Essentials of Formal Logic
with Joelle Hodge

Lesson 30: Chapter 8.3

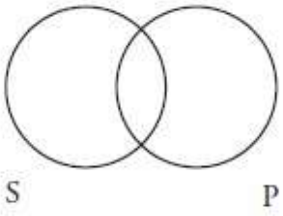
Outline:

Chapter 8, Lesson 8.3

- Determining the Validity of Syllogisms
- Evaluating Validity: Terminological Rules 3 and 4
  - Rule 3: The middle term must be distributed at least once.
  - Rule 4: If a term is distributed in the conclusion, it must be distributed in the premises as well.
- Points to Remember
  - The terminological rules pertain to the number and distribution of terms in a syllogism.
  - In universal affirmative **A** statements, the subject term is distributed, but the predicate term is undistributed.
  - In universal negative **E** statements, both the subject and predicate terms are distributed.
  - In particular affirmative **I** statements, the subject and the predicate terms are undistributed.
  - In particular negative **O** statements, the subject term is undistributed, but the predicate term is distributed.
- Undistributed verses Distributed defined
  - A term in a syllogism is considered distributed if it refers to all the members of its class.
  - If a proposition is talking about "No men," then that term is also distributed because it is still talking about all men—we are denying something about all of them.
  - On the other hand, a term is considered to be undistributed when we are only talking about some of the class. For instance, if a proposition contained the subject "some men," then that subject is undistributed because it is only talking about some of the members in a class.
  - If you notice, it is easy to determine the distribution of the subject term in all of the propositions because of the quantifiers "all," "some," "no," and "some . . . not."
- Venn diagrams to visually see and understand what those definitions look like in A, E, I, and O statements.
  - Since the quantifier only applies to the subject, it will not help us in determining the distribution of the predicate term.
  - In fact, the best way to understand the distribution of the predicate term is to use a special type of diagram called a Venn diagram to help you do it.

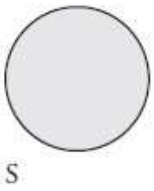
- Venn diagrams use circles that represent an entire class of items to demonstrate how terms relate to each other in propositions.
- For instance, if we are diagramming a proposition with the terms S and P in the proposition, we place two interlocking circles, one that illustrates all of the class of S and one that illustrates all of the class of P. We make them interlocking because the terms are interrelated through their connection in the proposition.

Figure 1



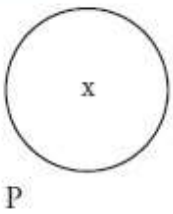
- Notice that once we have done this, we have created three important areas: the area on the left, which is All S and no P; the area in the middle which is S and P; and the area on the right which is All P and no S. It is important to remember that a Venn diagram of two interlocking circles has these three areas.
- For instance, if we wanted to say that there are no items in class S, we would shade it (Figure 2).

Figure 2



- On the other hand, when we want to illustrate that there are some items in a class, we put an X in it. For instance, if we were to say that there were some items in class P, we would illustrate it like this:

Figure 3



- Let's look at the two common shading patterns in overlapping circles.

Figure 4

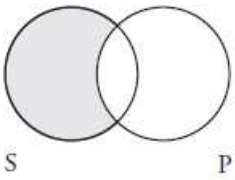
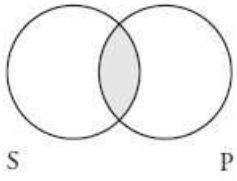


Figure 5



- Rules 3 and 4 evaluate for validity – distribution applied
  - Rule 3: The middle term must be distributed at least once.

	Universal Affirmative *A*	Universal Negative *E*	Particular Affirmative *I*	Particular Negative *O*
Subject Term	**Distributed**	**Distributed**	**Undistributed**	**Undistributed**
Predicate Term	**Undistributed**	**Distributed**	**Undistributed**	**Distributed**

  - Rule 4: If a term is distributed in the conclusion, it must be distributed in the premises as well.
    - An **illicit major** means the major term is distributed in the conclusion but not in the major premise.
    - That's right, an **illicit minor** occurs when we make an inappropriate inference with the minor term.