

Logic Notes #7

Aristotelian Logic: Opposition & Conversion

a. Opposition—Propositions containing the same subject & predicate but opposed on the basis of difference in quantity or quality

Opposition—relation among propositions with the same subject and predicate but different quality

Kinds of Opposition

1) contradictory opposition

Placement on the Square	the logical relation between propositions with the same S&P but with opposite quantity and quality	
Rule of Inference	Contradictory propositions have opposite truth value.	
Cases	A & O; E & I	
Examples	All horses are hoofed. □	It's false that some horses aren't hoofed.
	No horses are fish. □	It's false that some horses are fish.
	Some horses are black. □	It's false that no horses are black.
	Some horses aren't black. □	It's false that all horses are black.

2) contrary opposition

Placement on the Square	the logical relation between universal propositions with the same S&P but with opposite <i>quality</i>	
Rule of Inference	The truth of a universal proposition guarantees the falsity of its contrary (i.e., they can't both be true).	
Cases	A & E	
Examples	All horses are hoofed. □	It's false that no horses are hoofed.
	No horses are fish. □	It's false that all horses are fish.

Other Relations based on difference of quantity and quality

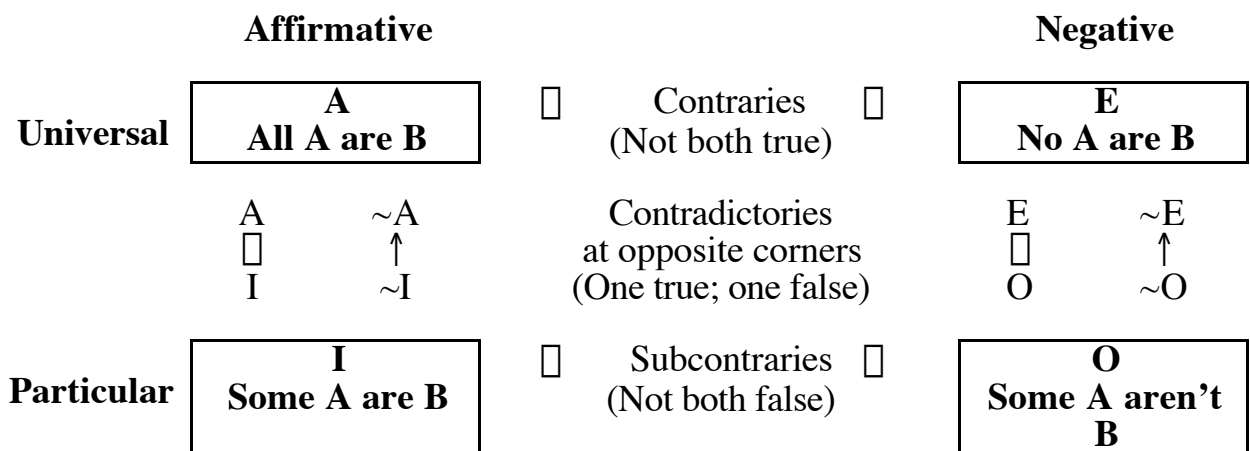
1) subcontrary propositions (not strictly opposed)

Placement on the Square	the logical relation between particular propositions with the same S&P but with opposite <i>quality</i>	
Rule of Inference	The falsity of a particular proposition guarantees the truth of its subcontrary (i.e., they can't both be false).	
Cases	I & O	
Examples	It's false that some horses are horned. □	Some horses are not horned.
	It's false that some horses are not warm-blooded. □	Some horses are warm-blooded.

2) Subalternation

Placement on the Square	the logical relation between universal and particular propositions with the same S&P and of the same quantity	
Rules of Inference	Weakening: The truth of a universal proposition guarantees the truth of the corresponding particular. Counterexample: The falsity of a particular proposition guarantees the falsity of the corresponding universal.	
Cases	A & I; E & O	
Examples	All horses are mammals. □	Some horses are mammals.
	No horses are fish. □	Some horses are not fish.
	It's false that some horses have wings. □	It's false that all horses have wings.
	It's false that some horses are not mammals. □	It's false that no horses are mammals.

Summary (The Square of Opposition)



b. Conversion—Propositions containing the same terms but not in the same place

conversion

definition—the simple converse of a proposition is a proposition of the same quantity and quality as the original but with the subject and the predicate reversed

examples

“All horses are large hoofed mammals having a short-haired coat, a long mane, and a long tail.”	“All large hoofed mammals having a short-haired coat, a long mane, and a long tail are horses.”
“Some horses are stallions.”	“Some stallions are horses.”
“Some horses are not black.”	“Some black animals aren’t horses.”
“No horses are persons.”	“No persons are horses.”

validity

the simple converse of a true E or I proposition is always true

explanation

E is the relation of complete separation; when one says two classes are completely separate, it doesn’t matter which one is named first

I is the relation of overlap; when one says two classes overlap, it doesn’t matter which one is named first

the simple converse of an A or an O proposition *may* be true, but the truth of the converse is not guaranteed

explanation

A is the relation of inclusion; when one says one class is included in another, it does matter which one is said to be included in which

O is the relation of (at least partial) exclusion; when one says one class is partially excluded from the other, it does matter which is partially excluded from which

therefore, the simple conversion of such propositions is *invalid*

two further notes on A-propositions

good definitions are convertible

since in good definitions, the subject and predicate are co-extensive
e.g., “all triangles are figures with three straight sides”

because it is a definition implies

“all figures with three straight sides are triangles”

since A-propositions imply the corresponding I-propositions and I-propositions are convertible, $Asp \square Isp \square Ips$

so Ips is sometimes taken as the converse of Asp

not simply, but *per accidens*, by limitation, or after weakening
e.g., “all mammals are warm-blooded”

does not imply “all warm-blooded [animals] are mammals”

but does imply “some warm-blooded [animals] are mammals”