Philosophy 57 — Day 17

- Mid-Term returned today (briefly discuss)
  - 87–100 (A); 80–86 (B); 74–79 (C); 60–73 (D); < 60 (F)
- WebVenn Demonstration (A very useful online tool!)
- Back to Chapter 5
  - I will be skipping sections 5.3, 5.6, and 5.7
  - Today: sections 5.2–5.3
  - Time Permitting: section 5.4 (reducing # of terms)

Chapter 5: Categorical Syllogisms & Venn Diagrams I

- Four Examples (see next two slides for final diagrams & answers):

  (1) If a person is a republican, then that person is not a democrat. Therefore, all big spenders are not Republicans, since all big spenders are democrats.

  (2) Some latchkey children are not kids who can stay out of trouble, for some youngsters prone to boredom are latchkey children, and no kids who can stay out of trouble are youngsters prone to boredom.

  (3) Some individuals prone to violence are are not men who treat others humanely. Some police officers are individuals prone to violence. Therefore, some police officers are not men who treat others humanely.

  (4) No M are P. All M are S. Therefore, Some S are not P.

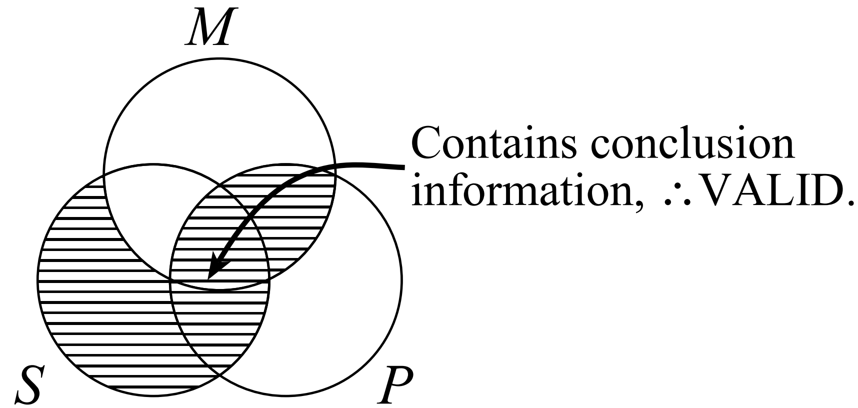
  * Step 1: Translate from English passage into three categorical claims.
  * Step 2: Symbolize, and place categorical syllogism in standard form.
  * Step 3: Draw Venn Diagram for premises of Categorical Syllogism.
  * Step 4: Is conclusion information contained in the premise diagram?

Syllogism in standard form

(1) No P are M.
All S are M.
$\therefore$ No S are P.

Mood–Figure: **EAE**–2

Venn Diagram of Premises

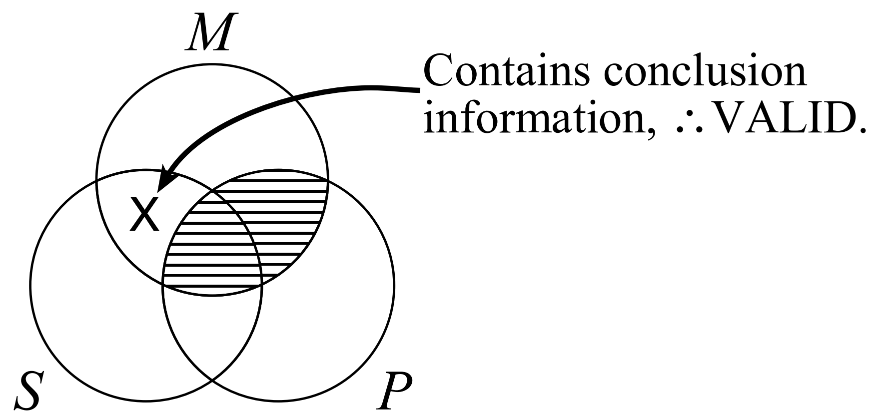


Syllogism in standard form

(2) No P are M.
Some M are S.
$\therefore$ Some S are not P.

Mood–Figure: **EIO**–4

Venn Diagram of Premises

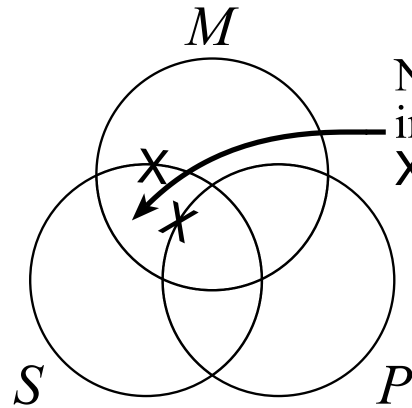


Syllogism in standard form

(3) Some M are not P.
Some S are M.
$\therefore$ Some S are not P.

Mood–Figure: **OIO**–1

Venn Diagram of Premises



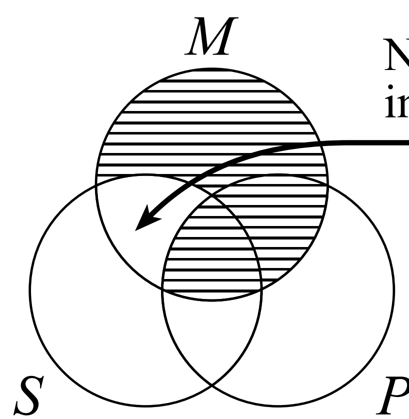
NOT contain conclusion information, $\therefore$ INVALID.
X NOT (necessarily) outside P

Syllogism in standard form

(4) No M are P.
All M are S.
$\therefore$ Some S are not P.

Mood–Figure: **EAO**–3

Venn Diagram of Premises



NOT contain conclusion information, $\therefore$ INVALID.
NO X here at all!

Chapter 5: Categorical Syllogisms & Venn Diagrams II

- Four More Examples (see next two slides for diagrams & answers):

(5) A few communications satellites are rocket-launched failures. The only communications satellites are devices with antennas. Therefore, there are rocket-launched failures which are devices with antennas.

(6) No *C* are *O*.
Some *D* are not *O*.
Therefore, Some *D* are not *C*.

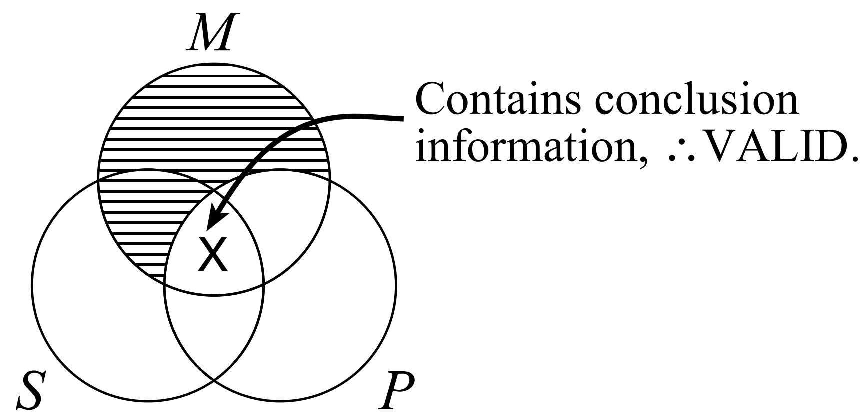
(7) Not all snowflakes are uniform solids.
Only six-pointed crystals are snowflakes.
Therefore, some six-pointed crystals are not uniform solids.

(8) No *P* are *M*.
Some *M* are not *S*.
Therefore, Some *S* are not *P*.

Syllogism in standard form	Venn Diagram of Premises

(5) All M are P.
Some M are S.
$\therefore$ Some S are P.

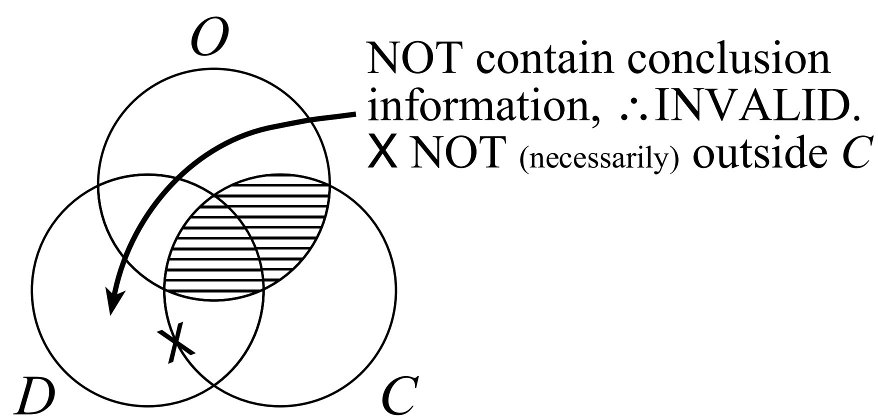
Mood–Figure: **AII**–3



Syllogism in standard form	Venn Diagram of Premises

(6) No C are O.
Some D are not O.
$\therefore$ Some D are not C.

Mood–Figure: **EOO**–2

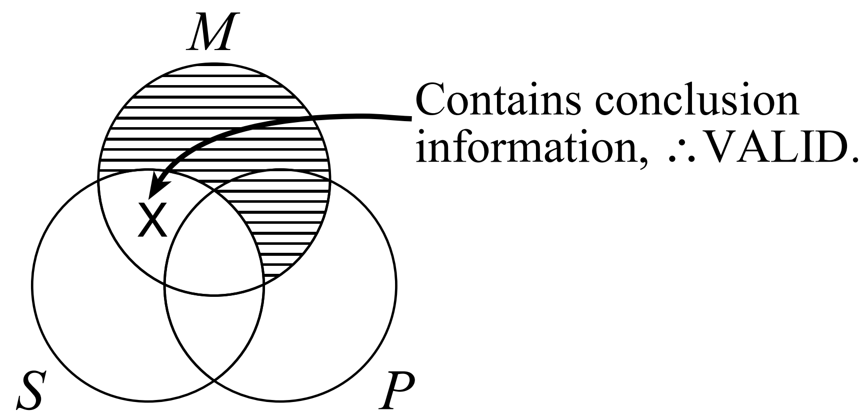


Syllogism in standard form

Venn Diagram of Premises

(7) Some M are not P.
All M are S.
$\therefore$ Some S are not P.

Mood–Figure: **OAO**–3

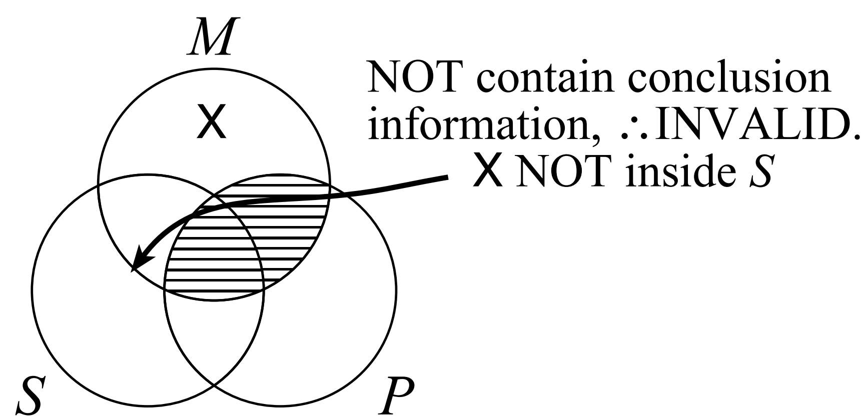


Syllogism in standard form

Venn Diagram of Premises

(8) No P are M.
Some M are not S.
$\therefore$ Some S are not P.

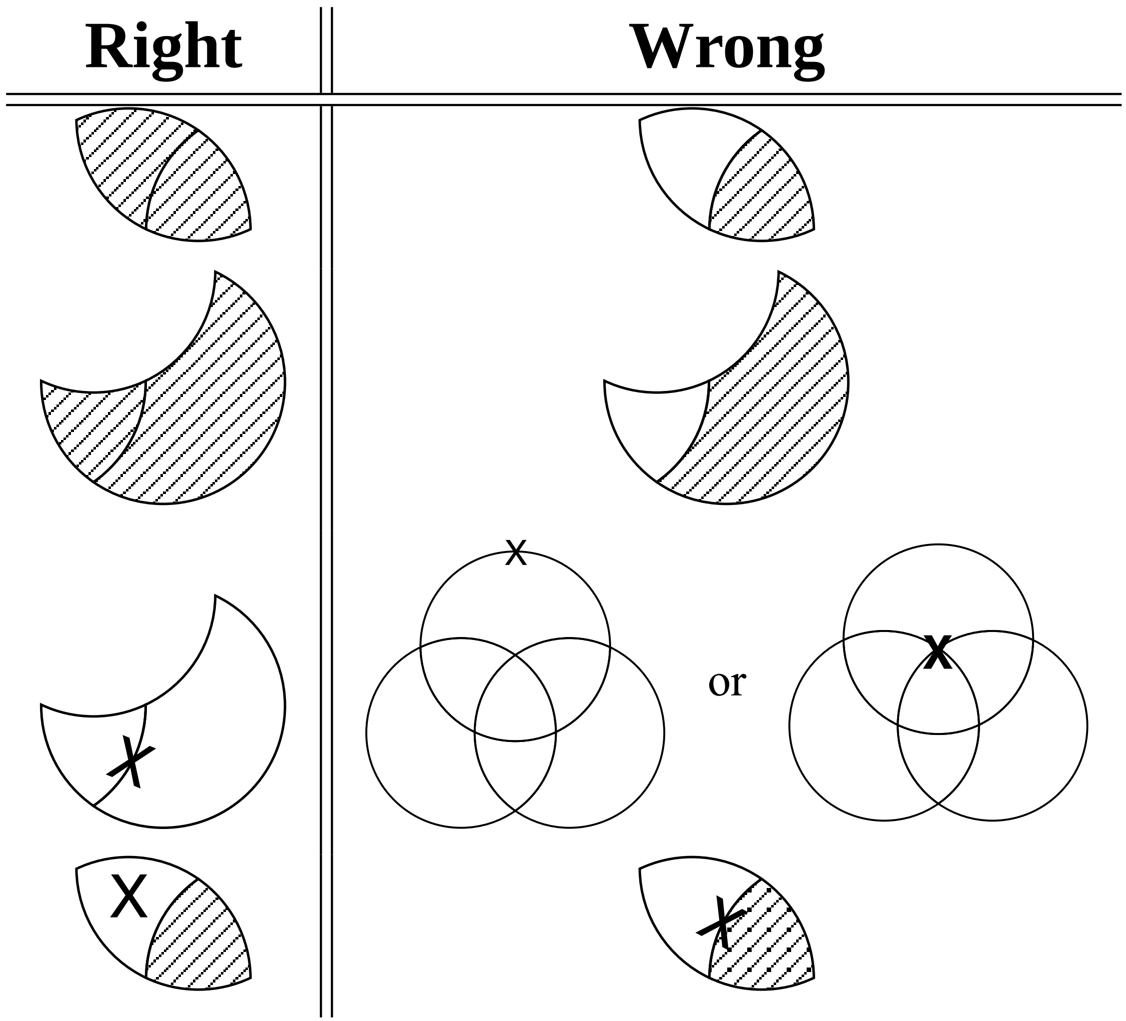
Mood–Figure: **EOO**–4



Chapter 5: Categorical Syllogisms & Venn Diagrams III

- 3-Circle Venn Diagram Rules and Tips
  1. Marks (shading, or placing an “X”) are entered only for the premises. No marks are made for the conclusion.
  2. If the argument contains one universal premise, then this premise should be entered first in the diagram. If there are two universal premises, either one can be done first.
  3. When entering the information contained in a premise, one should concentrate on the circles corresponding to the two terms in the statement. While the third circle cannot be ignored altogether, it should be given only minimal attention.
  4. When inspecting a completed diagram to see whether it supports a particular conclusion, one should remember that particular statements assert two things: “Some S are P” means “At least one S exists and that S is a P.
  5. When shading a region, one must be careful to shade *all* of the area in question.
  6. The region in which an “X” goes is initially always divided up into two parts. If one of these parts has been shaded, then the “X” goes in the other part of the region.

7. If neither of the two parts in a region is shaded, then the ‘X’ goes on the line separating the two parts of the region.



Chapter 5: Section 5.4 — Reducing the # of Terms

- Consider the following English syllogism:

  All photographers are non-writers.
  Some editors are writers.
  Therefore, some non-photographers are not non-editors.

- In symbolic form, this can be written as follows:

  All P are non-W.
  Some E are W.
  Therefore, some non-P are not non-E.

- This syllogism is *not* in standard form, since it has **6** terms, but it *can* be fixed.
- We need to *transform* the three statements in such a way that: (1) we do not change their meaning, and (2) we end-up with 3 terms in the syllogism.
- In fact, we can transform this syllogism into standard form in such a way that we use only the three terms P, W, and E. But, how? Recall one of our tables.

Chapter 5: Section 5.4 — Reducing the # of Terms, Cont'd

Proposition	Converse	Obverse	Contrapositive
(**A**) All A are B.	All B are A. ($\neq$)	No A are non-B. ($=$)	All non-B are non-A. ($=$)
(**E**) No A are B.	No B are A. ($=$)	All A are non-B. ($=$)	No non-B are non-A. ($\neq$)
(**I**) Some A are B.	Some B are A. ($=$)	Some A are not non-B. ($=$)	Some non-B are non-A. ($\neq$)
(**O**) Some A are not B.	Some B are not A. ($\neq$)	Some A are non-B. ($=$)	Some non-B are not non-A. ($=$)

- And, recall the syllogism we are trying to convert into standard form:

  All P are non-W.
  Some E are W.
  $\therefore$ Some non-P are not non-E.

- We need to transform the syllogism in such a way that: (1) we preserve the meaning of each claim, and (2) the syllogism only contains **3** terms.
- We also need the result to be in **standard form** (may require re-arranging premises). It's OK to have complements ("non-X"s) in the resulting syllogism.
- There may be *multiple* correct transformations! Here, there are at least two.

Chapter 5: Section 5.4 — Reducing the # of Terms, Cont'd

- Here are two correct transformations into standard form:

All P are non-W.		No P are W.
Some E are W.	$\mapsto$	Some E are W.
$\therefore$ Some non-P are not non-E.		$\therefore$ Some E are not P.
	or	
		Some W are not non-E.
	$\mapsto$	All W are non-P.
		$\therefore$ Some non-P are not non-E.

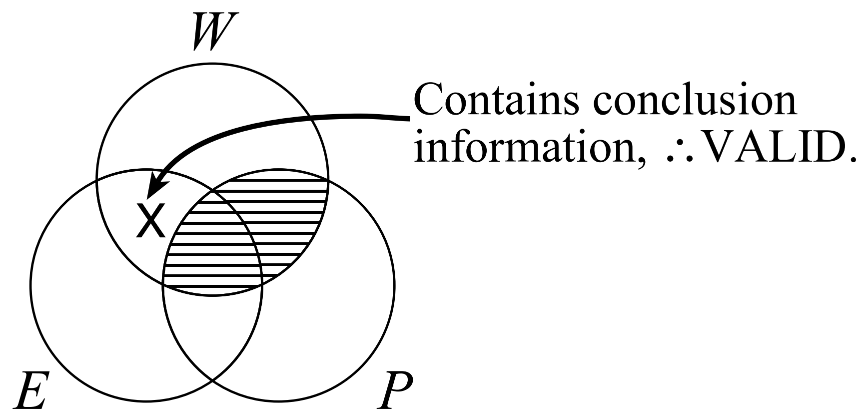
- In the 2nd case, we had to re-arrange the premises in order to get the syllogism into standard form. It's OK that we have "non-P" and "non-E" in the result.
- Let's do Venn Diagrams to check and see if these transformations are valid categorical syllogisms. They had better yield the same result!
- NOTE: No special technique is involved for doing 3-circle Venn Diagrams for syllogisms which contain complements ("non-X"s).

Syllogism in standard form

No P are W.
Some E are W.
$\therefore$ Some E are not P.

Mood–Figure: **EIO**–2

Venn Diagram of Premises



Syllogism in standard form

Some W are not non-E.
All W are non-P.
$\therefore$ Some non-P are not non-E.

Mood–Figure: **OAO**–3

Venn Diagram of Premises