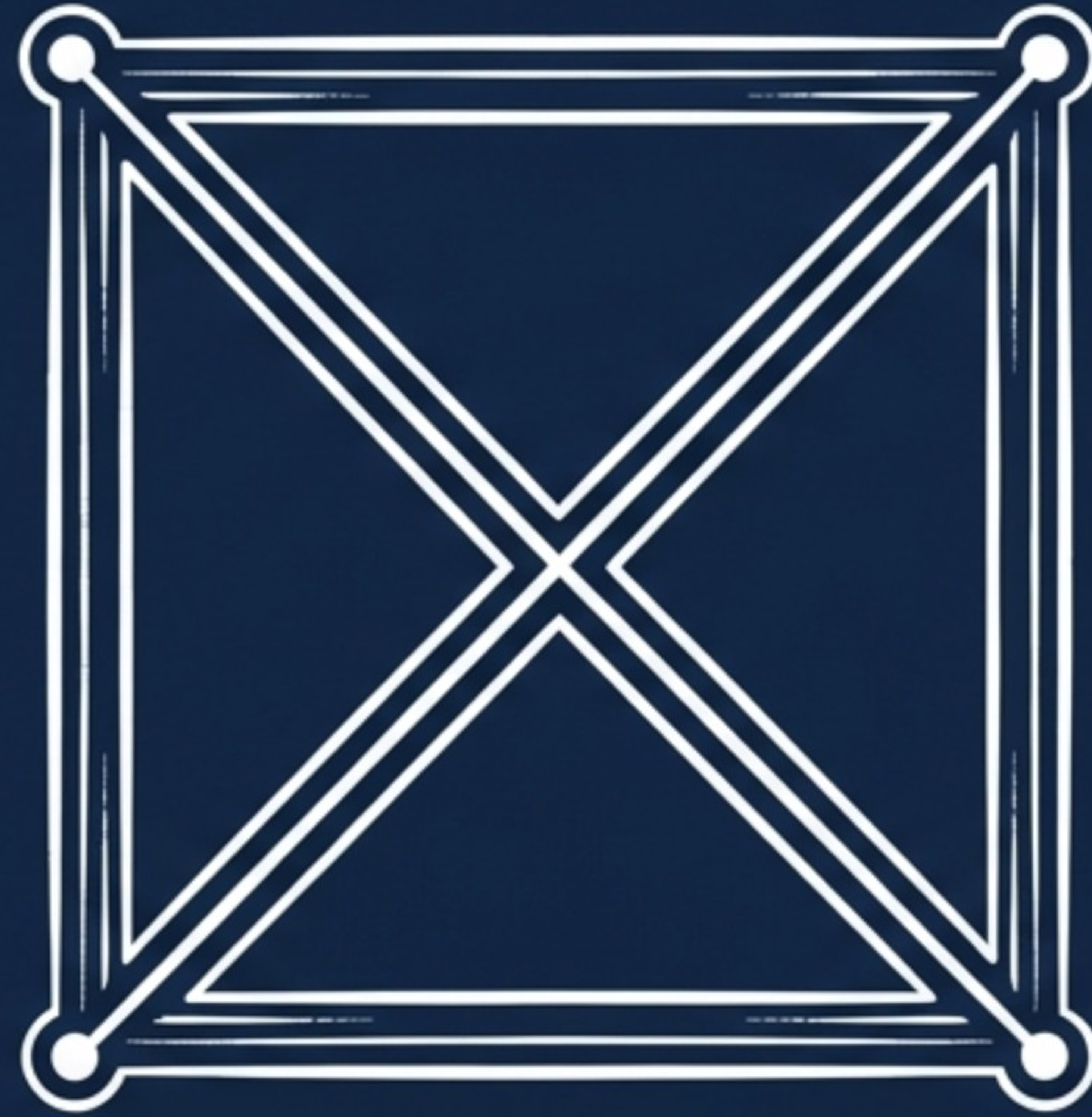




The Classical Square of Opposition

Foundations of Western Logic & Categorical Propositions

Defining the Logical Map



Purpose

A diagrammatic representation of logical relationships between four categorical propositions.



Function

Determines the Truth or Falsity of a statement based on the status of another.



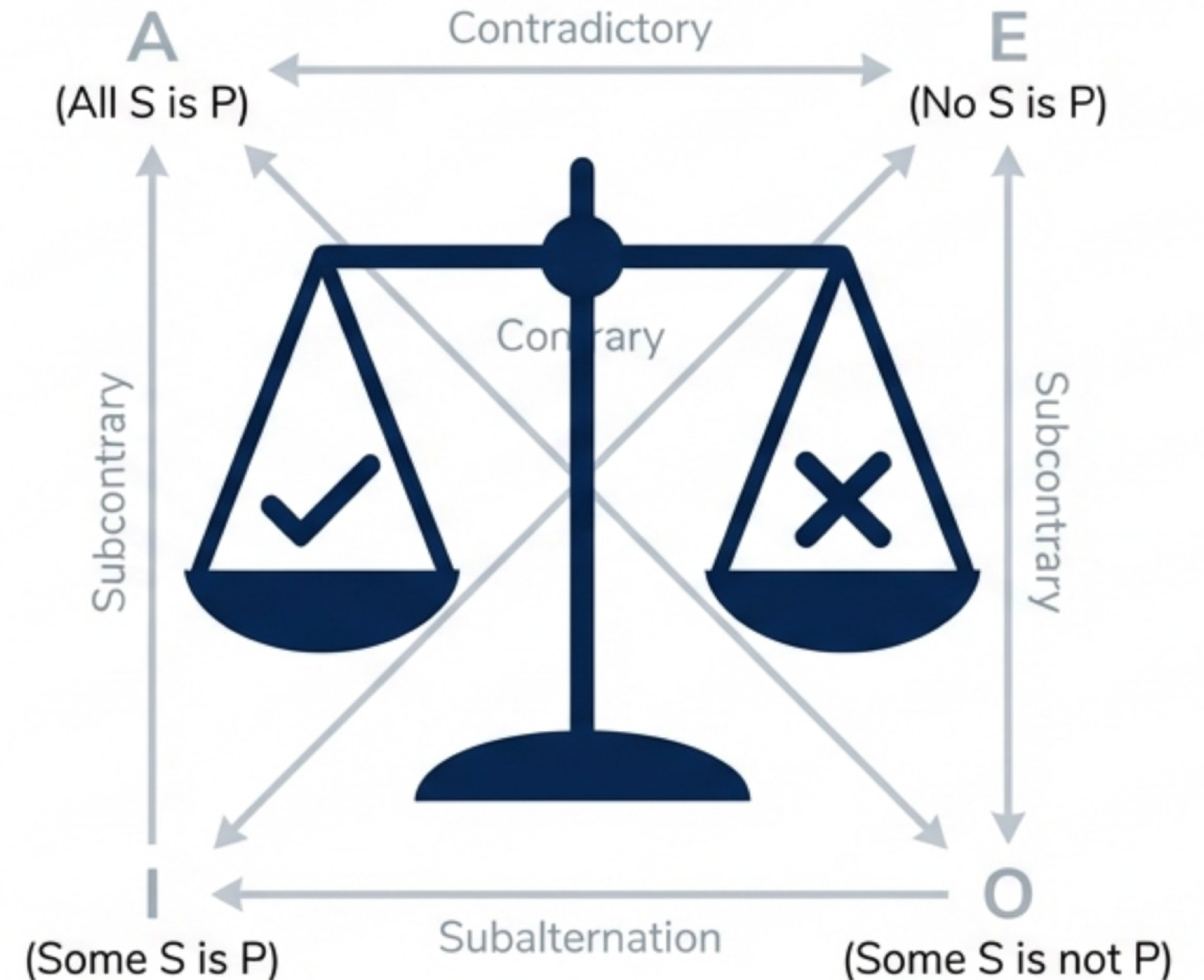
Application

The cornerstone of testing argument validity in deductive logic.



Rule of Four

The system revolves exclusively around four specific vowels: A, E, I, and O.

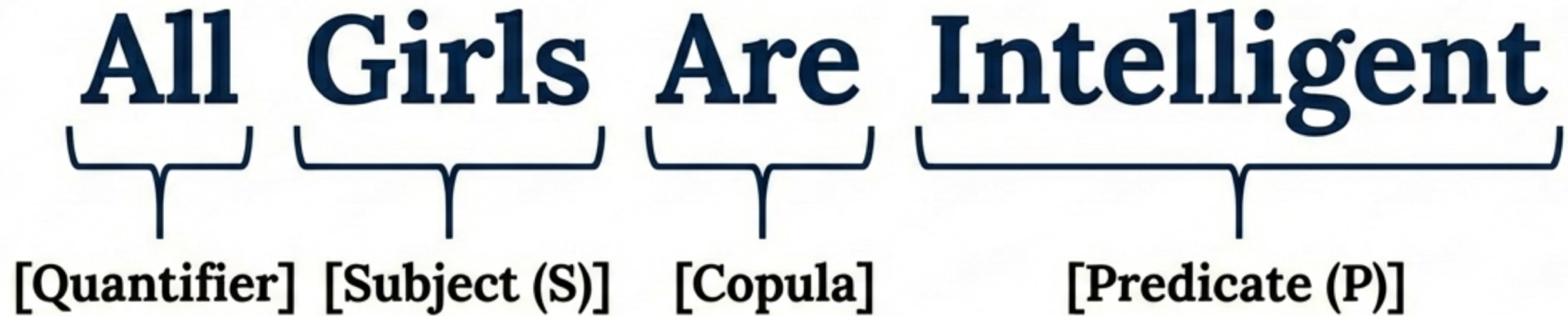


The Four Categorical Propositions

A All (Universal Affirmative)	E No / None (Universal Negative)
I Some (Particular Affirmative)	O Some Not (Particular Negative)

**Note: The vowel 'U' is never used in this system.*

Anatomy of a Proposition



Quantifier	Subject (S)	Copula	Predicate (P)
Specifies quantity (All, No, Some).	The main actor or topic.	The linking verb connecting Subject and Predicate.	The quality, action, or class affirmed or denied.

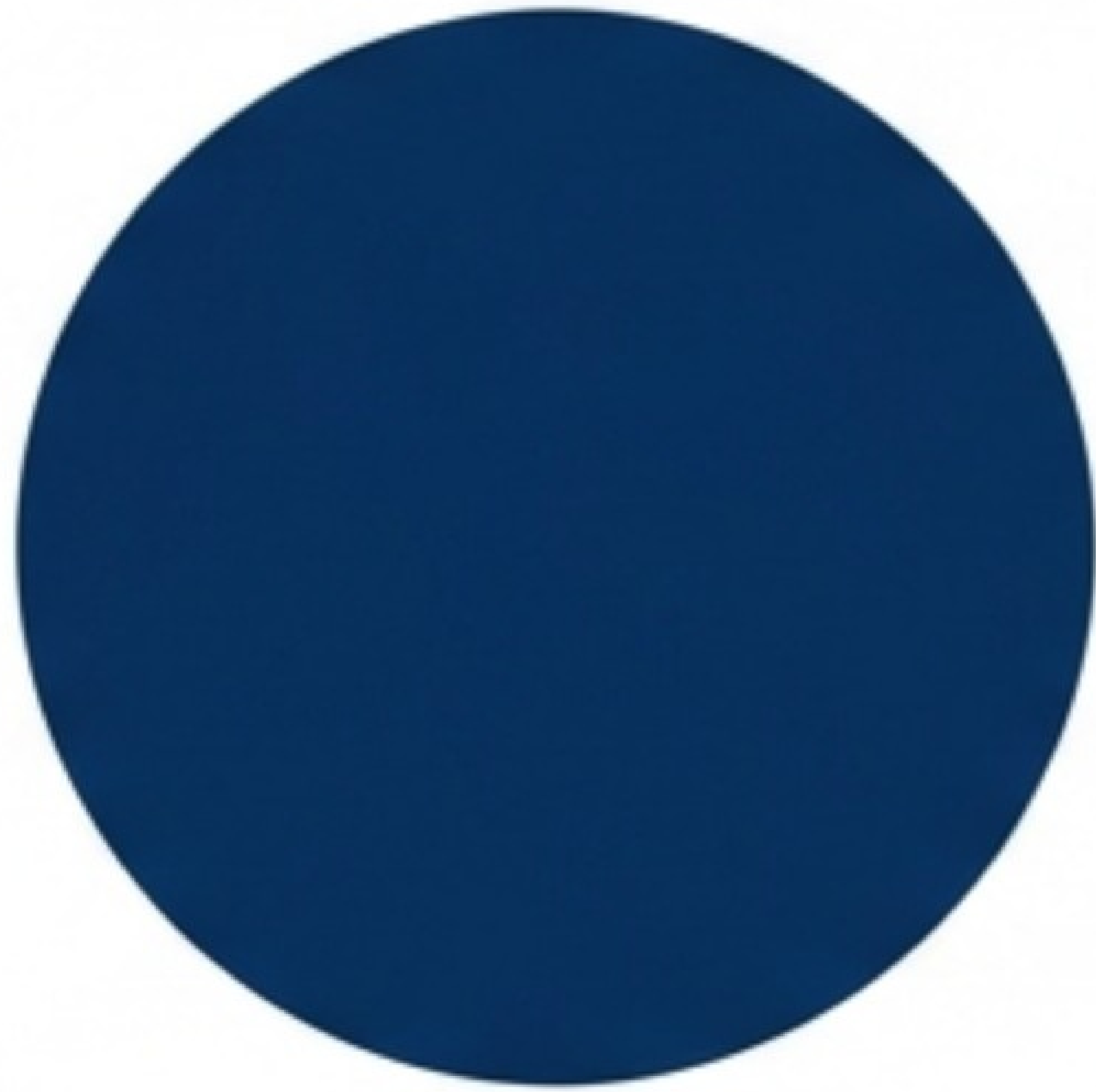
Classification: Quality vs. Quantity

	Affirmative (+)	Negative (-)
Universal	A (All S is P)	E (No S is P)
Particular	I (Some S is P)	O (Some S is not P)

Quantity: Does it cover the whole class (Universal) or a part (Particular)?

Quality: Is the statement positive (Affirmative) or does it deny something (Negative)?

Proposition A: Universal Affirmative



All Cats are Mammals.

- **Keyword:** All
- **Logic:** Includes 100% of the Subject in the Predicate.
- **Distribution Rule:** Subject is Distributed. (Refers to *All* Cats).
- **Predicate Status:** Undistributed. (We are not referring to *All* Mammals).

Proposition E: Universal Negative



No Dogs are Cats.

- **Keyword:** No / None
- **Logic:** Excludes 100% of the Subject from the Predicate.
- **Distribution Rule:** Both Subject and Predicate are Distributed.
- **Reasoning:** We know 100% of Dogs are not Cats, and 100% of Cats are not Dogs.

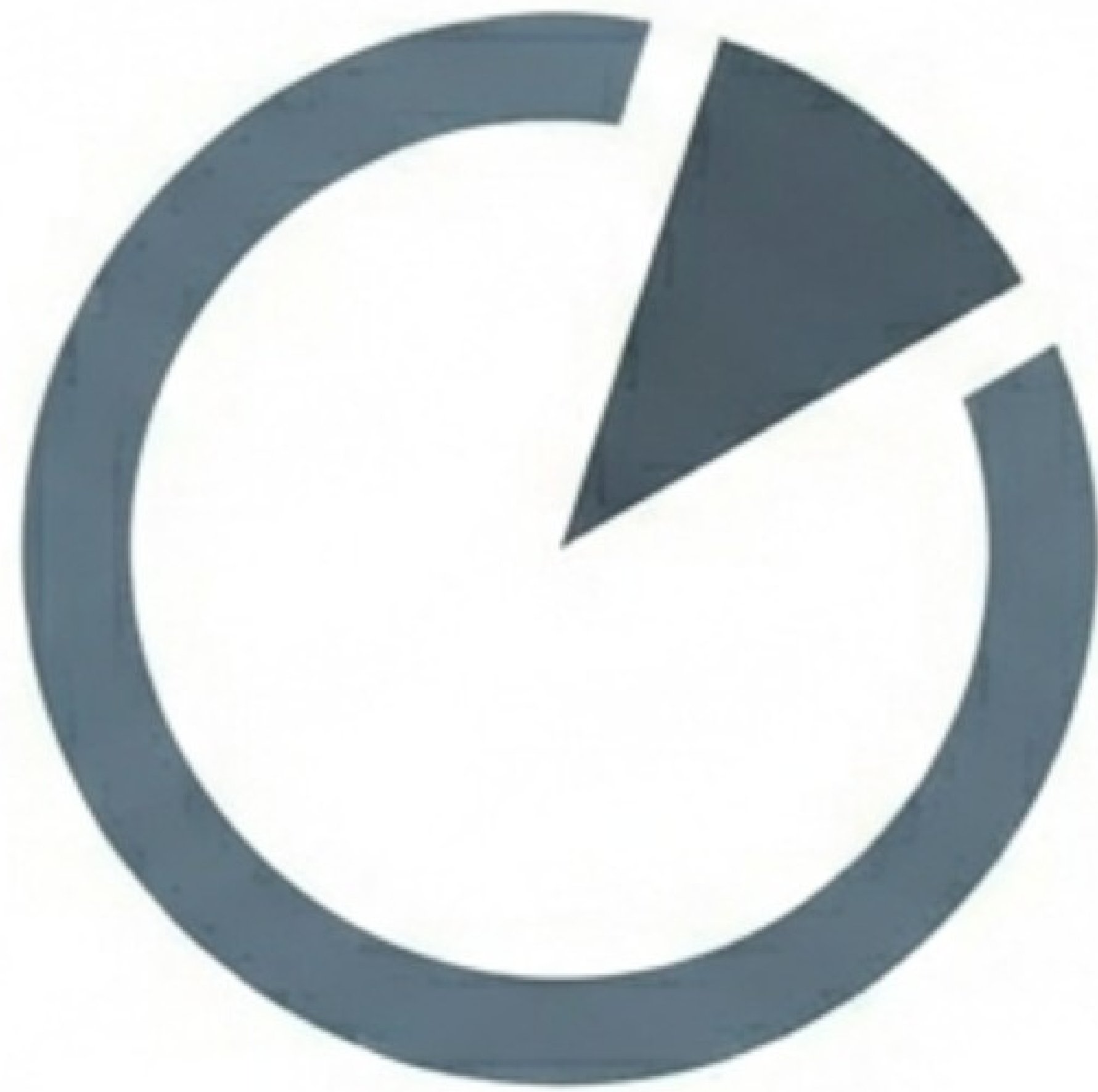
Proposition I: Particular Affirmative



Some Boys are Cute.

- **Keyword:** Some
- **Logic:** Refers to at least one member or a part of the class.
- **Distribution Rule:** Neither Term is Distributed.
- **Reasoning:** We do not know about *All* Boys, nor do we know about *All* Cute things.

Proposition O: Particular Negative



Some Cats are Not Black.

- **Keyword:** Some Not
- **Logic:** Denies the quality for a specific part of the class.
- **Distribution Rule:** Predicate is Distributed.
- **Reasoning:** The Subject is Particular (Undistributed), but the Predicate is excluded in its entirety from that specific group.

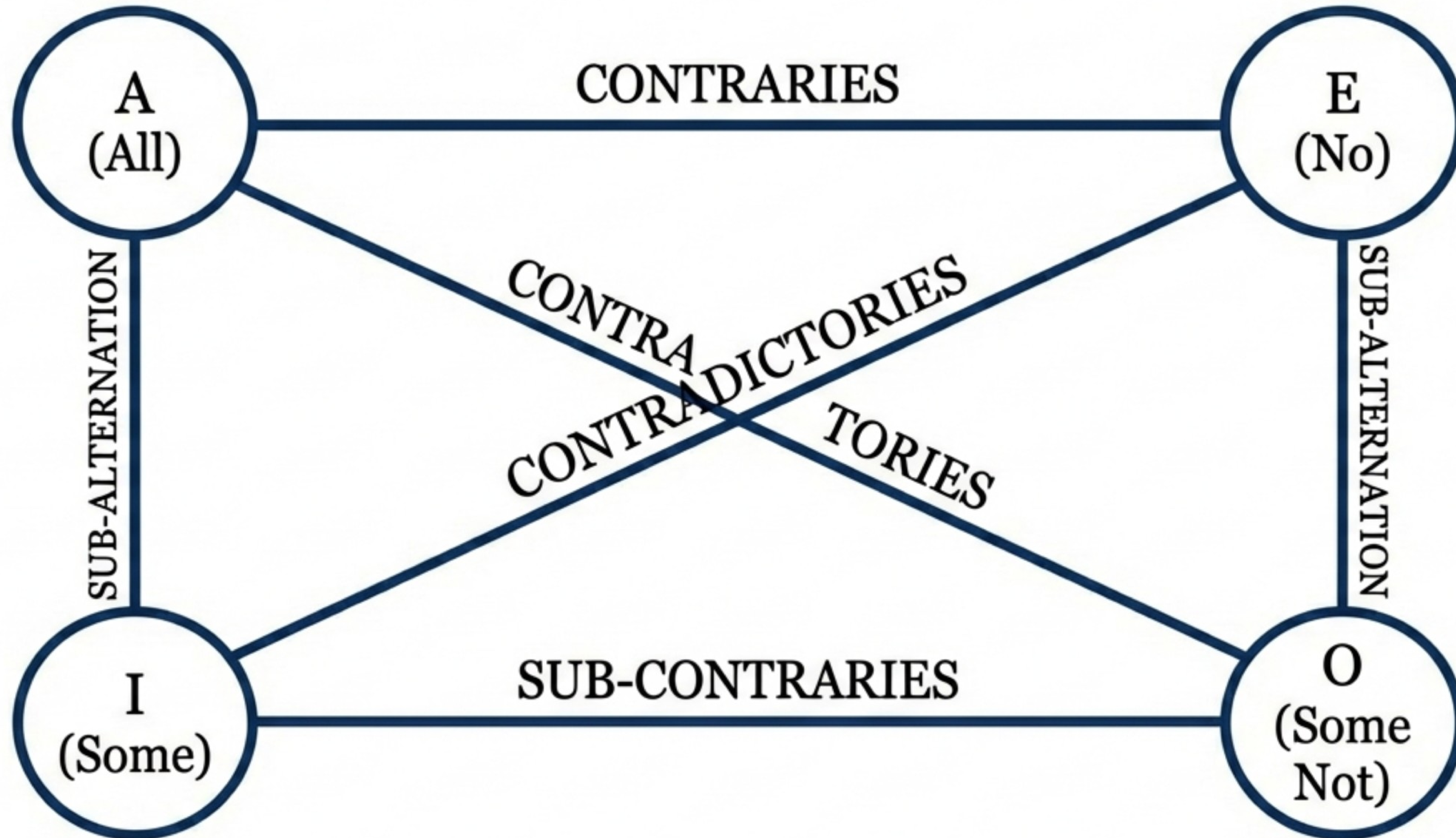
The Logic of Distribution

- **Distributed:** Covers 100% of the class. The term is independent and complete.
- **Undistributed:** Covers less than 100%. The term relies on the other or is incomplete.

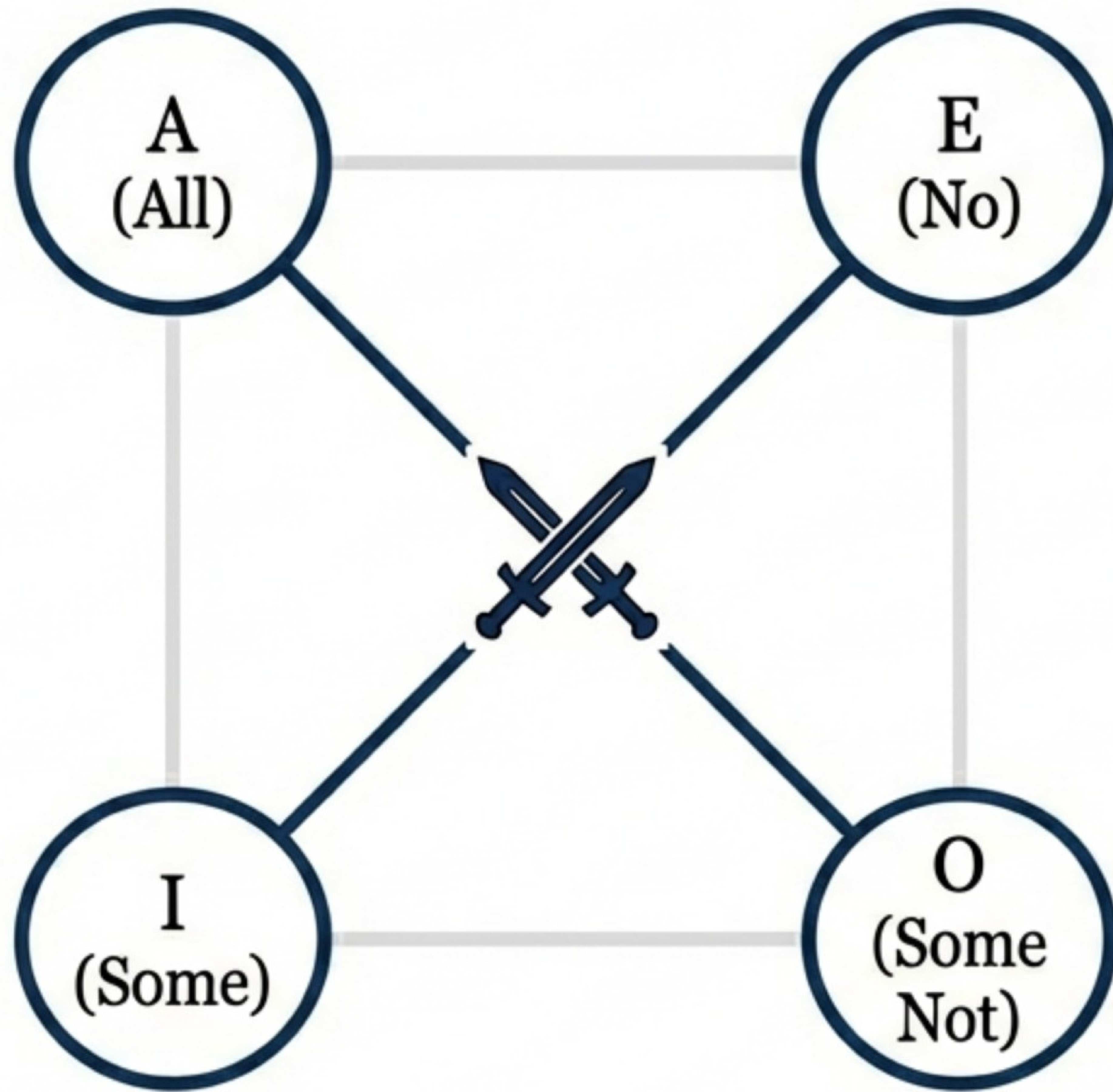
Proposition Type	Subject	Predicate
Universal Affirmative (A)	Distributed	Undistributed
Universal Negative (E)	Distributed	Distributed
Particular Affirmative (I)	Undistributed	Undistributed
Particular Negative (O)	Undistributed	Distributed

Rule of Thumb: Universals (A, E) always distribute the Subject.
Negatives (E, O) always distribute the Predicate.

The Square of Opposition



Contradictories (The Diagonals)



Relationship: Connects $A \leftrightarrow O$ and $E \leftrightarrow I$.

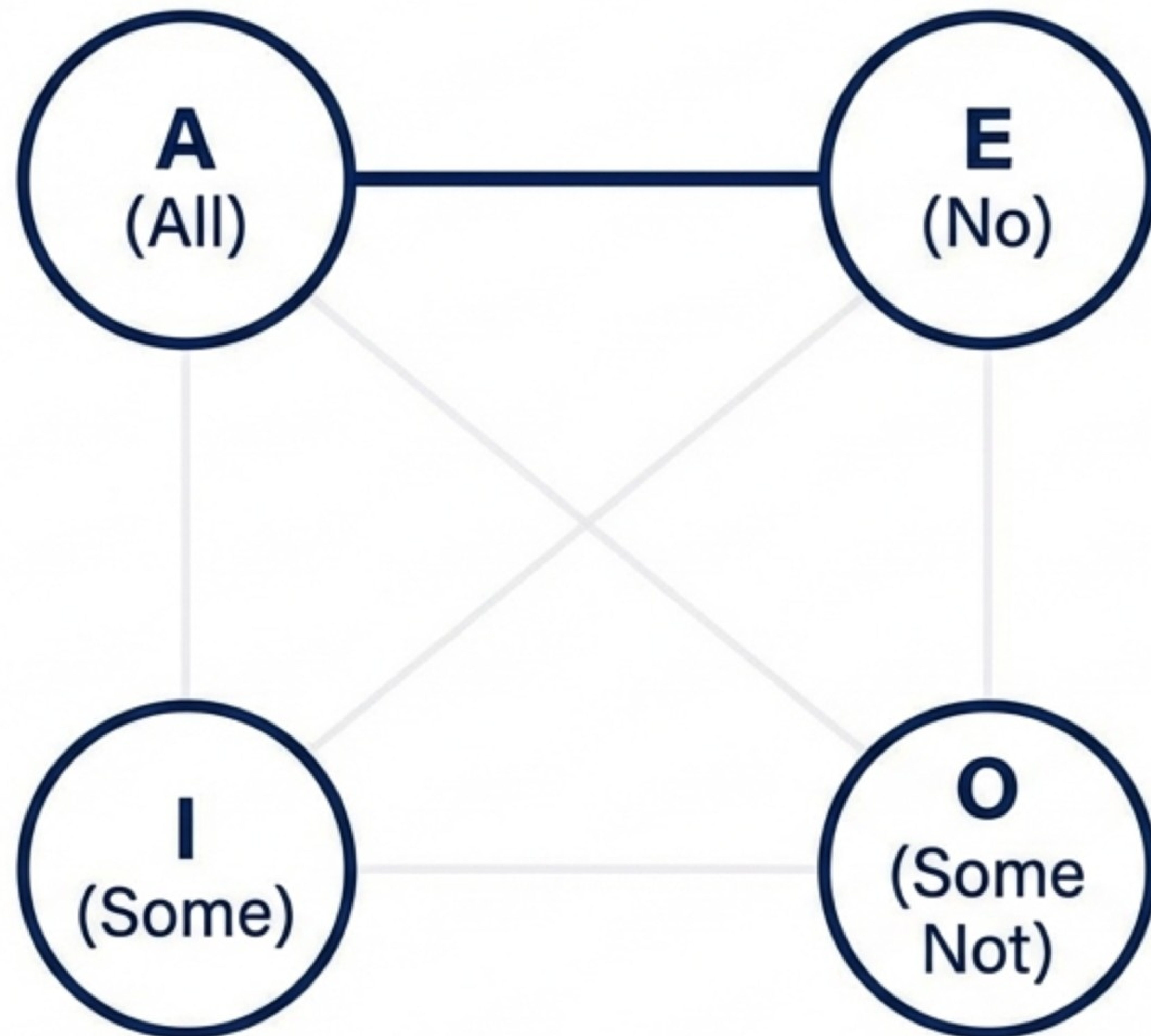
The Rule: Complete Opposites.

- They cannot both be True.
- They cannot both be False.

Implication:

If one is True, the other is definitely False.
If one is False, the other is definitely True.

Contraries (The Top Line)



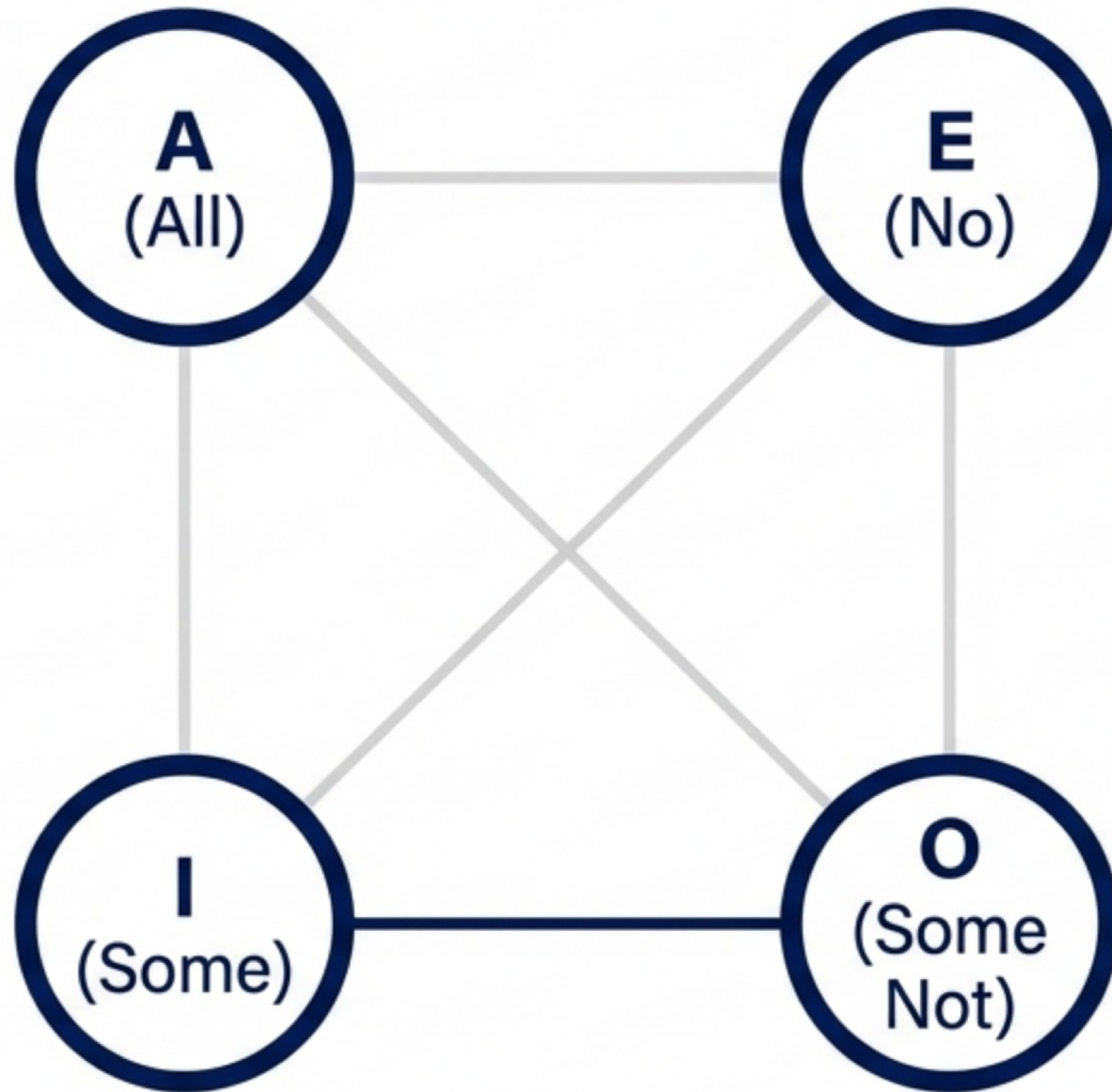
Relationship: Connects $A \leftrightarrow E$ (Universals).

The Rule: Mutual Exclusivity.

- They cannot both be True.
- But they **can** both be False.

The 'Doubtful' Zone: If one is False, the other is **Undetermined/Doubtful** (because the truth might lie in the Particulars).

Sub-Contraries (The Bottom Line)

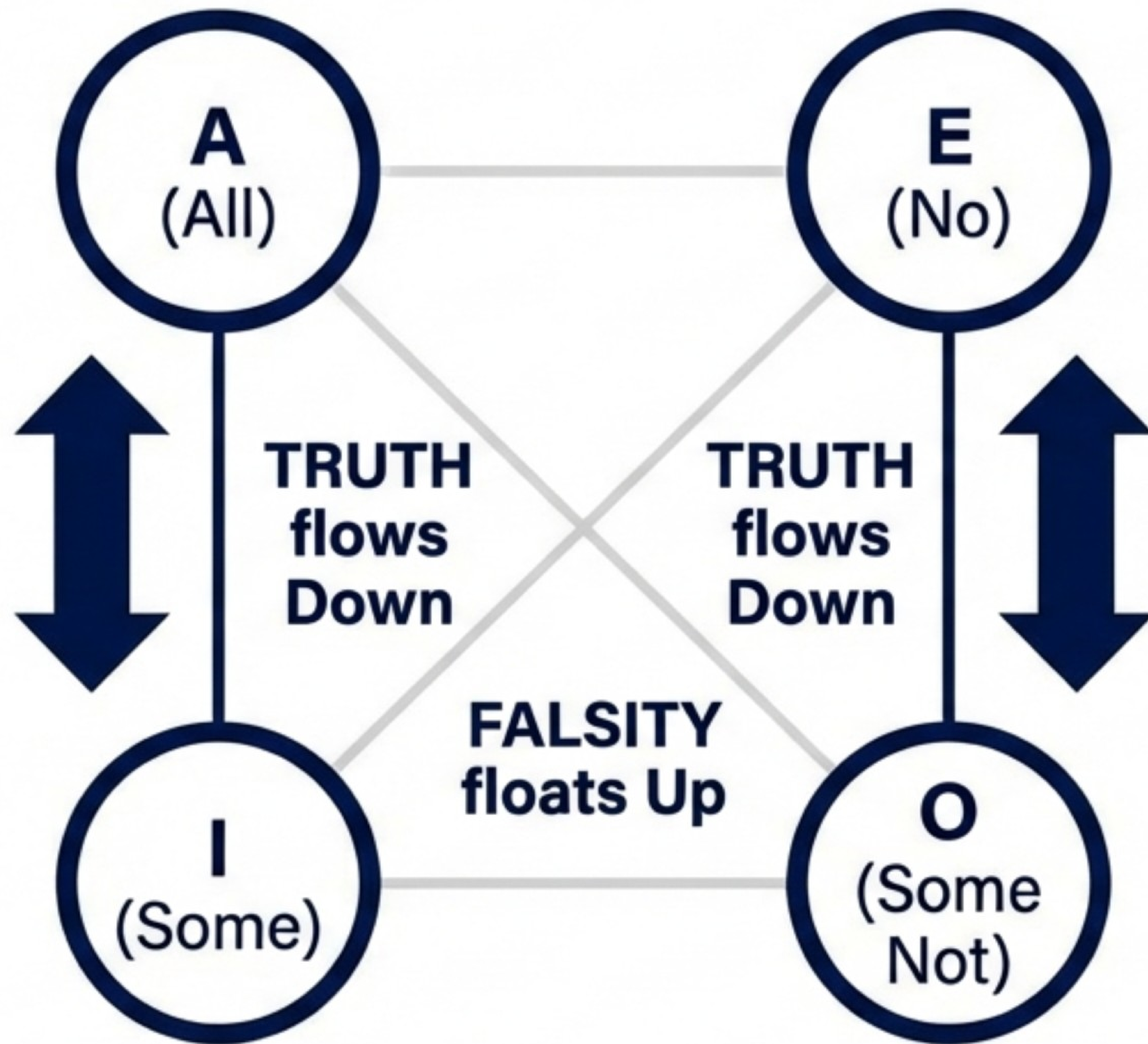


Relationship: Connects $I \leftrightarrow O$ (Particulars).

The Rule: The Inverse of Contraries.
- They cannot both be False.
- But they **can** both be True.

Implication:
If one is False, the other is definitely True.
If one is True, the other is **Doubtful**.

Sub-Alternation (The Flow of Truth)



Relationship: Connects $A \leftrightarrow I$ and $E \leftrightarrow O$.

Rule of Truth (Down):

If the Universal (A/E) is True, the Particular (I/O) is **Definitely True**.

Rule of Falsity (Up):

If the Particular (I/O) is False, the Universal (A/E) is **Definitely False**.

Interchangeability of Terms (Conversion)

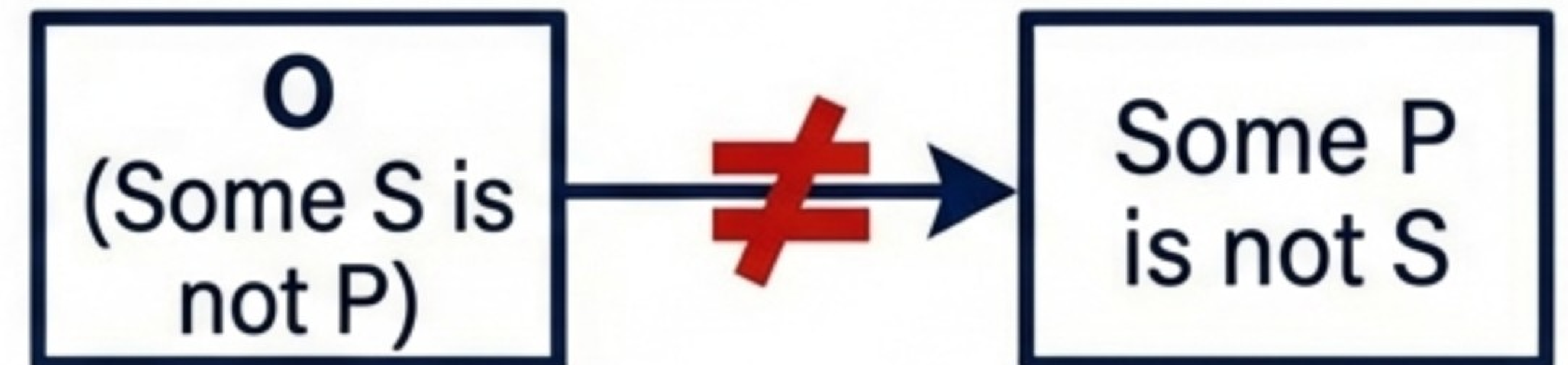
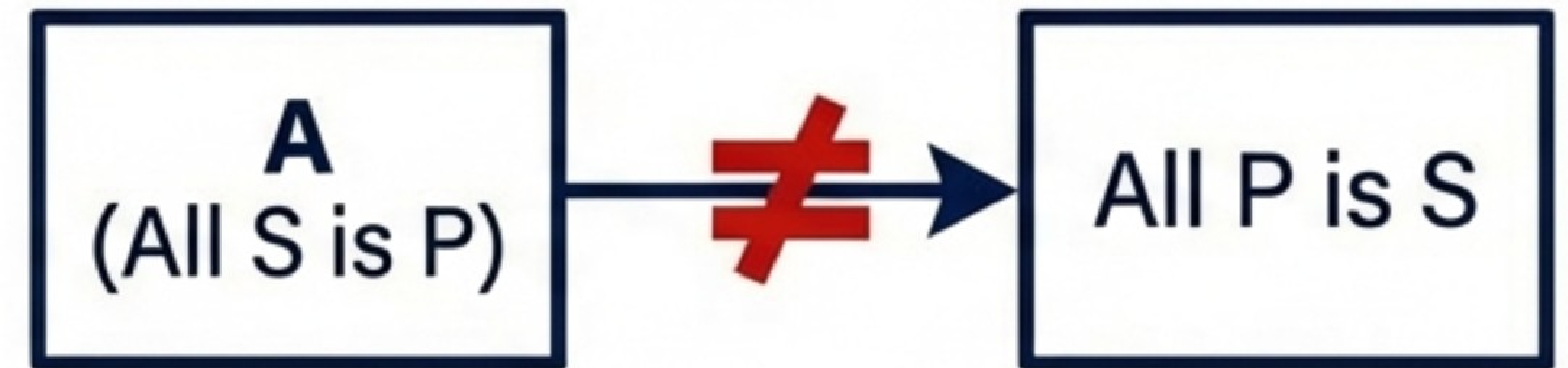
Can we swap the Subject and Predicate without changing the truth?



Valid Swaps



Invalid Swaps



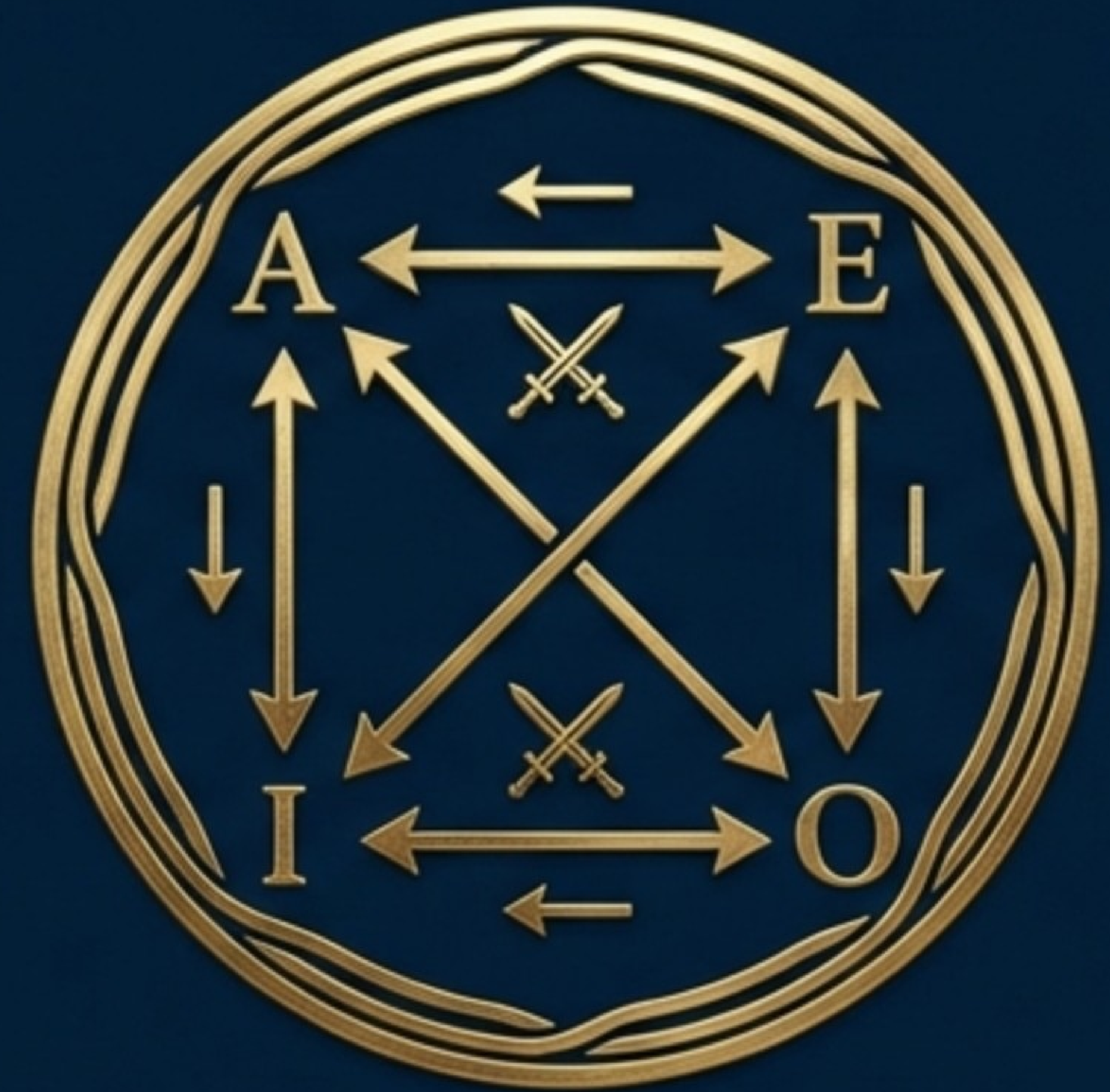
Master Summary: Determination of Truth

If Statement Is...	Then A is...	Then E is...	Then I is...	Then O is...
A is True	True	False	True	False
E is True	False	True	False	True
I is True	Doubtful	False	True	Doubtful
O is True	False	Doubtful	Doubtful	True

Key Takeaway: If a **Universal** is true, everything else is determined.
If a **Particular** is true, the Universals are doubtful.

Rules of Engagement

1. **Draw the Square:** Sketch A-E-I-O before solving.
2. **Identify the Line:** Is it Diagonal (Contradictory), Horizontal, or Vertical?
3. **Apply the Flow:** Truth flows Down; Falsity flows Up.
4. **Check the Swords:** Diagonals never agree.



Logic is hierarchical. Understanding the components allows you to predict the structure.