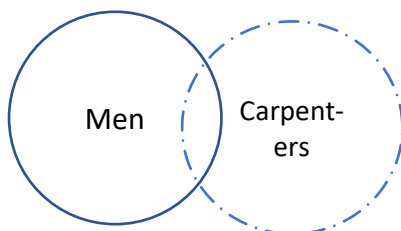

Other diagrams for I & O statements

I statement – Some men are carpenters.
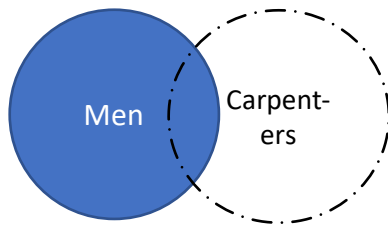There are no carpenters who are not men. All carpenters are men.
The broken line of the circle indicates that there is nothing in that part of the circle

O statement – Some men are not carpenters

There are no carpenters who are not men.
The broken line indicates that there are no carpenters outside the class of men.

Different from O statement- some men are not blind. There are some creatures besides men who are blind.

Must know difference between I & O statements for these diagrams.
Ask whether there is any member of the predicate class that is not a member of the subject class. If there is, then you use the diagram with the solid line. If there is not, then you use a diagram with a broken line.

Chapter 9

Obversion, Conversion, and Contraposition

Logically equivalent- the way we say two statements are logically the same
There are 3 ways to convert propositions into their logical equivalent:
- Obversion
- Conversion
- Contraposition

Obversion
To obvert a sentence you have to:
- change the quality of the sentence and
- negate the predicate
- Obversion works on all 4 kinds of propositions (A, I, E, O)
To change the quality in the statement:
- if it is affirmative, you make it negative
- if it is negative, you make it affirmative
- Do not change the quantity
- To negate the predicate, you simply place *not* in front of it

All S is P ⇒ No S is not P
No S is P ⇒ All S is not P
Some S is P ⇒ Some S is not non-P
Some S is not P ⇒ Some S is not P

(All men are mortal ⇒ No men are not mortal)
(No men are gods ⇒ All men are not gods)

These statements logically mean the same thing

4 ways of phrasing the predicate in I statements (double negation)
- Place two "not's" at the beginning of the predicate
- Make the second "not" a "non" and attach it to the predicate word with a dash
- Place 'im,' un,' 'in,' or 'ir' at the beginning of the predicate (mortal ⇒ immortal)
- Apply the rule of double negation

Double Negation – a term which is not negated is equivalent to a term that is negated twice and vice versa

Some S is P ⇒ Some S is not not P ⇒ Some S is P (again)
Some men have brown hair ⇒ Some men do not have non-brown hair (sounds awkward)

Conversion
Interchange the subject and predicate
      No S is P $\Rightarrow$ No P is S
      Some S is P $\Rightarrow$ Some P is S

Only works with E & I statements (can't use this with A & O statements)

(E statement (No S is P) - No men are gods $\Rightarrow$ No gods are men
(I statement (Some S is P) - Some men have brown hair $\Rightarrow$ Some things that have brown hair are men

Doesn't work:
A statement (All S is P) – All men are animals $\Rightarrow$ All animals are men
O statement (Some S is not P) – Some men are not accountants $\Rightarrow$ Some accountants are not men
These are not logically equivalent statements

Partial conversion of the A statement:
If an A statement is true, it can be converted into a true I statement
Interchange the subject and predicate and then change the statement from universal to particular
All dogs are animals $\Rightarrow$ Some animals are dogs

Contraposition
Only works with A & O statements

- Obvert the statement
- Convert the statement
- Obvert the statement again

All men are mortal
Obvert: No men are non-mortal
Convert: No non-mortals are men
Obvert: All non-mortals are non-men

All S is P $\Rightarrow$ All non-P is non-S
Some S is not P $\Rightarrow$ Some non-P is S

Deductive Inference

Syllogism- verbal expression of deductive inference
A syllogism is a group of propositions in orderly sequence, one of which (the consequent) is said to be necessarily inferred from the others (antecedent)
It always contains 2 premises (antecedent) and a conclusion (consequent)

Reasoning- the act by which the mind acquires new knowledge by means of what it already knows

2 kinds of reasoning:
- Deduction (such as deductive inference)
- Induction

3 acts occur in our mind when we make an argument:
- We perceive the 1st premise to be true
- We perceive the 2nd premise to also be true
- Act of deductive inference – the conclusion must also be true   > Consequent
              All men are mortal (1st premise)
              Socrates is a man (2nd premise)
              Therefore, Socrates is mortal (Consequent/conclusion)

Antecedent- the first two steps together
The recognition that each of the two premises is true go before or precede the act of reasoning

Consequent- the conclusion in our reasoning (3rd/final step in reasoning)

Deductive Inference- act by which the mind establishes a connection between the antecedent and the consequent
It is the mental act that corresponds to the verbal expression/syllogism

Validity

Essential Law of Argumentation: if the antecedent is true, the consequent must also be true
All valid syllogisms are governed by this law
In a valid argument, if the antecedent is true, then conclusion must also be true
This rule has 2 corollaries:
- If the syllogism is valid and the consequent is false, then the antecedent (one or both of the premises) must be false
    o All men are sinners (antecedent 1)
    o My dog spot is a man (antecedent 2) - false
    o Therefore, my dog Spot is a sinner (Consequent) - false
- In a valid syllogism with a true consequent, the antecedent is not necessarily true (one or both of the premises can be false)
    o All vegetables are philosophers
    o Socrates is a vegetable
    o Therefore, Socrates is a philosopher (just because the conclusion is true doesn't mean that the antecedent must be true)

3 terms in a syllogism:
- **Major term**: predicate of the conclusion
- **Minor term**: subject of the conclusion
- **Middle term**: term that appears in both premises, but not in the conclusion

All men (middle term, M) are mortal (major term, P)
Socrates (minor term, S) is a man (middle term, M)
Therefore, Socrates (minor term, S) is mortal

All M is P
All S is M
Therefore, All S is P

Major premise: premise that contains the major term (first premise)

Minor premise: premise that contains the minor term (second premise)

The major premise should always be put first in a syllogism
A syllogism is properly formed if the major premise is first, the minor premise – second, and the conclusion- third.

4 Principles of Syllogism that are fundamental to all logical thought:
- **Principle of Reciprocal Identity**: 2 terms that are identical with a third term are identical to each other (if S is identical with M, and P is identical with M, then S is identical to P)
- **Principle of Reciprocal Non-Identity**: 2 terms, one of which is identical with a third term and the other of which is nonidentical with that third term, are nonidentical to each other (if S is identical with M, but P is not identical with M, then S is not identical with P)
- **Dictum de Omni**: What is affirmed universally of a certain term is affirmed of every term that comes under that term (Mortality is affirmed universally of man, so every term that comes under the extension of man shares in it. Since Socrates is under the extension of man, he shares in mortality)
- **Dictum de Nullo**: What is denied universally of a certain term is denied of every term that comes under that term
  > No man is God
  > Socrates is a man
  > Therefore, Socrates is not God
  > (Universally, men cannot be God. And since Socrates comes under "men" – he also cannot be God)

7 rules of validity for categorical syllogisms

A syllogism must comply with all of these rules in order to be valid. If it violates any of these rules, then the conclusion cannot logically follow from the premises

Terminological Rules:
1- There must be 3 and only 3 terms
2- The middle term must not occur in the conclusion

Quantitative Rules:
3- If a term is distributed in the conclusion, then it must be distributed in the premises
4- The middle term must be distributed at least once

Qualitative Rules:
5- No conclusion can follow from 2 negative premises
6- If the 2 premises are affirmative, the conclusion must also be affirmative
7- If either premise is negative, the conclusion must be negative

Chapter 11

Terminological Rules for Categorical Syllogisms
- Have to do with the proper use of terms in a syllogism

Rule 1: There must be 3 and only 3 terms
- Every syllogism must have a major term, minor term, and middle term
- This rule can be violated in 2 ways:
  - **Fallacy of 4 Terms**
    Happens when there are more than 3 terms. None of the terms are connected (All mammals have hair. All horses have manes. Therefore, some mammals have hair.)
  - **Fallacy of Equivocation**
    Ambiguous middle term/middle term is used equivocally (2 different meanings)
    (All planes are 2-dimensional. All 747s are planes. Therefore, all 747s are 2-dimensional)

Rule 2: The middle term must not occur in the conclusion
- The middle term is the term that connects the 2 terms that appear in the conclusion
- If the middle term appears in the conclusion, then it would have to stand in the place of the minor or major term, meaning they can't be connected.
  (All pants are living things. All animals are living things. Therefore, all living things are plants or animals.)

Chapter 12

Quantitative Rules for Categorical Syllogisms
- Quantitative rules have to do with the quantity of the statements in a syllogism – whether the statement is universal or particular

Rule 3: If a term is distributed in the conclusion, then it must be distributed in the premises
- This rule prevents us from trying to say more in the conclusion than is contained in the premises
- Distribution- status of a term in regard to its extension – how much a term refers to
  - o Distributed- it refers to all possible members of a class
  - o Undistributed- a term does not refer to all members of the class it denotes
- All angels are spiritual beings. No men are angels. Therefore, no men are spiritual beings. The conclusion here assumes something that is not in the premises. The conclusion says more than what the premises say- it goes further than the premises allow. There is a term in the conclusion that is distributed that is not distributed in the premises.
- If a term is distributed in the conclusion but is not distributed in either of the premises, then the conclusion is going beyond the premises by stating more than the premises justify
- Syllogisms that violate rule 3 commit the **Fallacy of Illicit Process** and are invalid. This happens in 2 ways:
  - o **Fallacy of Illicit Major** – when the major term (predicate of conclusion) is distributed in the conclusion but not in the major premise
  - o **Fallacy of Illicit Minor** – when the minor term (subject of conclusion) is distributed in the conclusion but not in the minor premise.
- All men are animals. All men are mortal. Therefore, all mortals are animals.
  This doesn't work. The minor term (mortal) is undistributed in the minor premise, and then is distributed in the conclusion. This is invalid. You cannot conclude anything about all mortals because the second premise only refers to some mortals. The conclusion cannot have greater extension than the premise.

Rule 4: The middle term must be distributed at least once
- This rule ensures that the major and minor terms get connected in the premises.
- **Fallacy of Undistributed Middle** – The middle term is not distributed in either premise, so it cannot connect the minor and major terms. The premises are insufficient to justify the conclusion.
  (All angels are spiritual beings. All men are spiritual beings. Therefore, all men are angels.)

<u>Chapter 13</u>

Qualitative Rules for Categorical Syllogisms
- Deals with the quality of statements in a syllogism – whether it is affirmative or negative

Rule 5: No conclusion can follow from 2 negative premises
- This rule prevents us from trying to say more in the conclusion than is contained in the premises.
- **Fallacy of Exclusive Premises** – If both premises are negative, the argument is invalid (No plants are animals. Some minerals are not animals. Therefore, some minerals are not plants.)

Rule 6: If the 2 premises are affirmative, the conclusion must also be affirmative
- You cannot derive a negative conclusion from two affirmative premises.
- **Fallacy of Drawing a Negative Conclusion from Affirmative Premises** (All Mustangs are fast cars. All fast cars are purple. Therefore, some things that are purple are not Mustangs.)

Rule 7: If either premise is negative, the conclusion must be negative
- Just because we say that some are excluded from a group, it does not preclude that possibility that all may be
- **Fallacy of Drawing an Affirmative Conclusion from a Negative Premise** (All cannibals are bloodthirsty. Some accountants are not bloodthirsty. Therefore, some accountants are cannibals.)