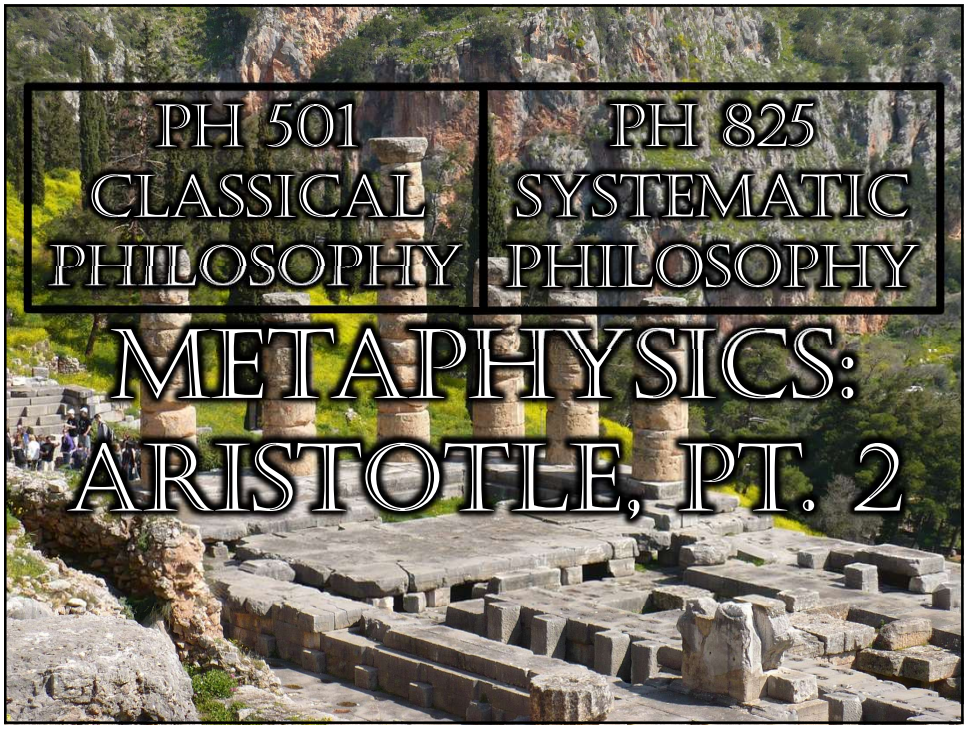
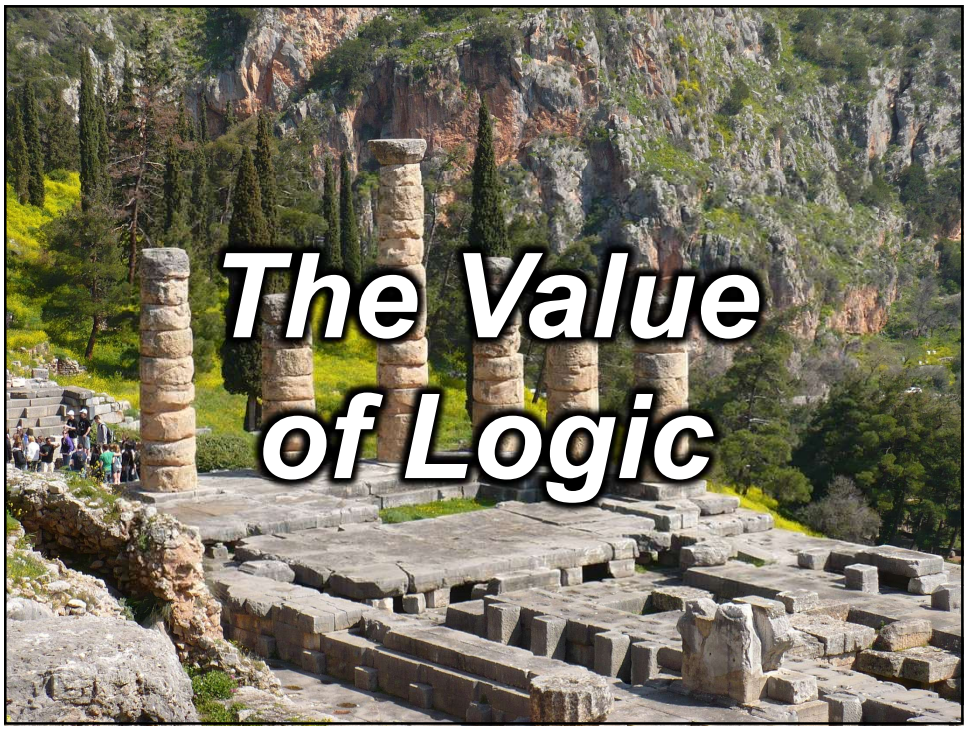
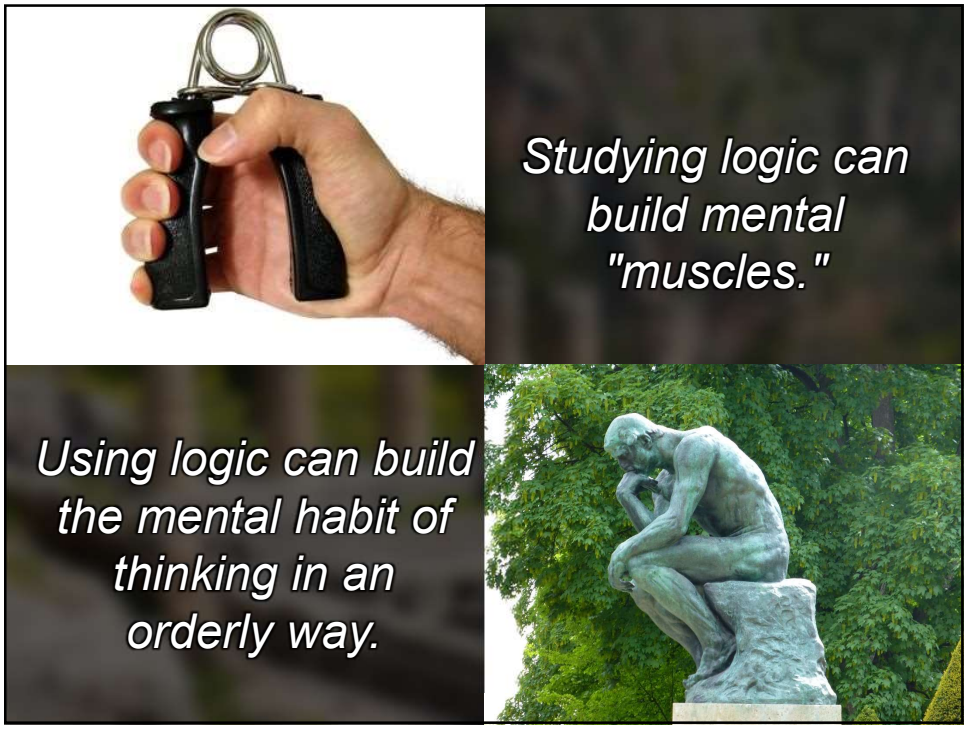

PH 501
CLASSICAL
PHILOSOPHY
PH 825
SYSTEMATIC
PHILOSOPHY
METAPHYSICS:
ARISTOTLE, PT. 2

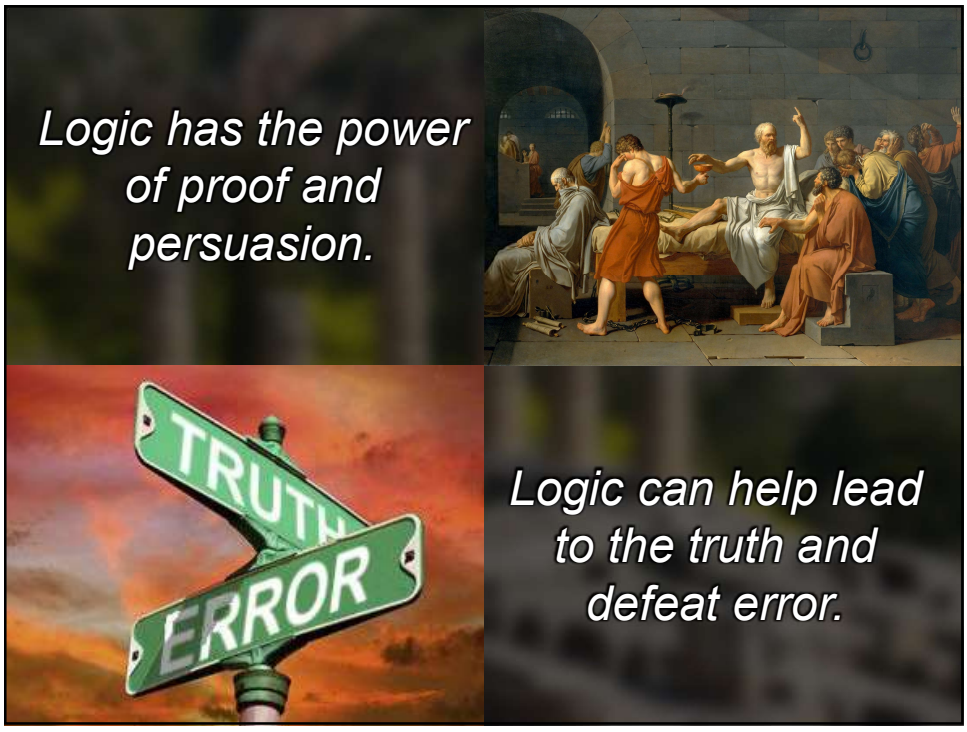
1


The Value
of Logic

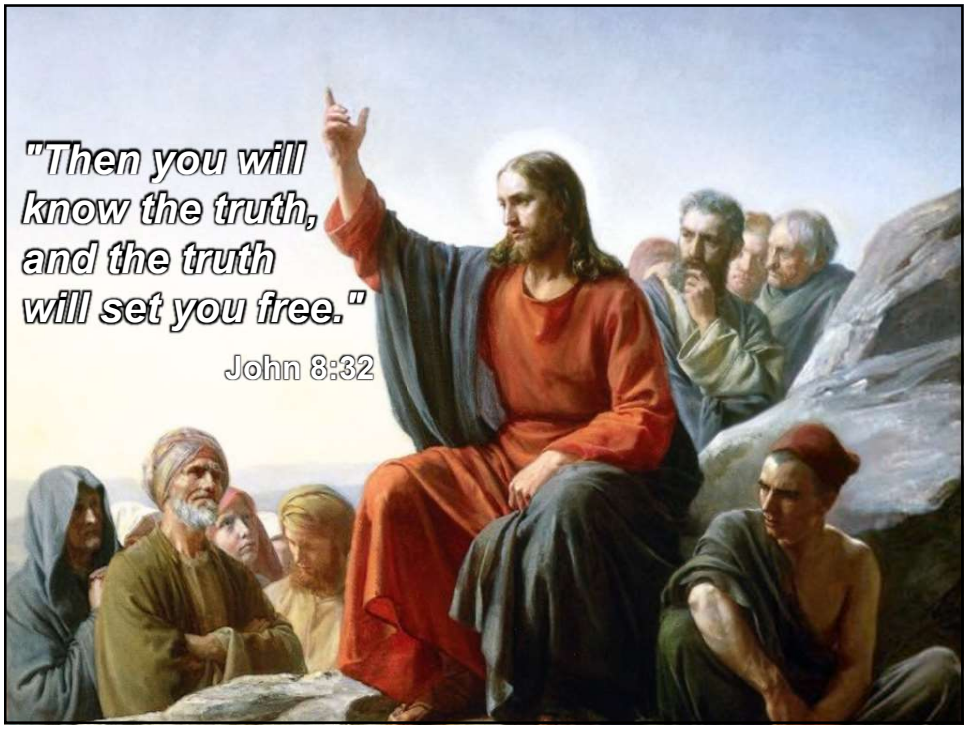
2


Studying logic can build mental "muscles."
Using logic can build the mental habit of thinking in an orderly way.

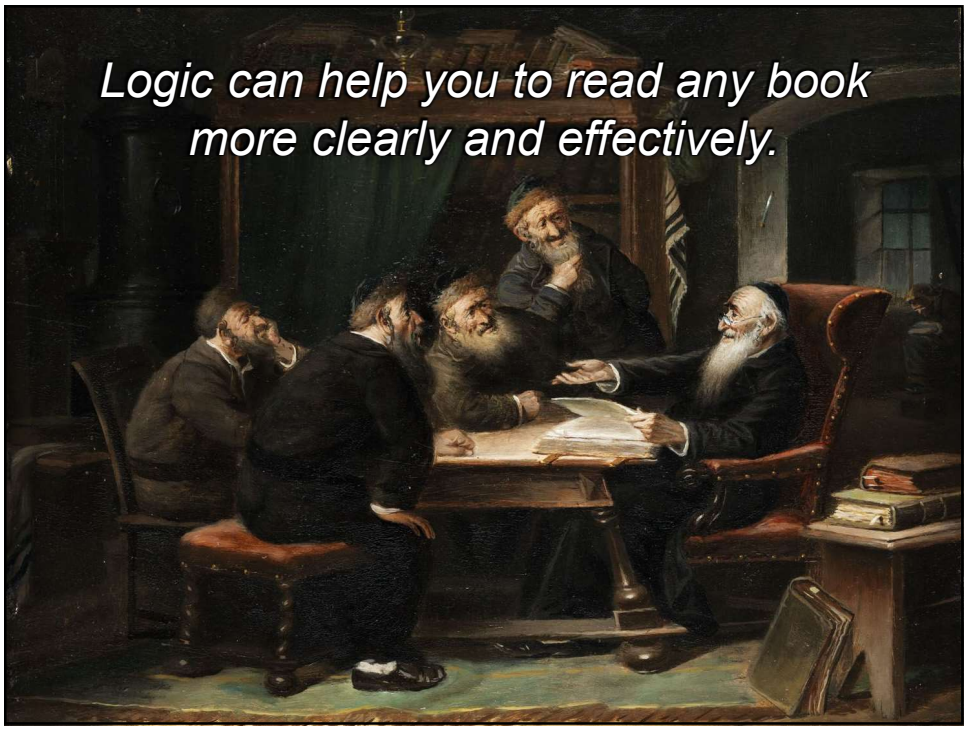
3


Logic has the power of proof and persuasion.
TRUTH
ERROR
Logic can help lead to the truth and defeat error.

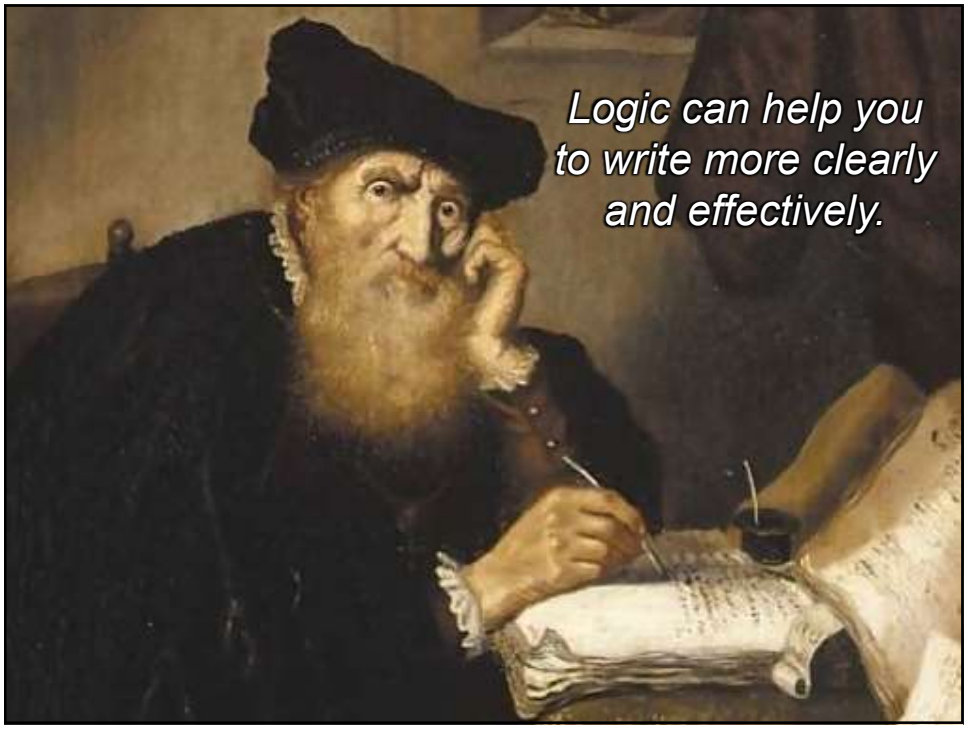
4


"Then you will
know the truth,
and the truth
will set you free."
John 8:32

5

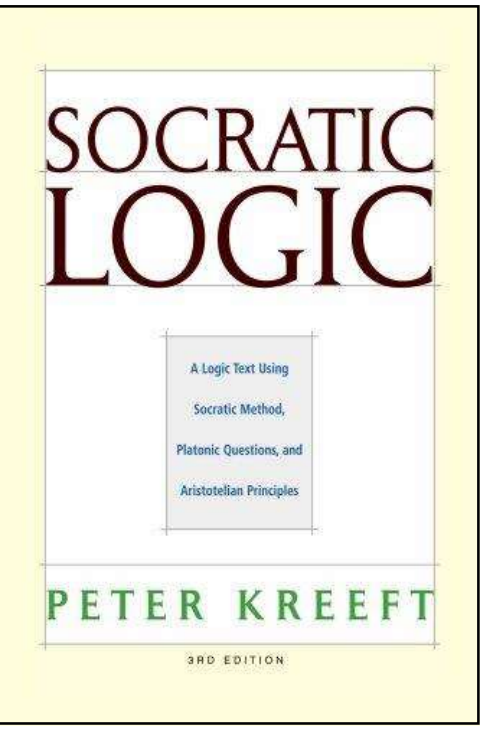

Logic can help you to read any book
more clearly and effectively.

6

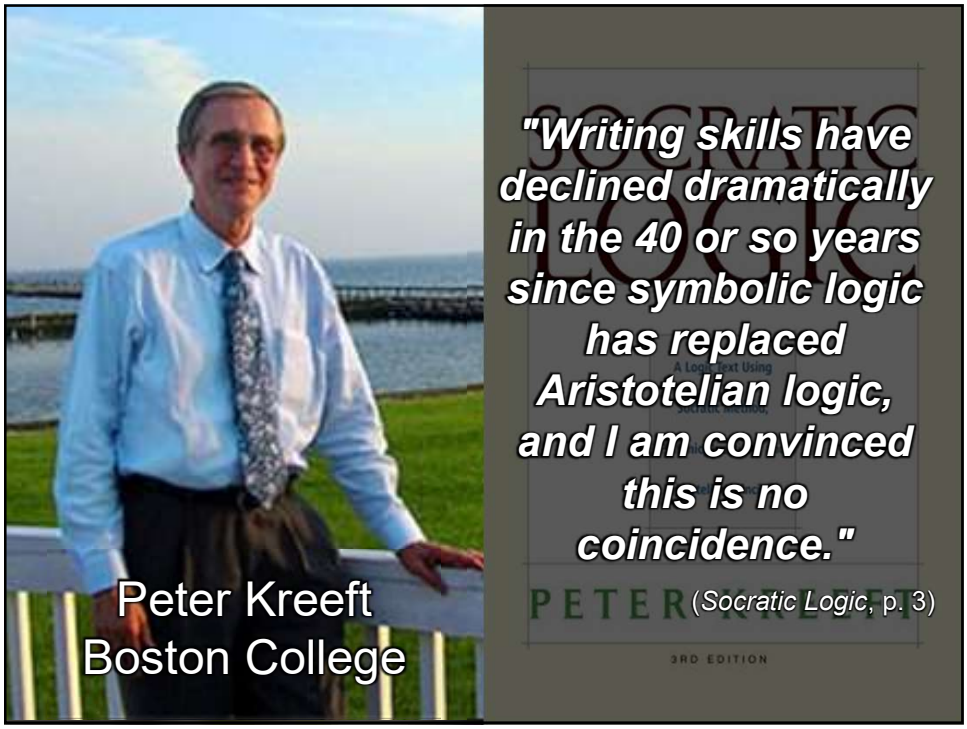

Logic can help you
to write more clearly
and effectively.

7

Peter Kreeft
Boston College


SOCRATIC
LOGIC
A Logic Text Using
Socratic Method,
Platonic Questions, and
Aristotelian Principles
PETER KREEFT
3RD EDITION

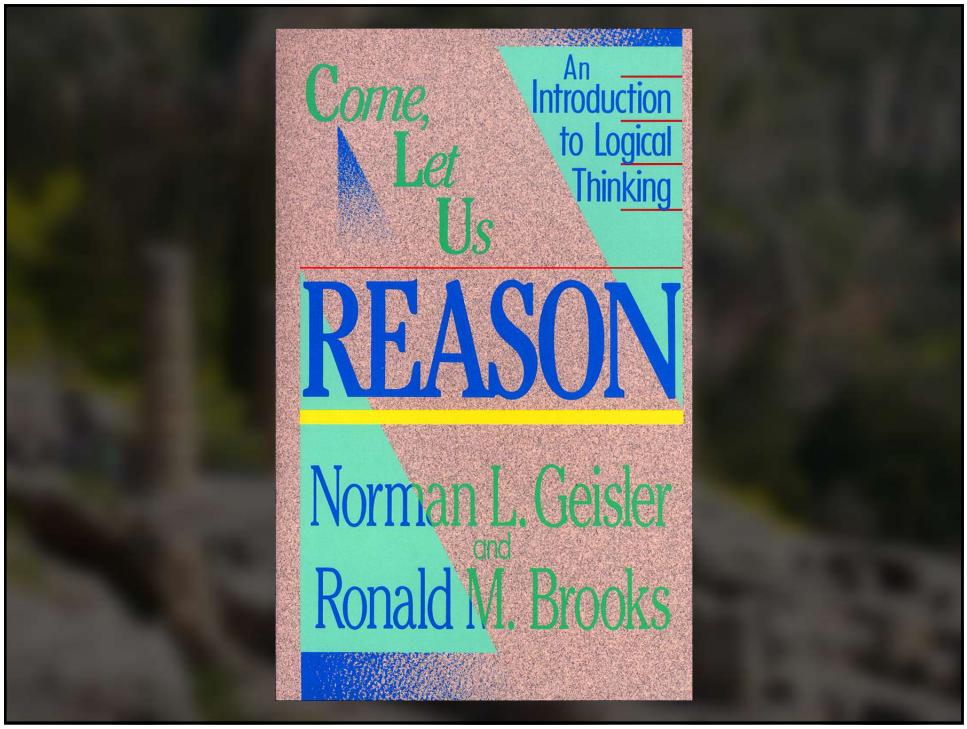
8


Peter Kreeft
Boston College
"Writing skills have declined dramatically in the 40 or so years since symbolic logic has replaced Aristotelian logic, and I am convinced this is no coincidence."
(Socratic Logic, p. 3)

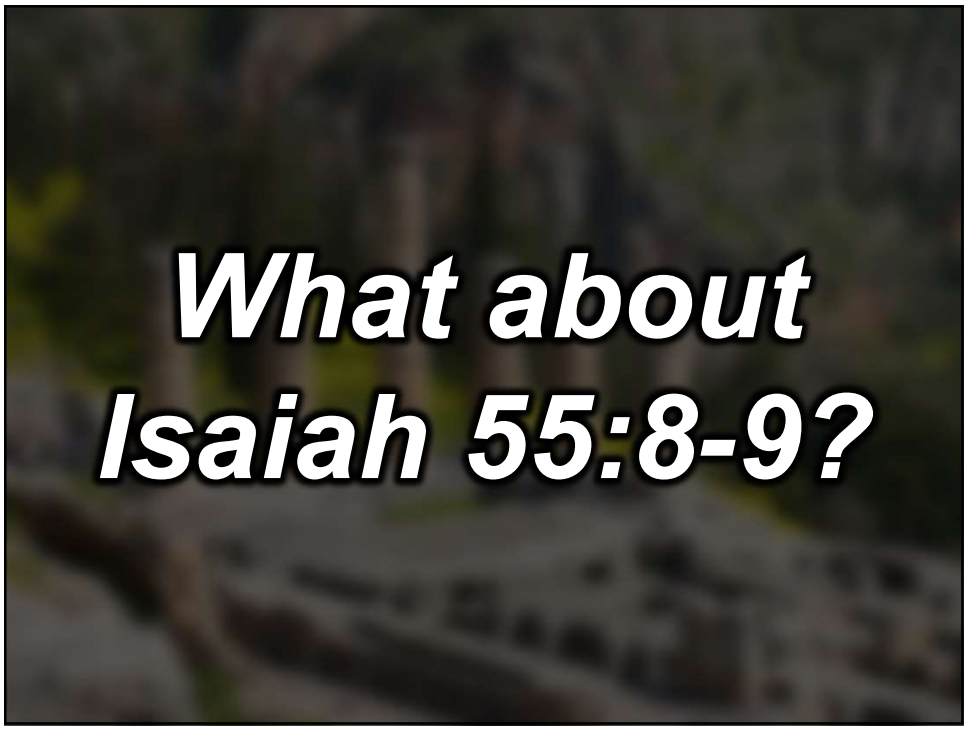
9

Objections to Logic

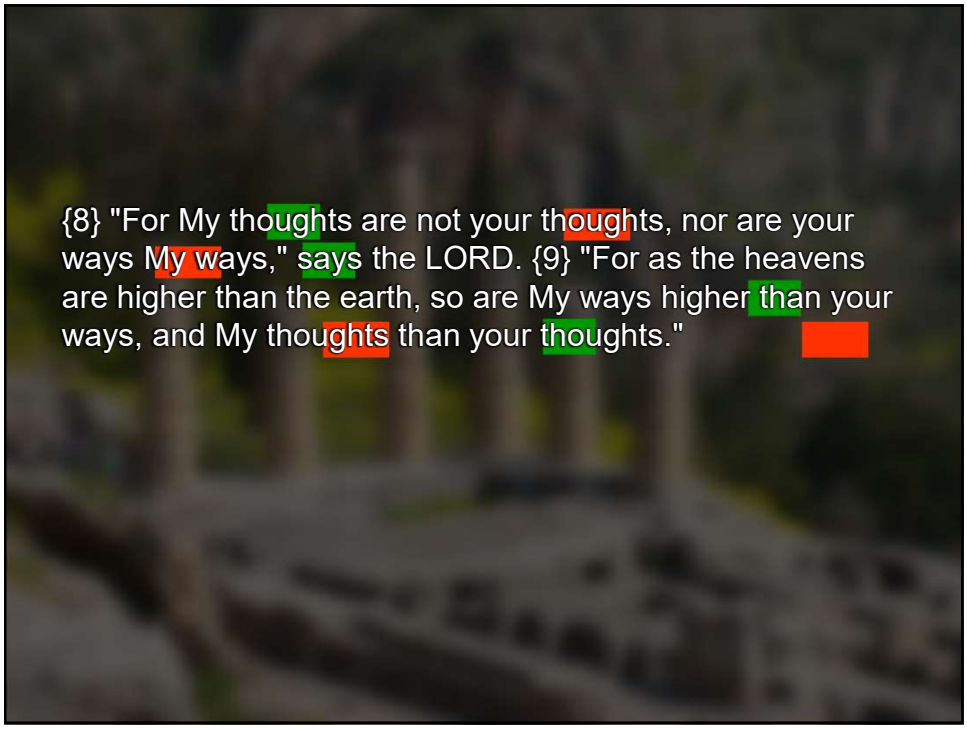
10


Come, Let Us
An Introduction to Logical Thinking
REASON
Norman L. Geisler
and
Ronald M. Brooks

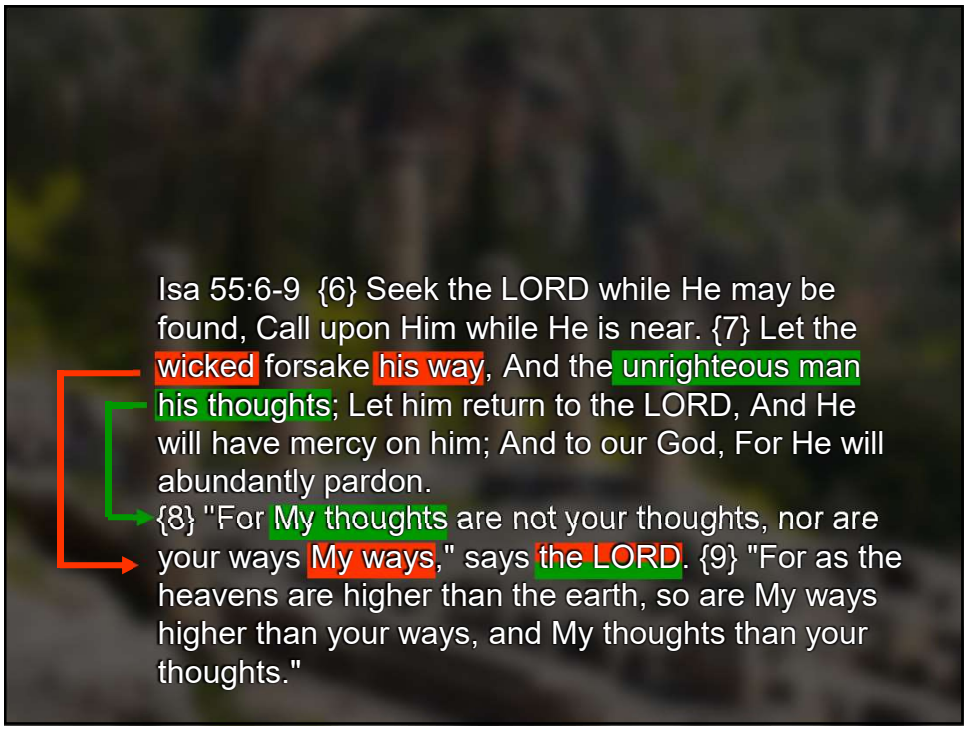
11


What about Isaiah 55:8-9?

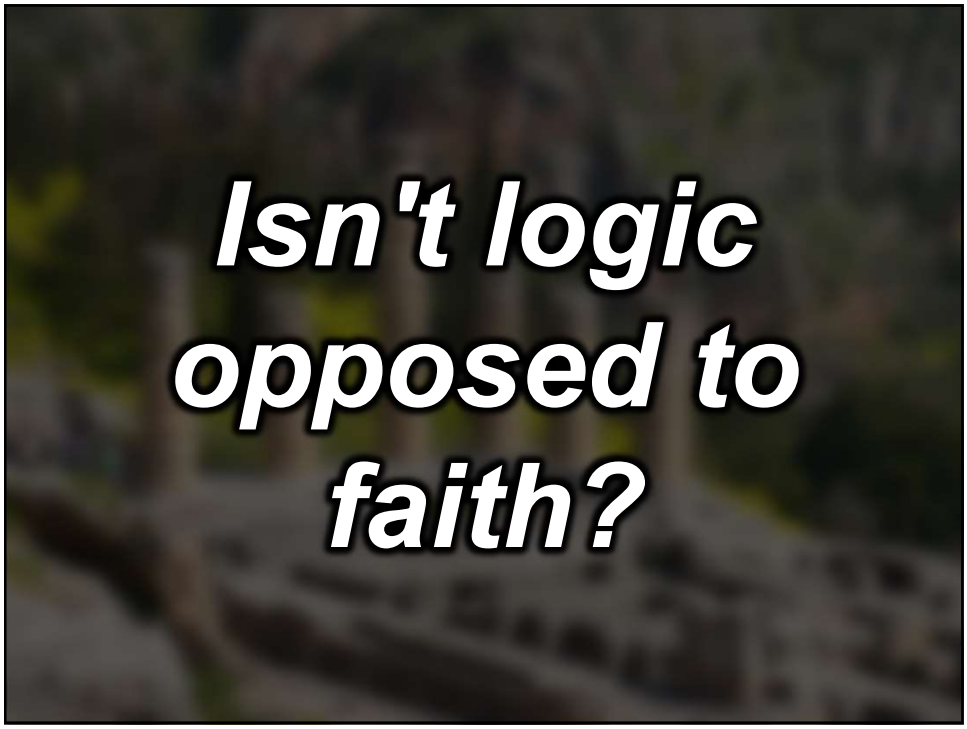
12


{8} "For My thoughts are not your thoughts, nor are your ways My ways," says the LORD. {9} "For as the heavens are higher than the earth, so are My ways higher than your ways, and My thoughts than your thoughts."

13


Isa 55:6-9 {6} Seek the LORD while He may be found, Call upon Him while He is near. {7} Let the wicked forsake his way, And the unrighteous man his thoughts; Let him return to the LORD, And He will have mercy on him; And to our God, For He will abundantly pardon.
{8} "For My thoughts are not your thoughts, nor are your ways My ways," says the LORD. {9} "For as the heavens are higher than the earth, so are My ways higher than your ways, and My thoughts than your thoughts."

14



15

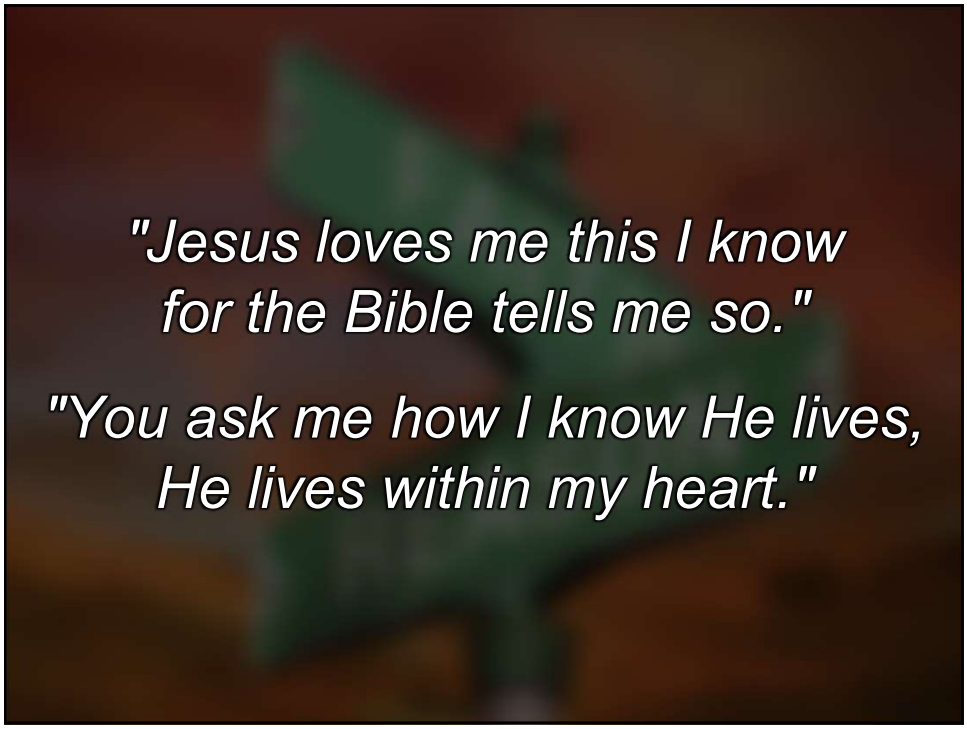
16

"Faith is believing in something when common sense tells you not to."

17

~~"Faith is believing in something when common sense tells you not to."~~

18



19

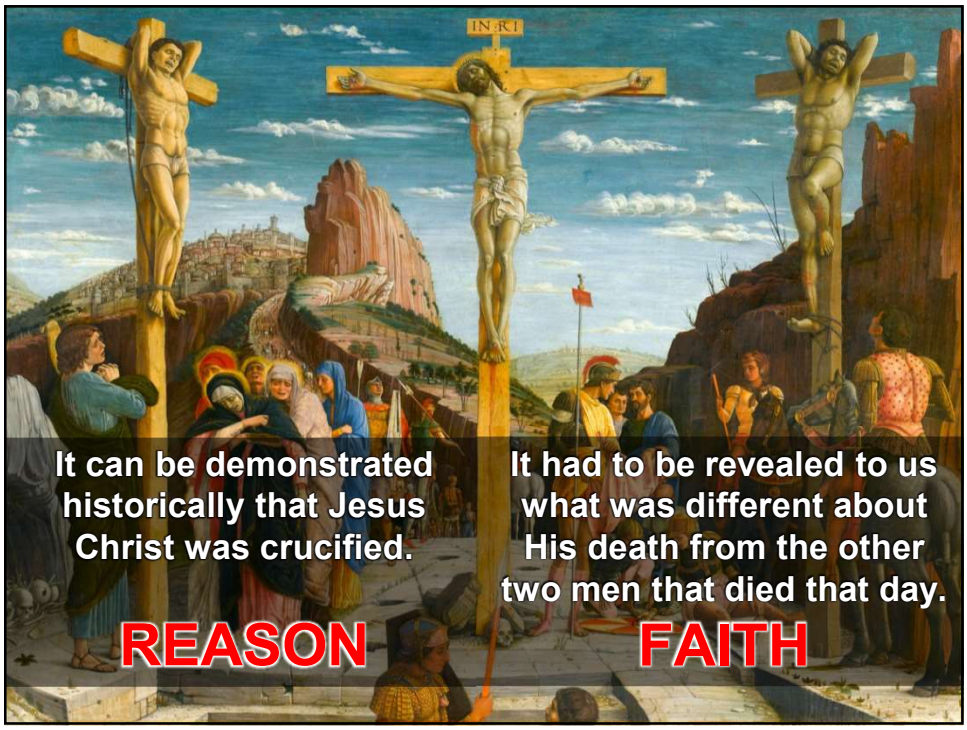
Faith	Reason
opinion	truth
values	facts
inner	outer
private	public
emotional	rational
feelings	thoughts
subjective	objective
religion	science
true for me	true for all

20

The Proper Conception

Reason	Faith
Believing those things demonstrated by appropriate disciplines, e.g., philosophy, science, mathematics, history	Believing those things revealed by God through Christ and Scripture that could not be discovered by reason alone
Certain truths can be discovered both about God and creation.	Certain truths are revealed both about God and creation.
- God's existence and attributes - DNA molecule - Fermat's Last Theorem	- The Trinity - The Gospel - Second Coming
General Revelation Rom. 1:19-20 Psalm 19:1-4	Special Revelation 2 Peter 1:21 Col. 2:9; John 14:9

21



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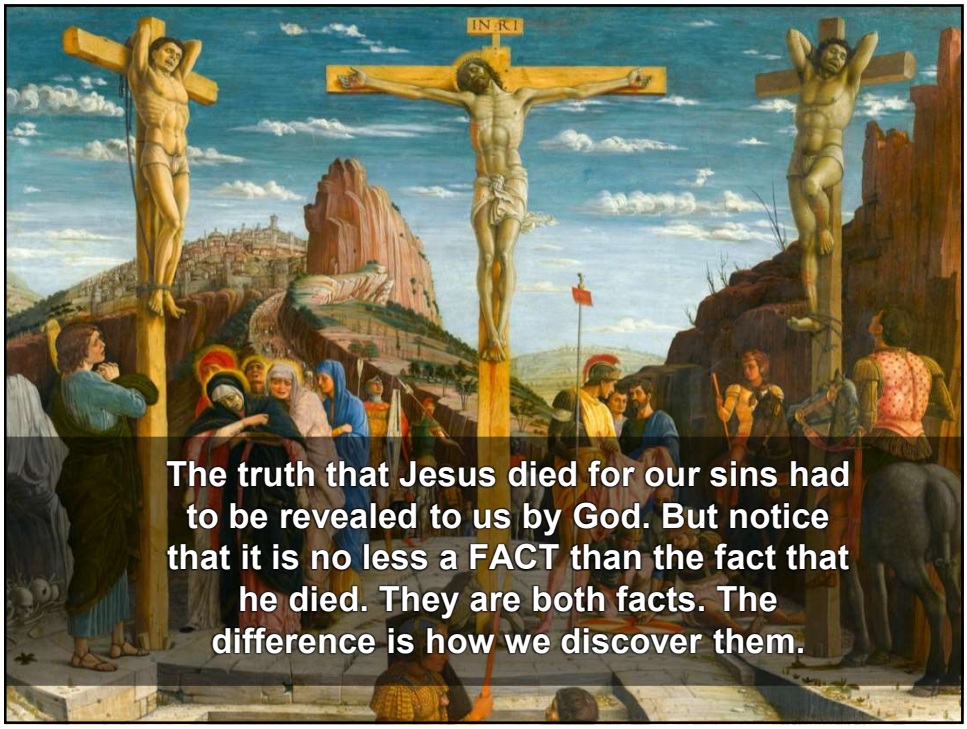
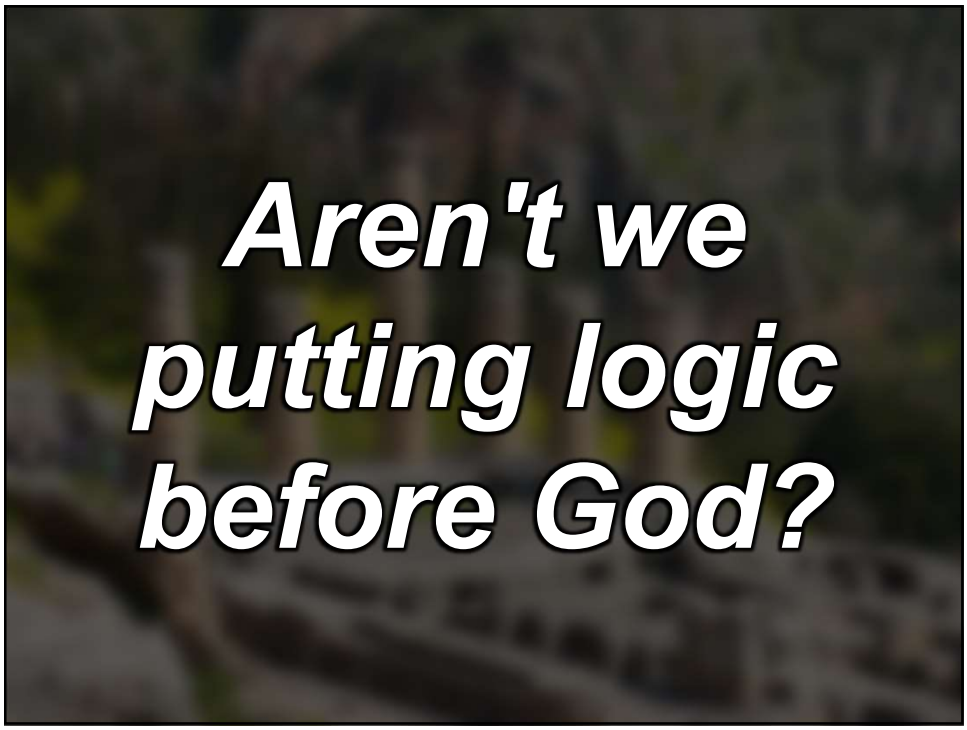

INRI
The truth that Jesus died for our sins had to be revealed to us by God. But notice that it is no less a FACT than the fact that he died. They are both facts. The difference is how we discover them.

23


Aren't we putting logic before God?

24

Response

There is a difference between "the order of knowing" and "the order of being"

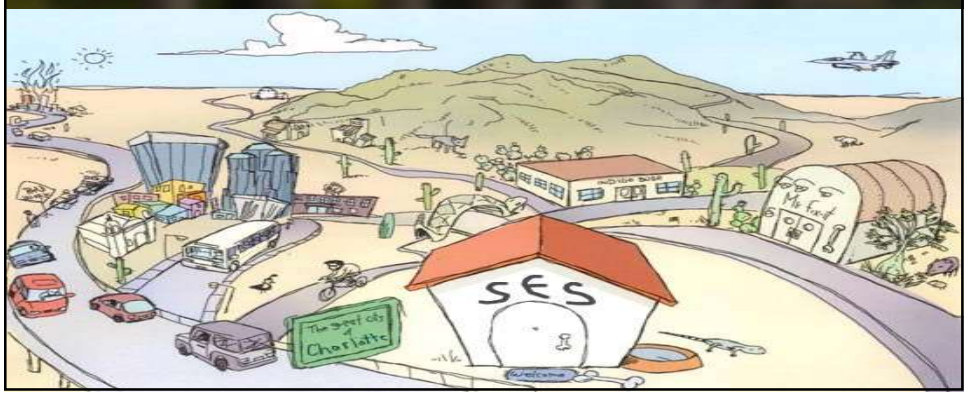
map to SES example

The order of knowing vs. the order of being

25

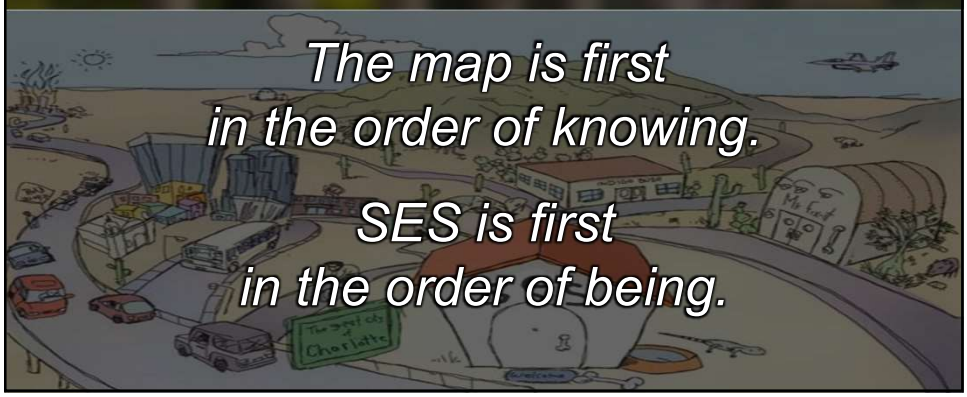
Response

map to destination example



26

Response



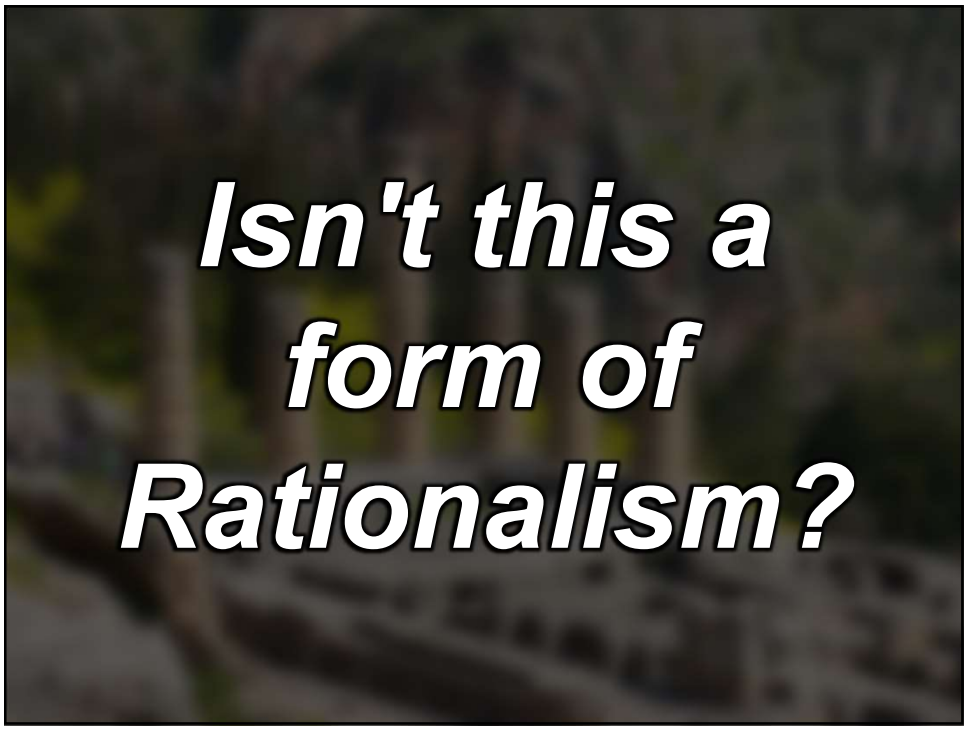
27

Aren't we putting OUR logic before God?

28

Response
It is not "our" logic.
Logic is an expression of
the nature of God Himself.

29


Isn't this a
form of
Rationalism?

30

Response

There is a difference between being rational and Rationalism.

The notions of self-evident truths or rationally inescapable truths do not constitute Rationalism.

31

Isn't this limiting God? After all, can't God do the impossible? Is there anything God cannot do?

32

Response

God cannot violate His own nature.

Logic is an expression of the nature of God Himself.

33

Can't God break the laws He creates?

34

Response

Logic was not created by God. It is an expression of God. (like goodness)

35

Don't some doctrines involve contradictions, like the Trinity?

36

Response

There is nothing in the doctrine of the Trinity (or any other biblical doctrine) that is illogical.

There is a difference between something being beyond reason and something being against reason.

37

If logic is so helpful, how can such a great logician as the atheist philosopher Bertrand Russell be so far from the truth?

38

Response

If you start a race facing the wrong direction, then the faster you can run, the quicker you will be in getting farther from the finish line.

39

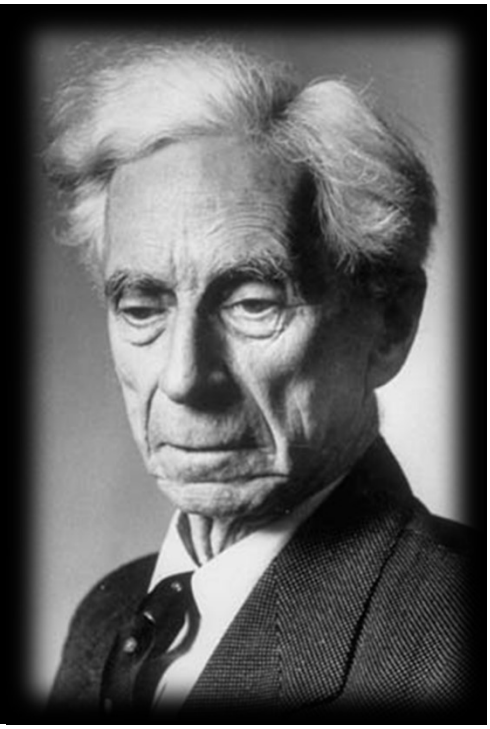
Bertrand Russell

1872-1970

11th August, 1918

It is quite true what you say, that you have never expressed yourself – but who has, that has anything to express? The things one says are all unsuccessful attempts to say something else – something that perhaps by its very nature cannot be said. I know that I have struggled all my life to say something that I never shall learn how to say. And it is the same with you. It is so with all who spend their lives in the quest of something elusive, and yet omnipresent, and at once subtle and infinite. One seeks it in music, and the sea, and sunsets; at times I have seemed very near it in crowds when I have been feeling strongly what they were feeling; one seeks it in love above all. But if one lets oneself imagine one has found it, some cruel irony is sure to come and show one that it is not really found. (I have come nearest to expressing myself in the chapter on Education in *Social Reconstruction*. But it is a very long way from a really full self-expression. You are hindered by timidity.)

The outcome is that one is a ghost, floating through the world without any real contact. Even when one feels nearest to other people, something in one seems obstinately to belong to God and to refuse to enter into any earthly communion – at least that is how I should express it if I thought there was a God. It is odd isn't it? I care passionately for this world, and many things and people in it, and yet . . . what is it all? There *must* be something more important, one feels, though I don't *believe* there is. I am haunted – some ghost, from some extramundane region, seems always trying to tell me something that I am to repeat to the world, but I cannot understand the message. But it is from listening to the ghost that one comes to feel oneself a ghost. I feel I shall find the truth on my deathbed and be surrounded by people too stupid to understand – fussing about medicines instead of searching



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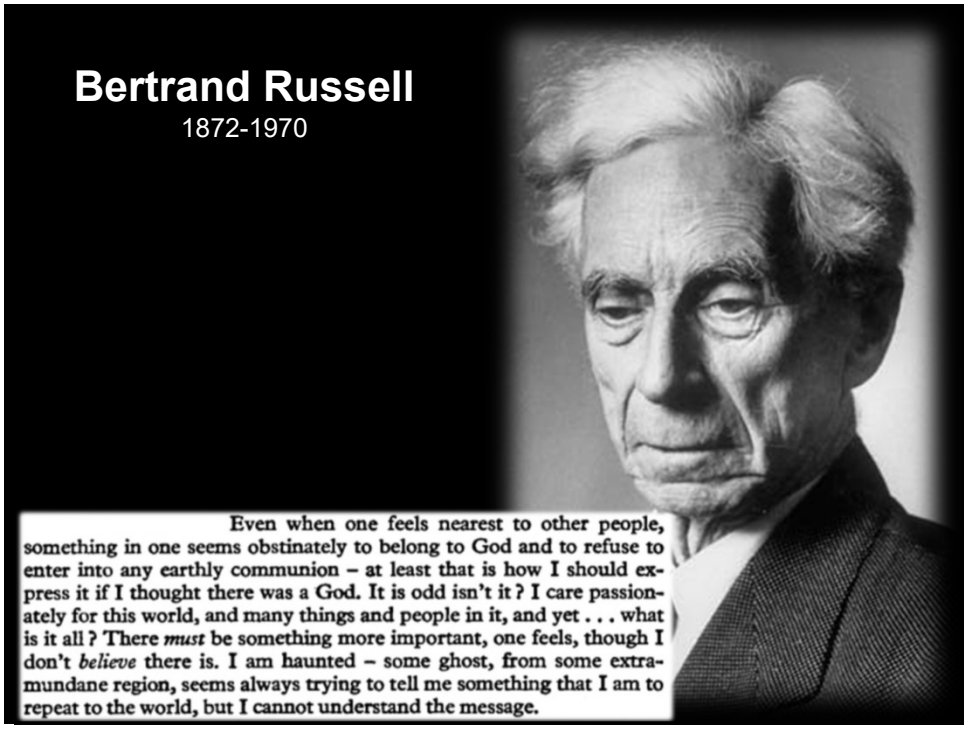

Bertrand Russell
1872-1970
Even when one feels nearest to other people, something in one seems obstinately to belong to God and to refuse to enter into any earthly communion – at least that is how I should express it if I thought there was a God. It is odd isn't it? I care passionately for this world, and many things and people in it, and yet . . . what is it all? There *must* be something more important, one feels, though I don't *believe* there is. I am haunted – some ghost, from some extra-mundane region, seems always trying to tell me something that I am to repeat to the world, but I cannot understand the message.

41

Terms in Logic

42

➢TRUTH VALUE➢

A sentence has a truth value when it can be said that the sentence is either true or false.

43

➢PROPOSITION➢

A proposition is a sentence with a truth value.

Some sentences do not have a truth value, such as questions, commands, and exclamations.

44

➢ARGUMENT➢

An argument is a set of two or more propositions offered forth to support, demonstrate, or prove another proposition.

The propositions offered forth are premises.

The proposition supported, demonstrated, or proven is the conclusion.

45

➢DEDUCTIVE➢

An argument is deductive when the premises are offered forth to make the conclusion necessary.

If the premises are true, then the conclusion is necessarily true.

46

➢INDUCTIVE➢

An argument is inductive when the premises are offered forth to make the conclusion probable.

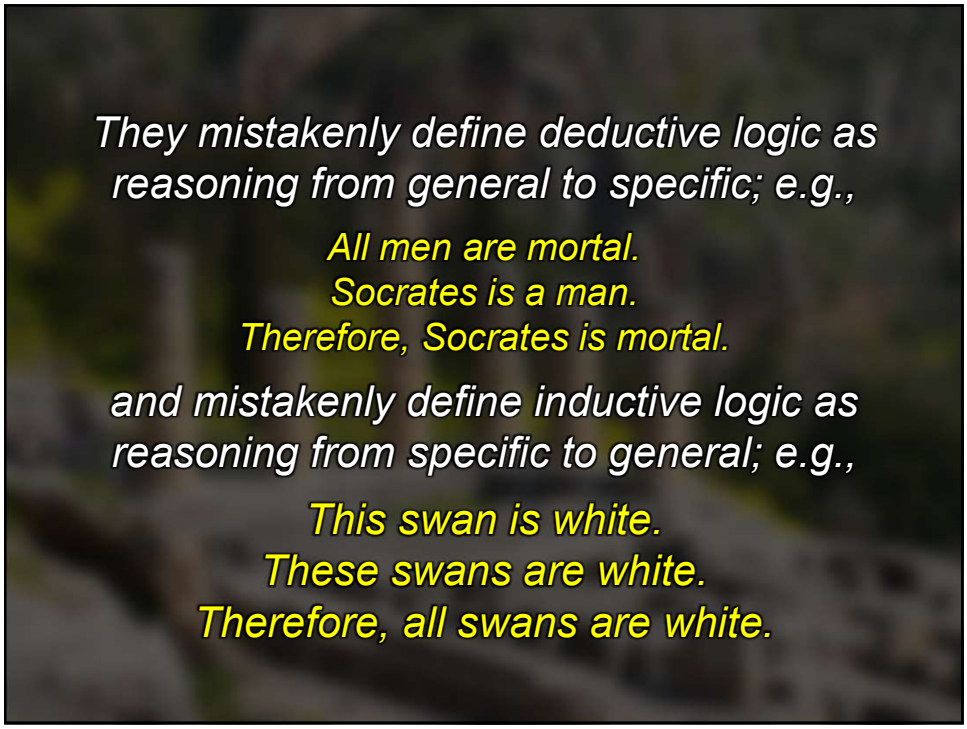
If the premises are true, then conclusion is probably true.

Note that this is a logical definition of 'induction' and not a metaphysical one.

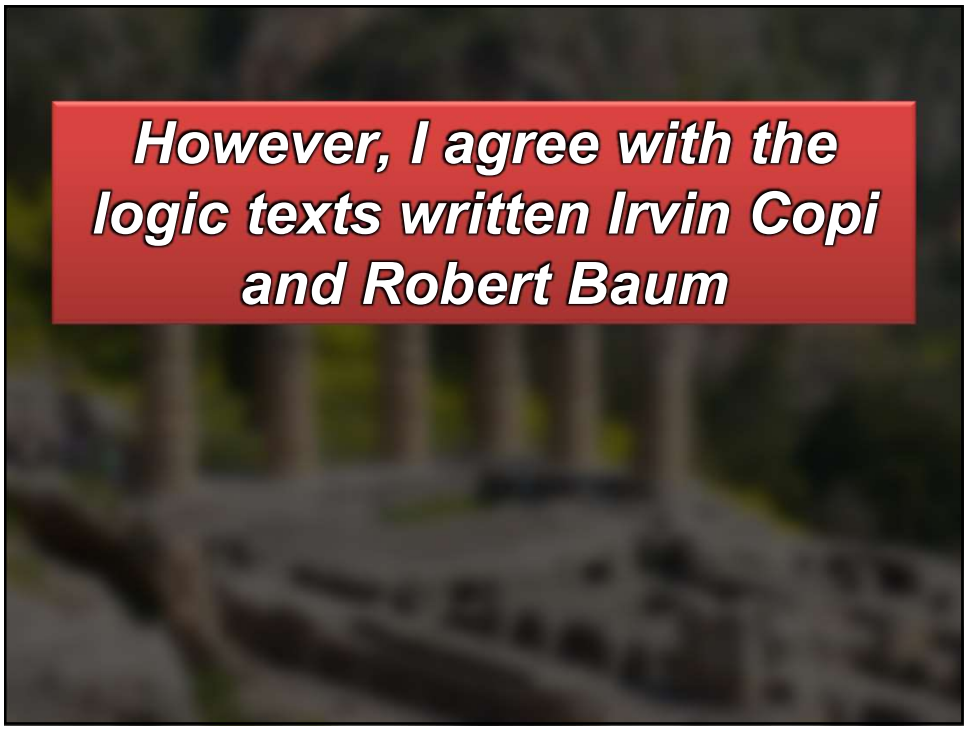
47

Be aware that some logic texts have poor definition of deductive and inductive logic.

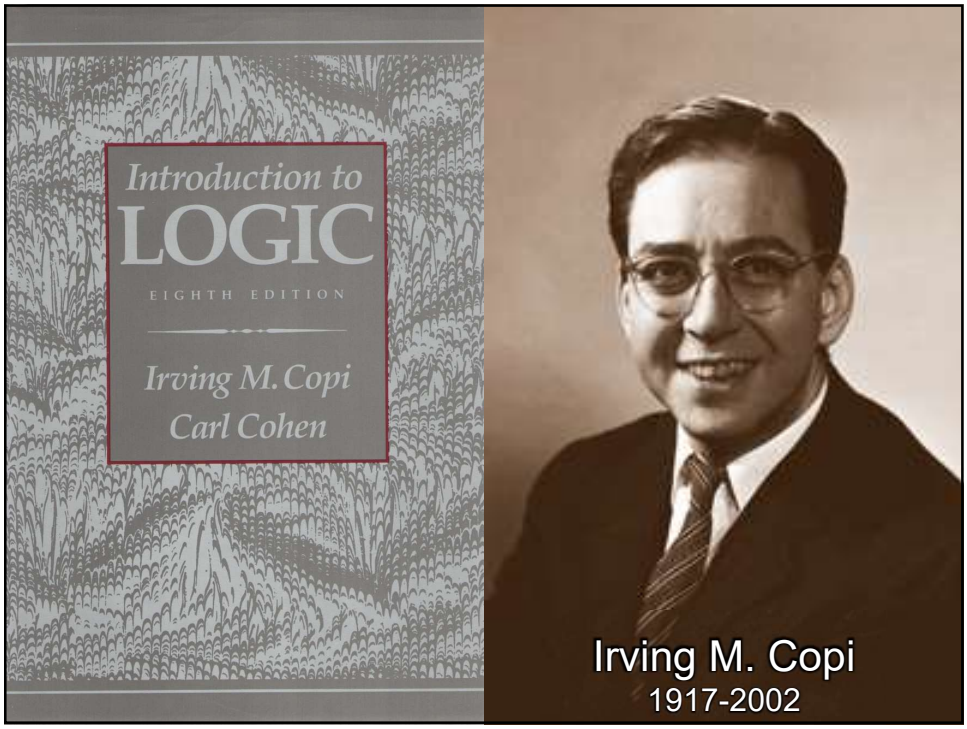
48


They mistakenly define deductive logic as reasoning from general to specific; e.g.,
All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.
and mistakenly define inductive logic as reasoning from specific to general; e.g.,
This swan is white.
These swans are white.
Therefore, all swans are white.

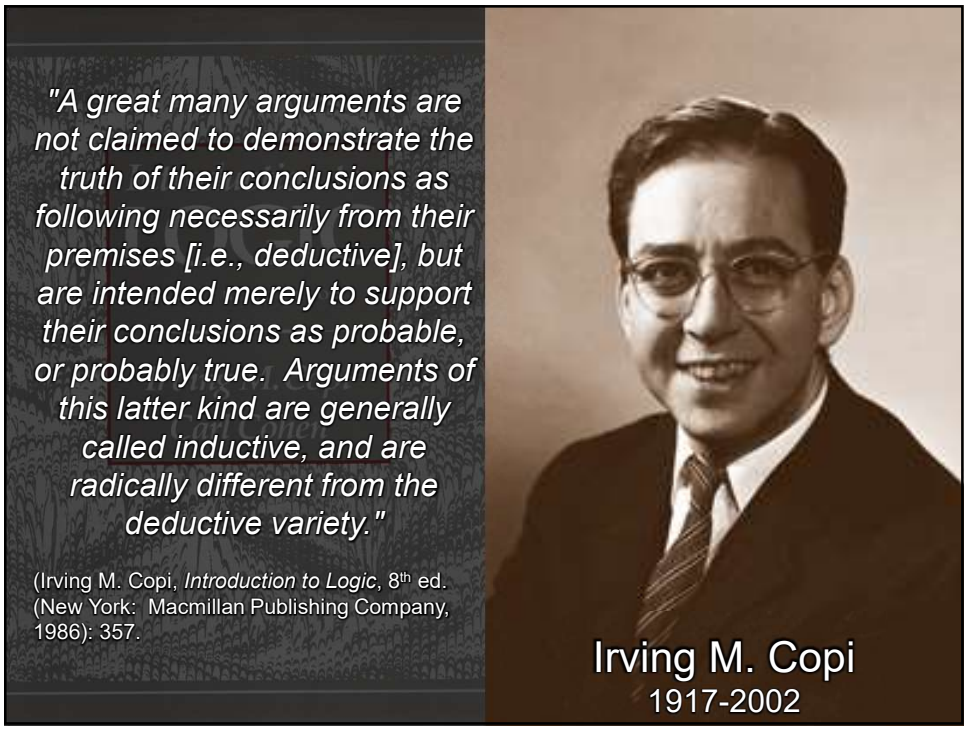
49


However, I agree with the logic texts written Irvin Copi and Robert Baum

50


Introduction to
LOGIC
EIGHTH EDITION
Irving M. Copi
Carl Cohen
Irving M. Copi
1917-2002

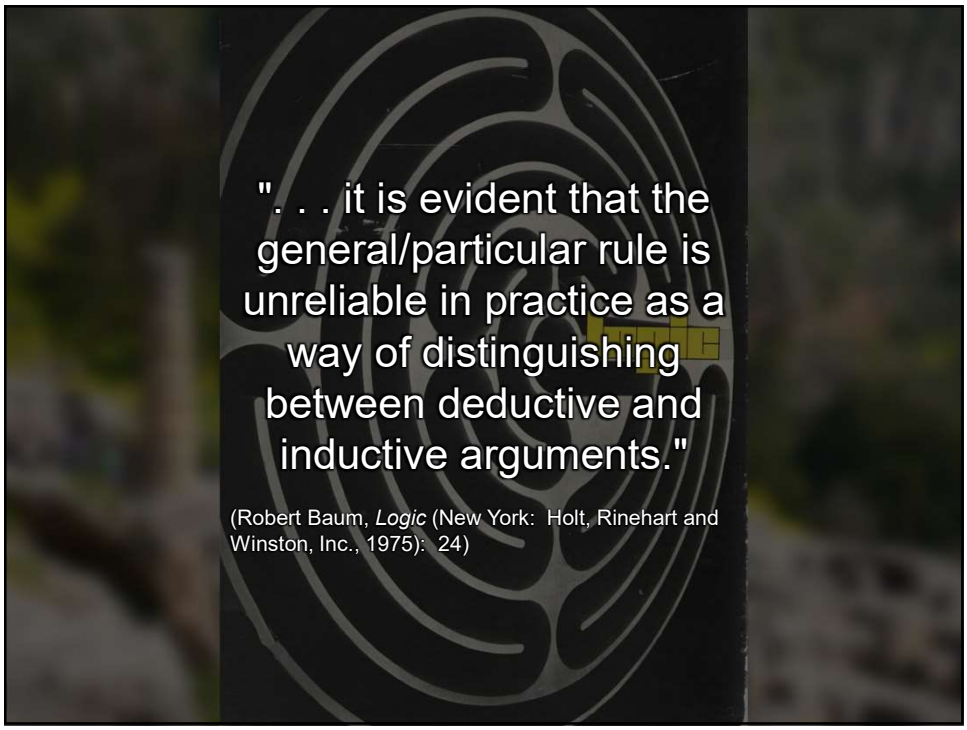
51


"A great many arguments are not claimed to demonstrate the truth of their conclusions as following necessarily from their premises [i.e., deductive], but are intended merely to support their conclusions as probable, or probably true. Arguments of this latter kind are generally called inductive, and are radically different from the deductive variety."
(Irving M. Copi, Introduction to Logic, 8th ed. (New York: Macmillan Publishing Company, 1986): 357.
Irving M. Copi
1917-2002

52

logic

53


". . . it is evident that the general/particular rule is unreliable in practice as a way of distinguishing between deductive and inductive arguments."
(Robert Baum, *Logic* (New York: Holt, Rinehart and Winston, Inc., 1975): 24)

54

➢VALID / INVALID➢

Strictly speaking, only arguments are valid or invalid, not specific ideas or points.

Validity has to do with only deductive arguments.

Inductive arguments are never said to be valid, but instead are said to be strong or weak.

55

➢VALID / INVALID➢

A deductive argument is valid when the premises actually do necessitate the conclusion (as deduction is intended to do).

In other words, a deductive argument is valid with it does not break any of the formal rules for validity.

56

➢VALID / INVALID➢

A deductive argument can be valid and yet still have a false conclusion.

The Sun is 60 miles from the Earth.
Light travels at 60 miles per hour.
Therefore, light will take an hour to get from the Sun to the Earth.

A valid deductive argument can have a false conclusion only if at least one of its premises is false.

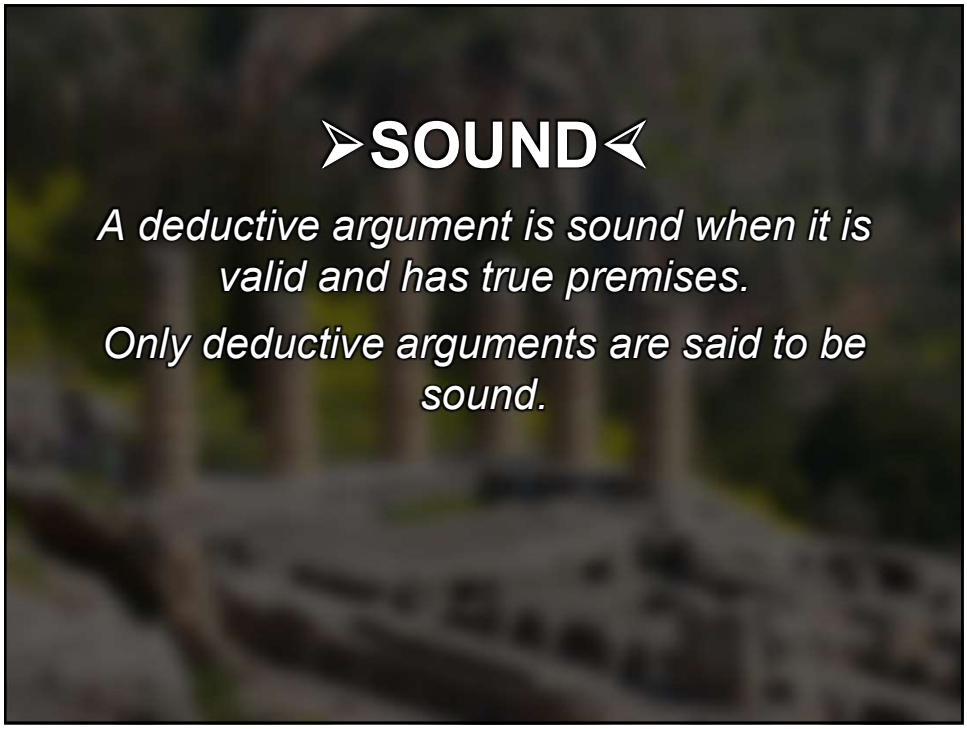
57

➢VALID / INVALID➢

Further, a deductive argument can be invalid and yet still have a true conclusion.

All dogs are warm blooded.
All mammals are warm blooded.
Therefore, all dogs are mammals.

58


SOUND
A deductive argument is sound when it is valid and has true premises.
Only deductive arguments are said to be sound.

59

Categorical Logic

60

Categorical logic utilizes categorical propositions.

A proposition is categorical when it includes or excludes all or some of one category of things in / from another category of things.

61

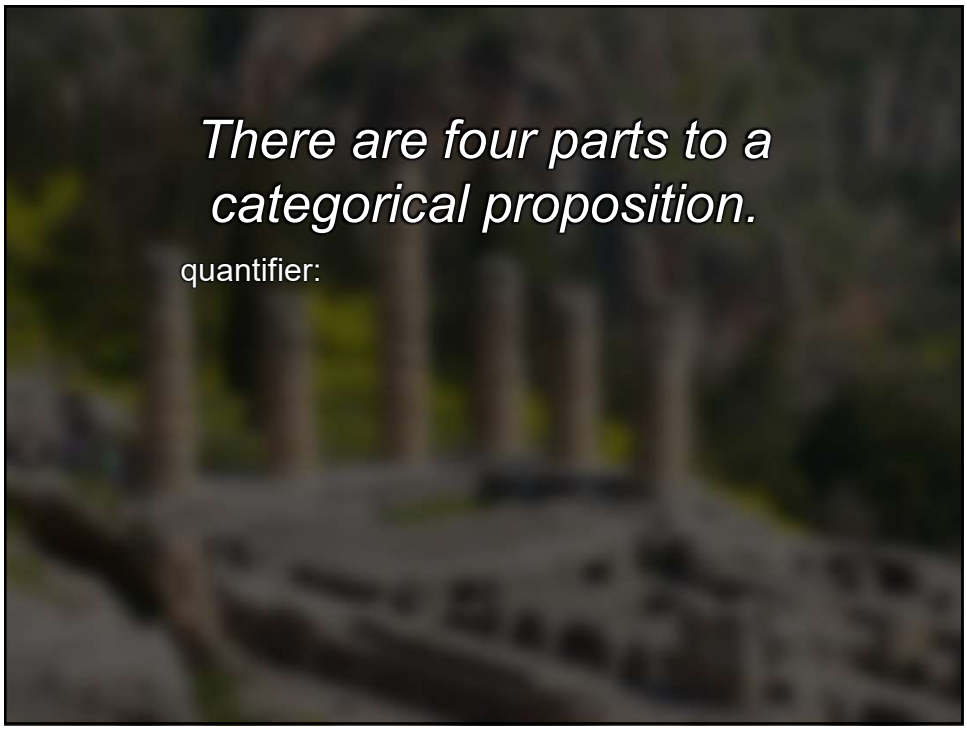
Take, for example, the proposition "All men are mortal."

The entire category of things that are men is contained within the category of things that are mortal.

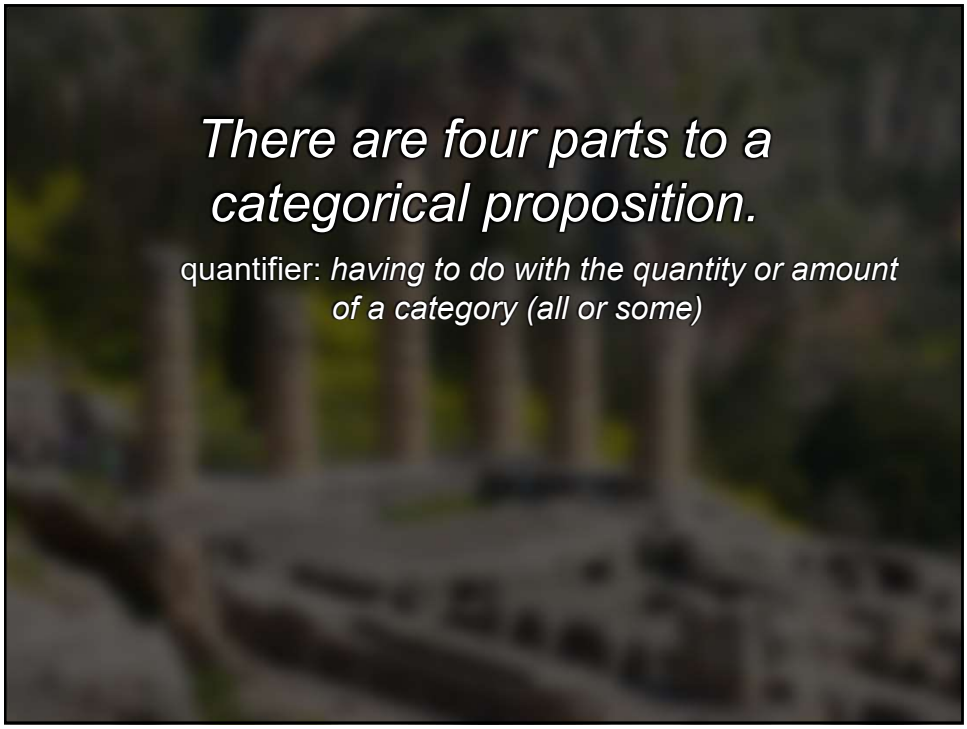
62

There are four parts to a categorical proposition.

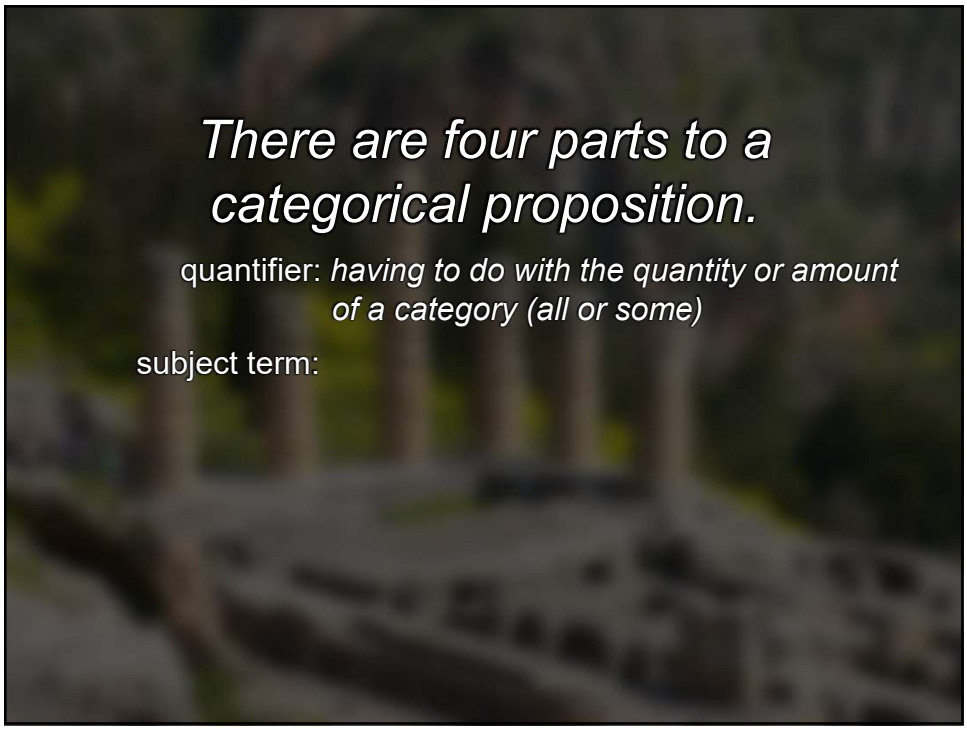
63


There are four parts to a categorical proposition.
quantifier:

64


There are four parts to a categorical proposition.
quantifier: having to do with the quantity or amount of a category (all or some)

65


There are four parts to a categorical proposition.
quantifier: having to do with the quantity or amount of a category (all or some)
subject term:

66

There are four parts to a categorical proposition.

quantifier: *having to do with the quantity or amount of a category (all or some)*

subject term: *the subject of the proposition designating a category of things*

67

There are four parts to a categorical proposition.

quantifier: *having to do with the quantity or amount of a category (all or some)*

subject term: *the subject of the proposition designating a category of things*

predicate term:

68

There are four parts to a categorical proposition.

quantifier: *having to do with the quantity or amount of a category (all or some)*

subject term: *the subject of the proposition designating a category of things*

predicate term: *the predicate of the proposition designating a second category of things*

69

There are four parts to a categorical proposition.

quantifier: *having to do with the quantity or amount of a category (all or some)*

subject term: *the subject of the proposition designating a category of things*

predicate term: *the predicate of the proposition designating a second category of things*

copula:

70

There are four parts to a categorical proposition.

quantifier: *having to do with the quantity or amount of a category (all or some)*

subject term: *the subject of the proposition designating a category of things*

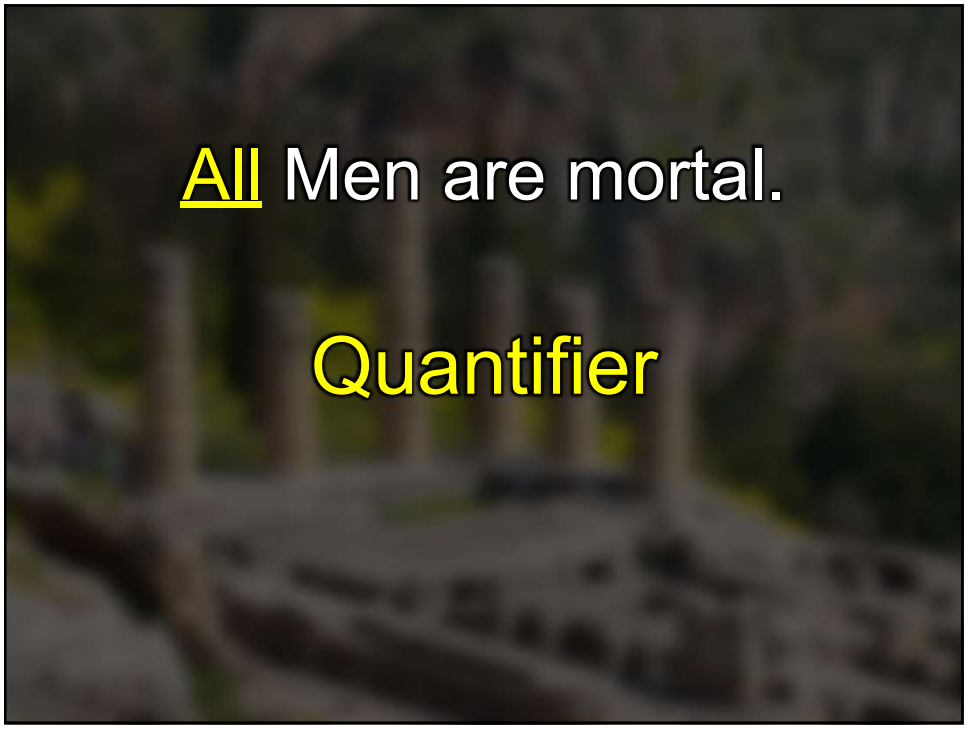
predicate term: *the predicate of the proposition designating a second category of things*

copula: *the "is / are" or "is not / are not;" the quality which is including or excluding*

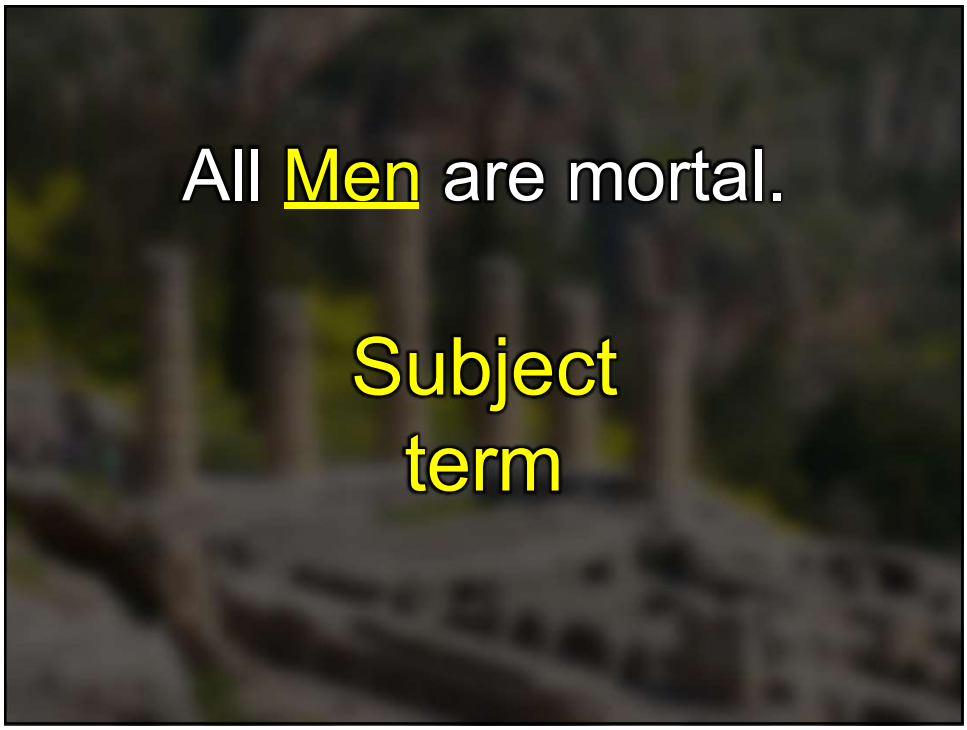
71

All Men are mortal.

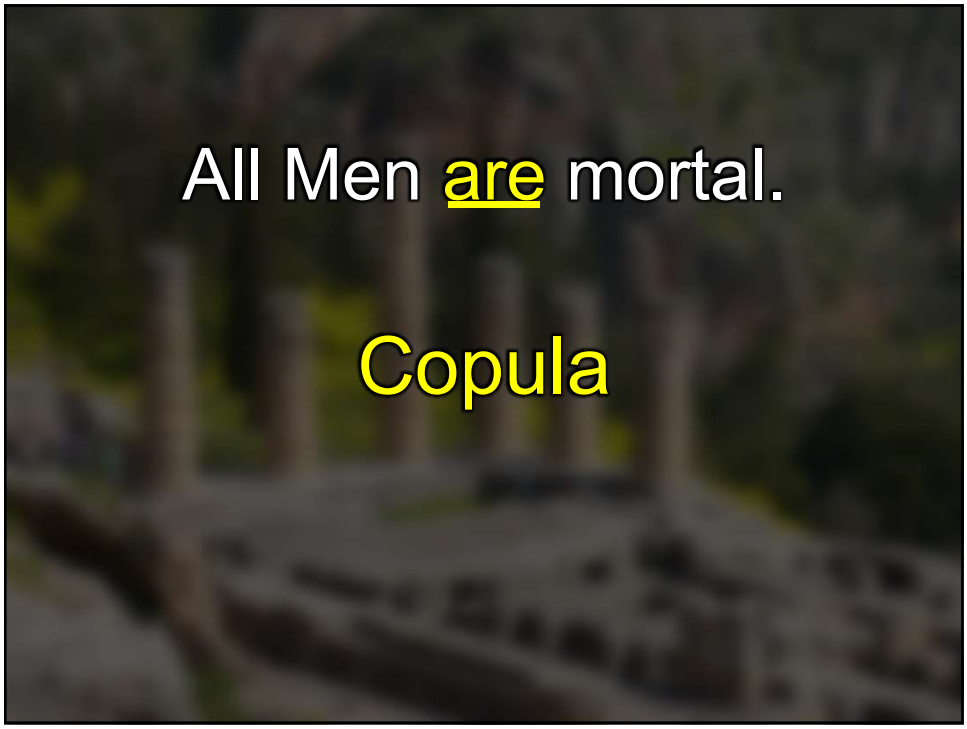
72


All Men are mortal.
Quantifier

73


All Men are mortal.
Subject term

74



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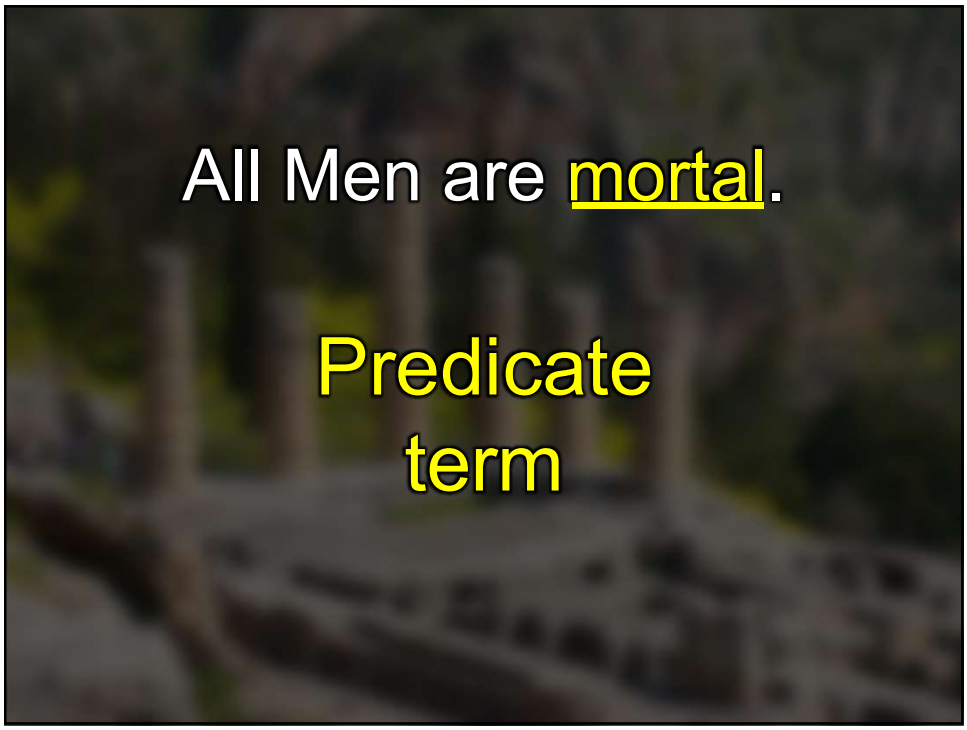

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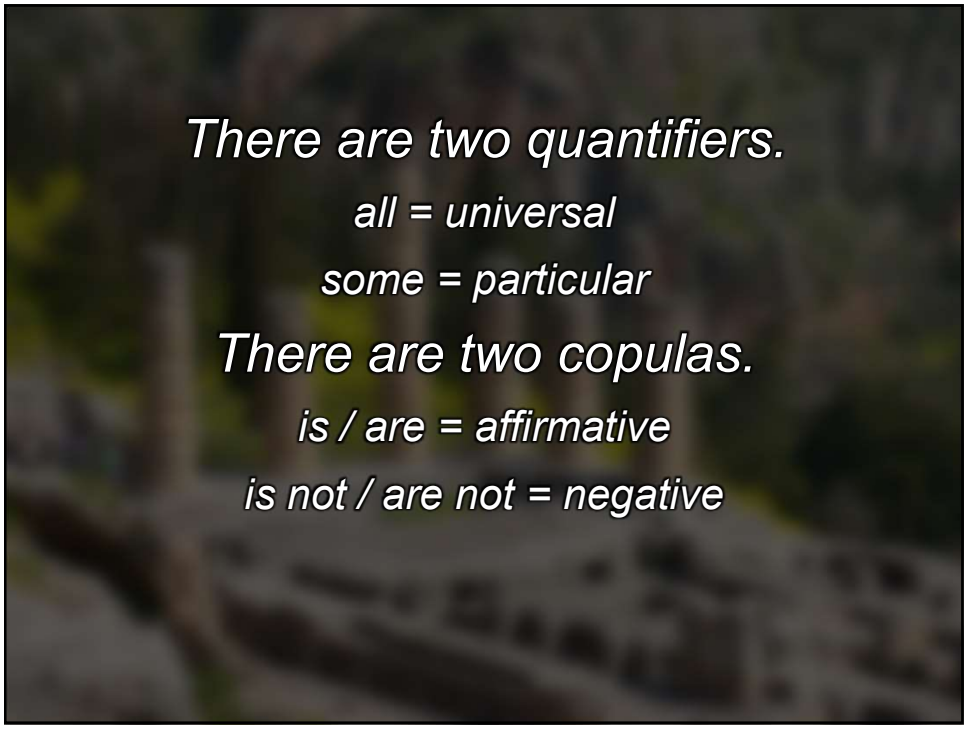
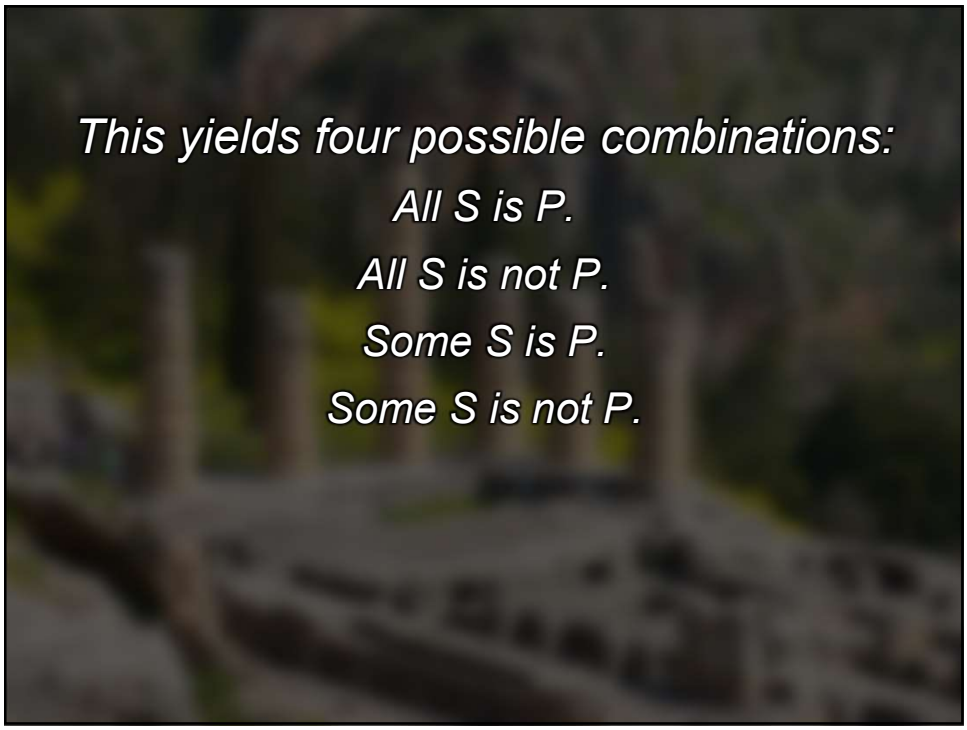
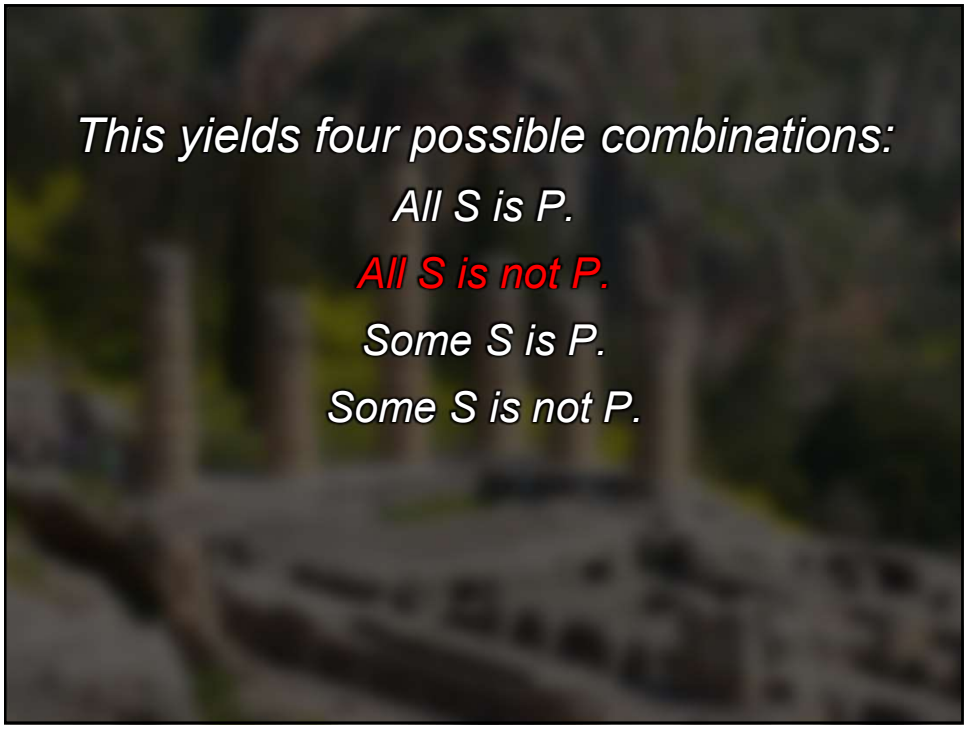

There are two quantifiers.
all = universal
some = particular
There are two copulas.
is / are = affirmative
is not / are not = negative

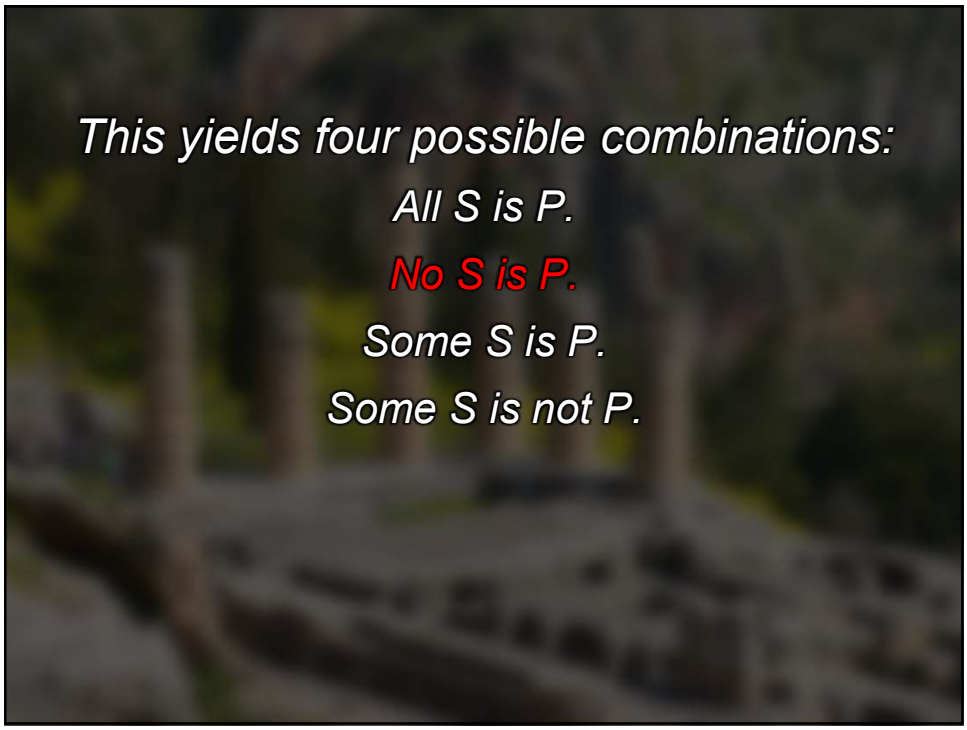
77


This yields four possible combinations:
All S is P.
All S is not P.
Some S is P.
Some S is not P.

78


This yields four possible combinations:
All S is P.
All S is not P.
Some S is P.
Some S is not P.

79


This yields four possible combinations:
All S is P.
No S is P.
Some S is P.
Some S is not P.

80

All S is P. *Includes the entire category of S in the category of P.*

No S is P. *Excludes the entire category of S from the category of P.*

Some S is P. *Includes some of the category of S in the category of P.*

Some S is not P. *Excludes some of the category of S from the category of P.*

81

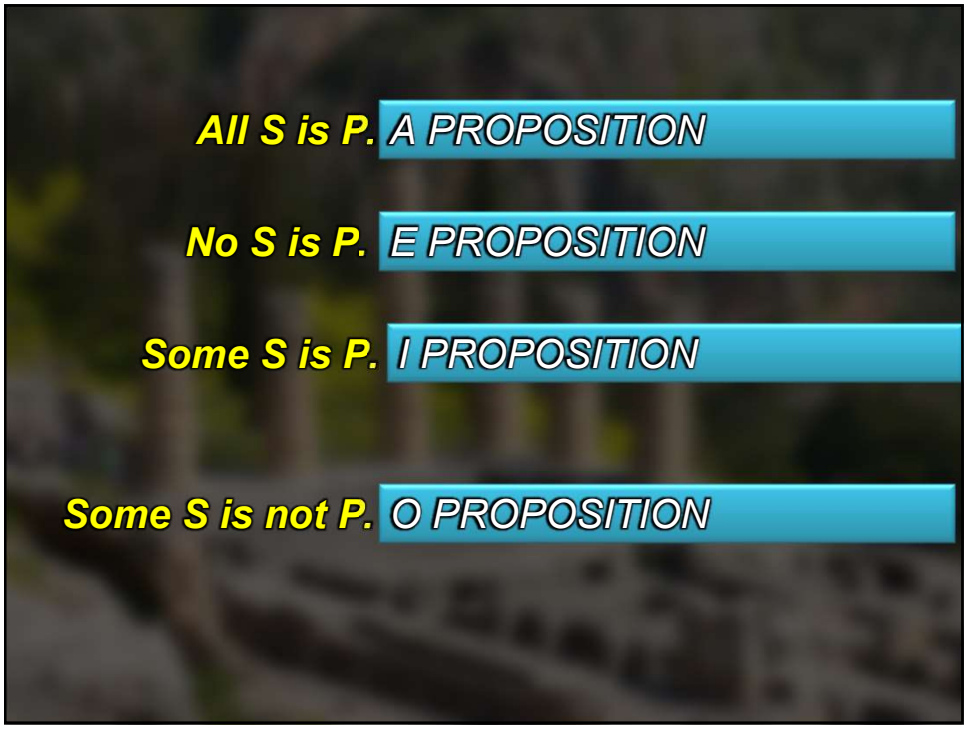
All S is P. UNIVERSAL AFFIRMATIVE

No S is P. UNIVERSAL NEGATIVE

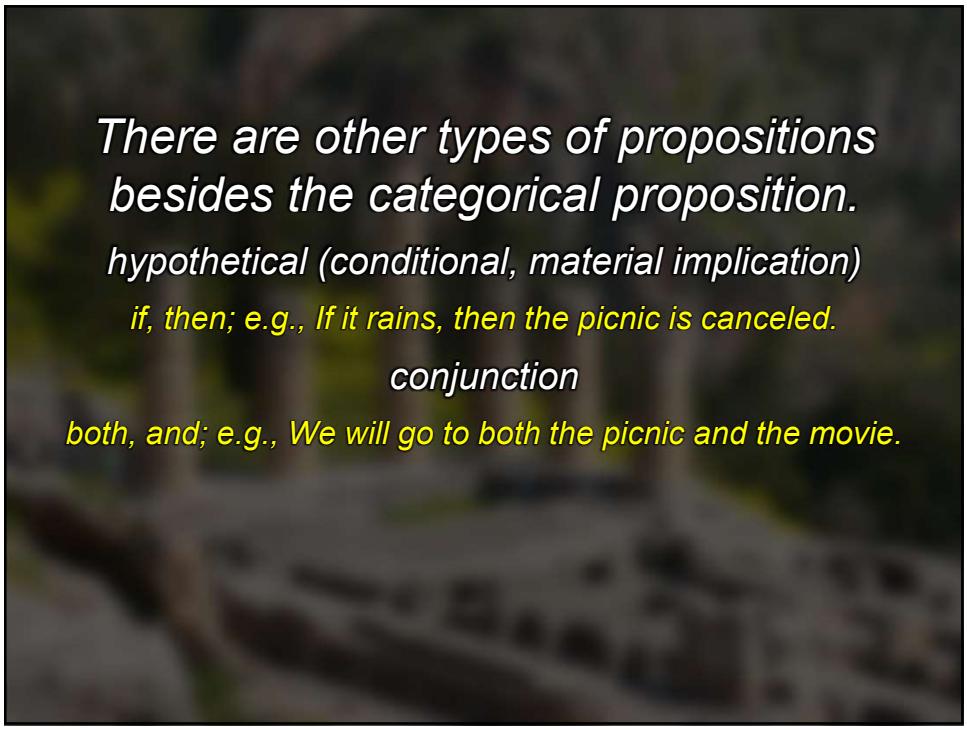
Some S is P. PARTICULAR AFFIRMATIVE

Some S is not P. PARTICULAR NEGATIVE

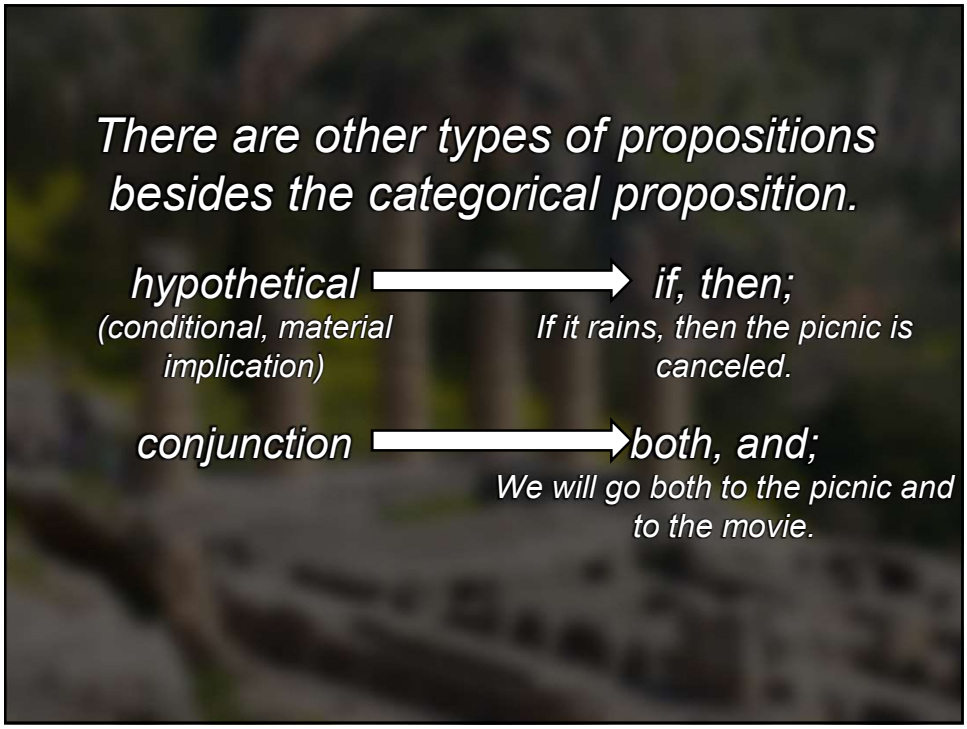
82


All S is P. A PROPOSITION
No S is P. E PROPOSITION
Some S is P. I PROPOSITION
Some S is not P. O PROPOSITION

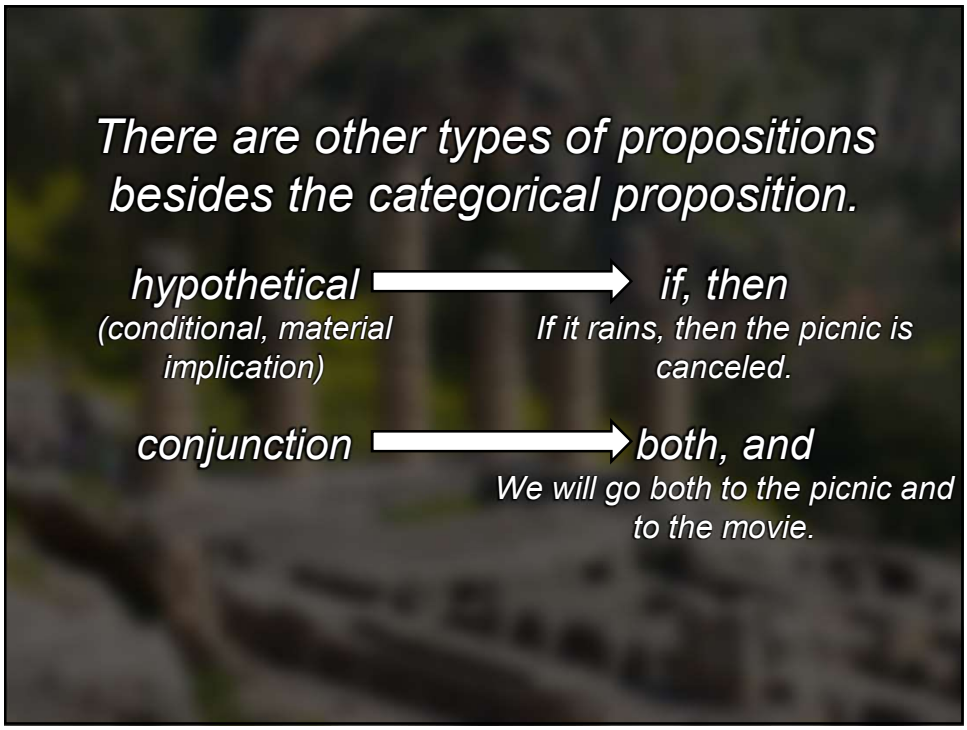
83


There are other types of propositions besides the categorical proposition.
hypothetical (conditional, material implication)
if, then; e.g., If it rains, then the picnic is canceled.
conjunction
both, and; e.g., We will go to both the picnic and the movie.

84


There are other types of propositions besides the categorical proposition.
hypothetical
(conditional, material implication)
if, then;
If it rains, then the picnic is canceled.
conjunction
both, and;
We will go both to the picnic and to the movie.

85


There are other types of propositions besides the categorical proposition.
hypothetical
(conditional, material implication)
if, then
If it rains, then the picnic is canceled.
conjunction
both, and
We will go both to the picnic and to the movie.

86

There are other types of propositions besides the categorical proposition.

disjunction → *either, or*

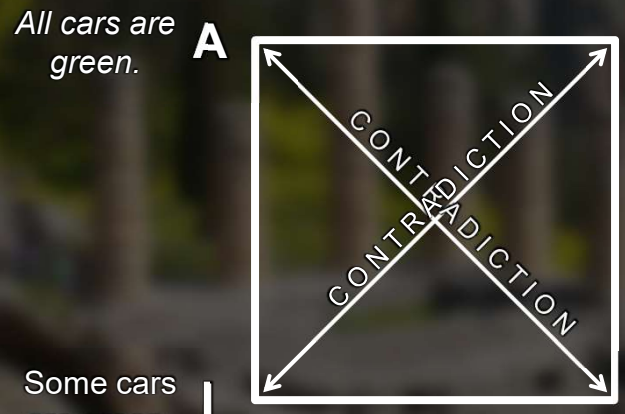
Either we will go the picnic or go to the movie (or both).

bi-conditional → *if and only if*

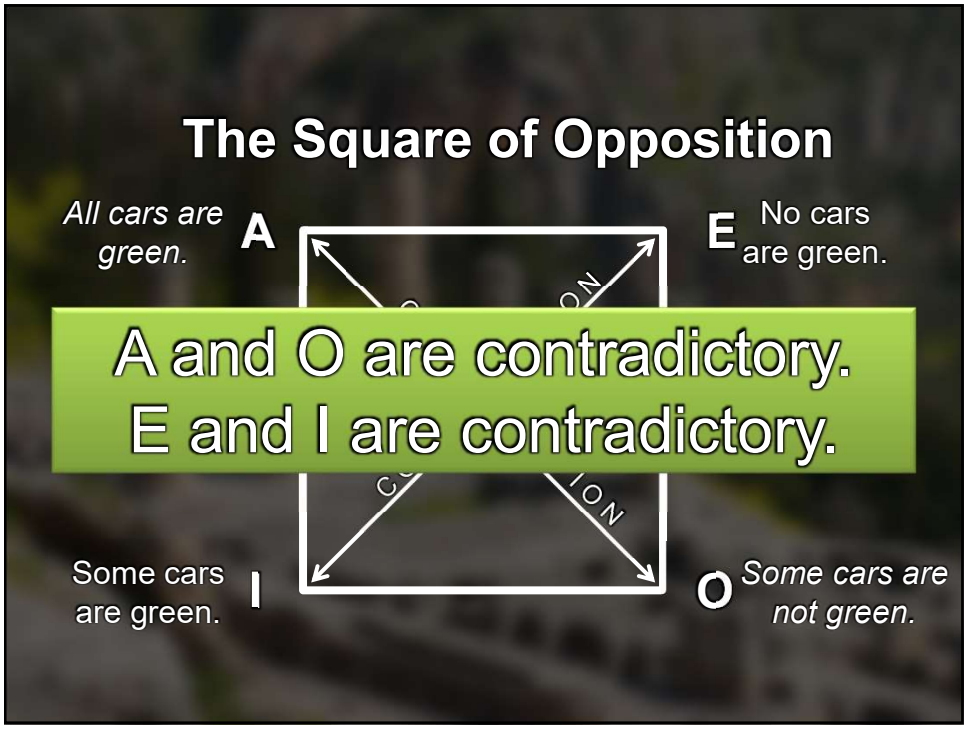
We will go to the movie if and only if it starts late enough.

87

The Square of Opposition



88



89

☞*Contradictions*☜

always have opposite truth values

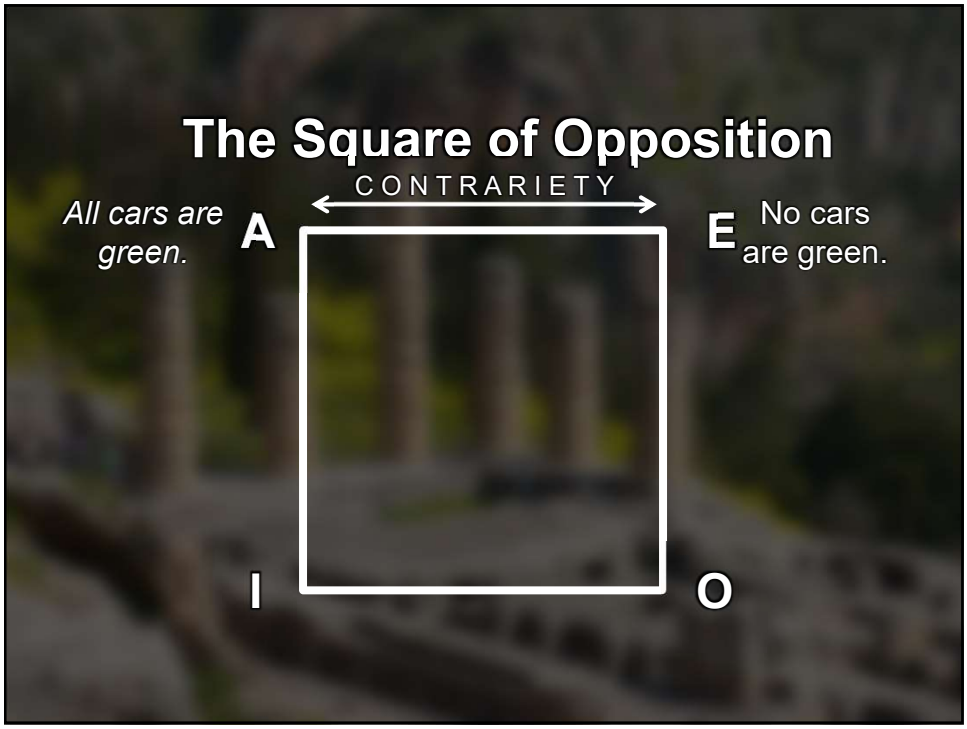
if one is true, the other has to be false

if one is false, the other has to be true

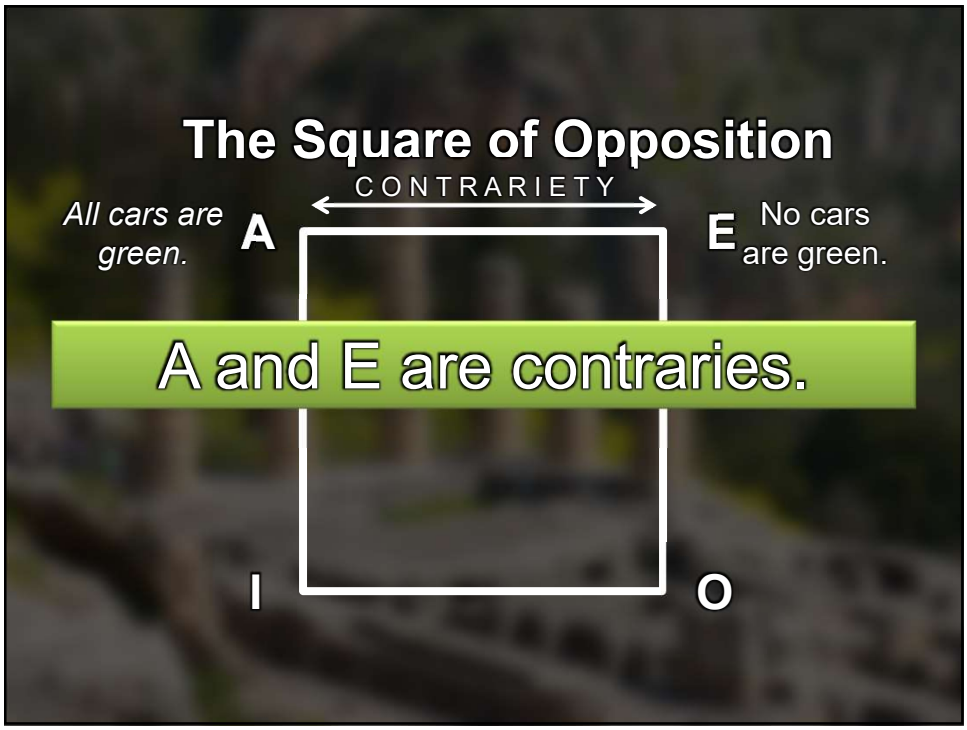
cannot both be true at the same time

cannot both be false at the same time

90


The Square of Opposition
CONTRARIETY
All cars are green.
A
E
No cars are green.
I
O

91


The Square of Opposition
CONTRARIETY
All cars are green.
A
E
No cars are green.
A and E are contraries.
I
O

92

☞ *Contraries* ☜

if one is true, the other has to be false

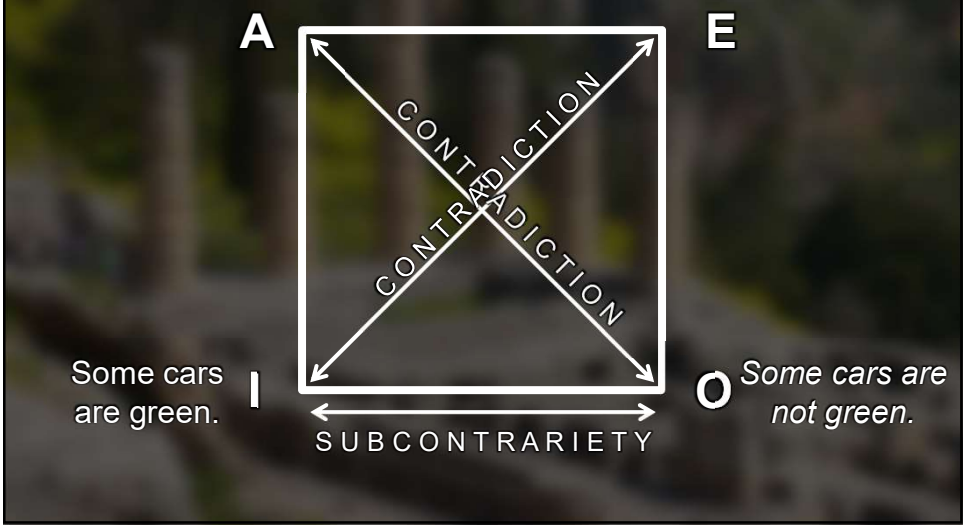
if one is false, the other is unknown

cannot both be true at the same time

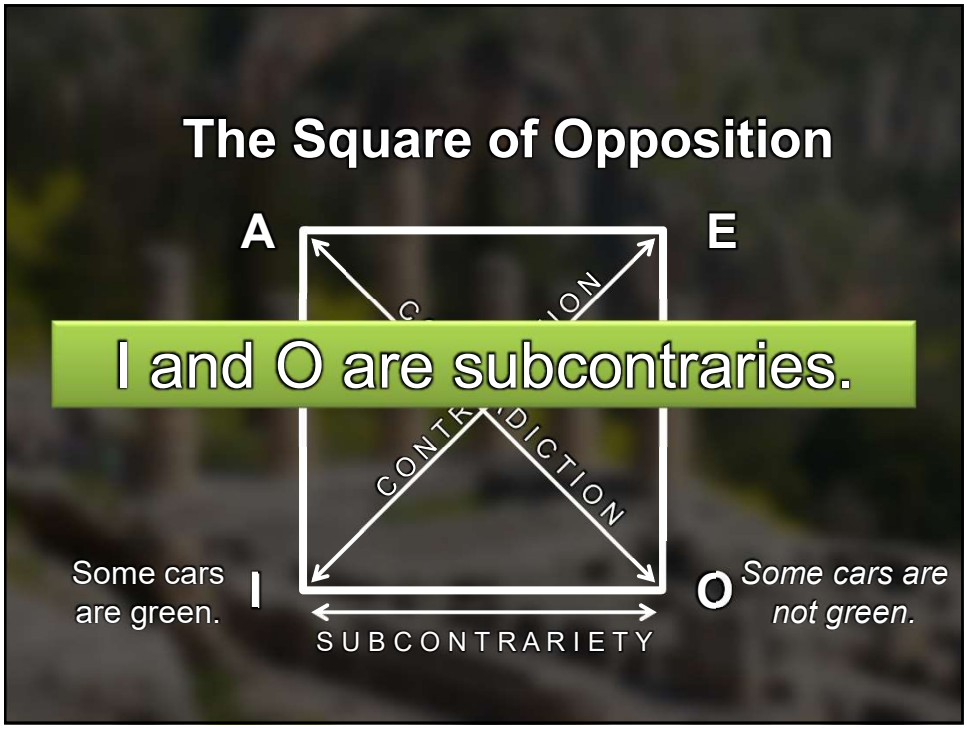
can both be false at the same time

93

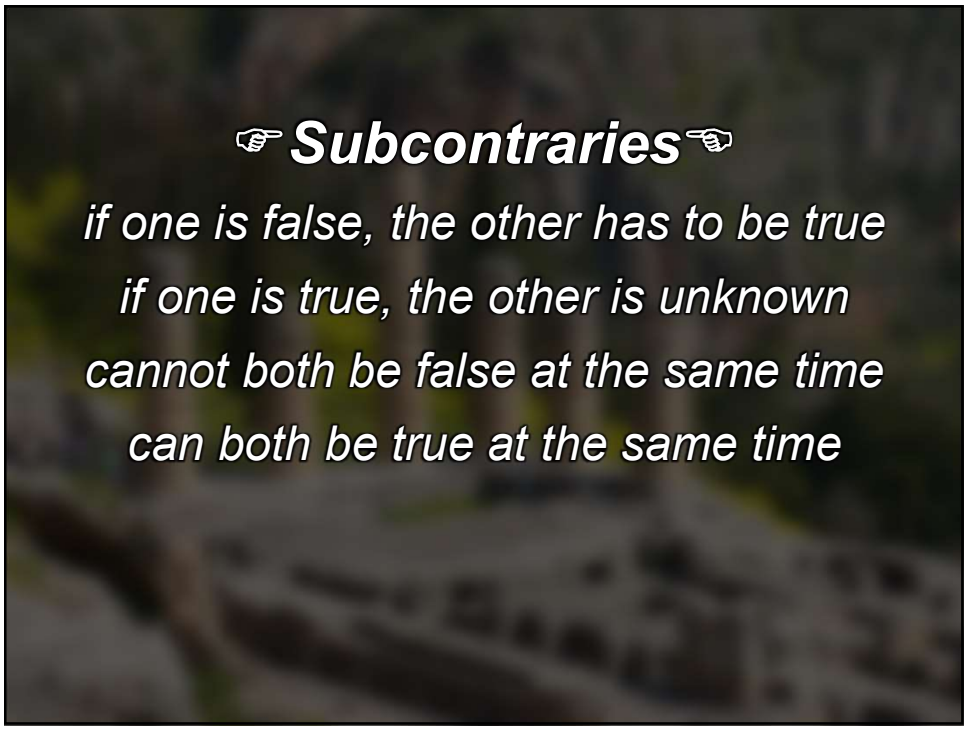
The Square of Opposition



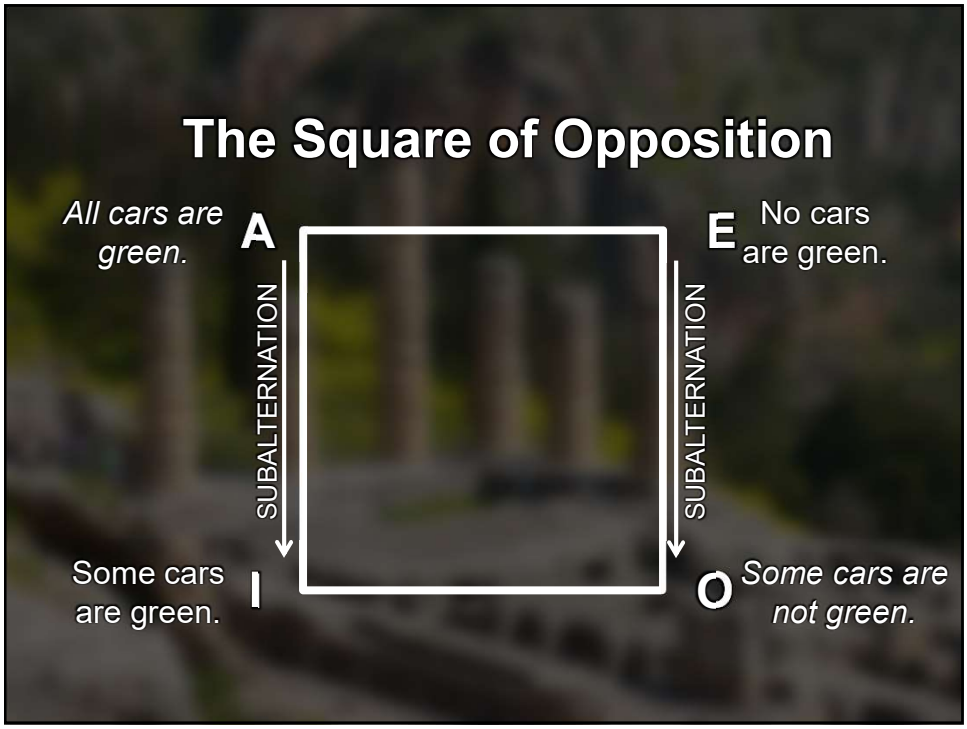
94


The Square of Opposition
A
E
I and O are subcontraries.
CONTRADICTION
Some cars are green.
I
O
Some cars are not green.
SUBCONTRARIETY

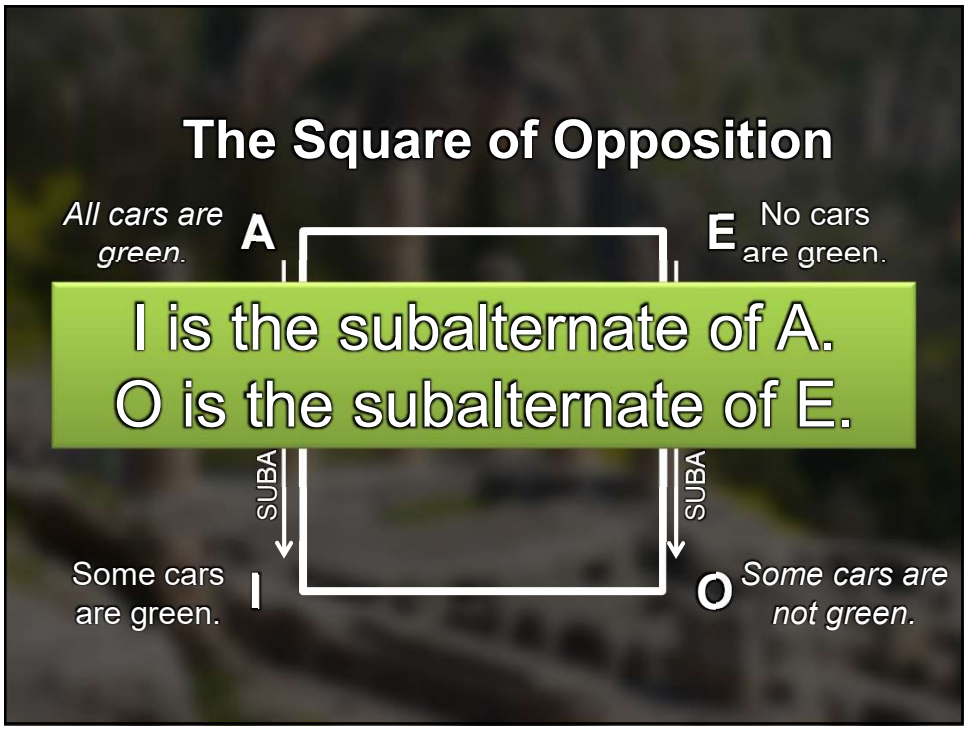
95


☞Subcontraries☜
if one is false, the other has to be true
if one is true, the other is unknown
cannot both be false at the same time
can both be true at the same time

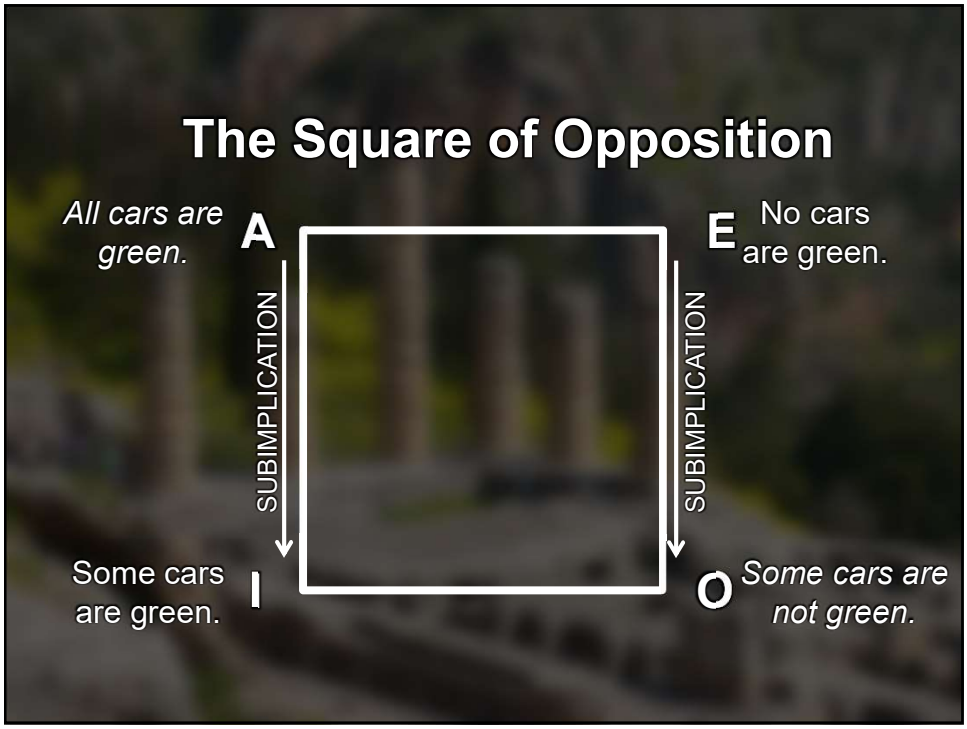
96


The Square of Opposition
All cars are green.
A
E
No cars are green.
SUBALTERNATION
SUBALTERNATION
Some cars are green.
I
O
Some cars are not green.

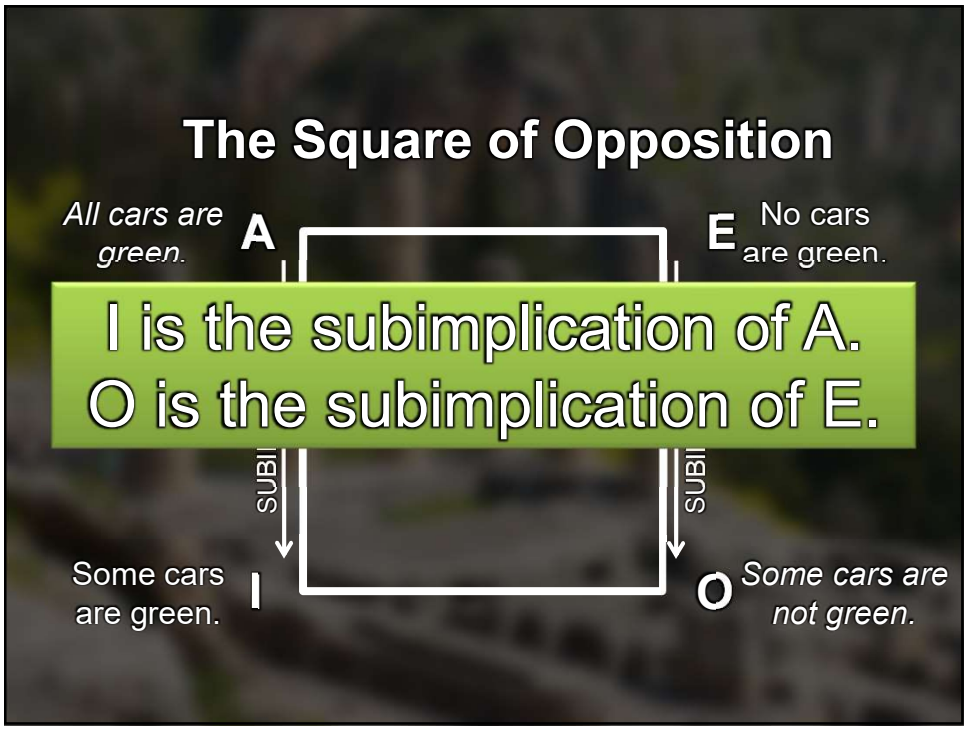
97


The Square of Opposition
All cars are green.
A
E
No cars are green.
I is the subalternate of A.
O is the subalternate of E.
SUBA
SUBA
Some cars are green.
I
O
Some cars are not green.

98


The Square of Opposition
All cars are green.
A
E
No cars are green.
SUBIMPLICATION
SUBIMPLICATION
Some cars are green.
I
O
Some cars are not green.

99


The Square of Opposition
All cars are green.
A
E
No cars are green.
I is the subimplication of A.
O is the subimplication of E.
Some cars are green.
I
O
Some cars are not green.

100

☞Subalternates☜

If A is true, I is true.

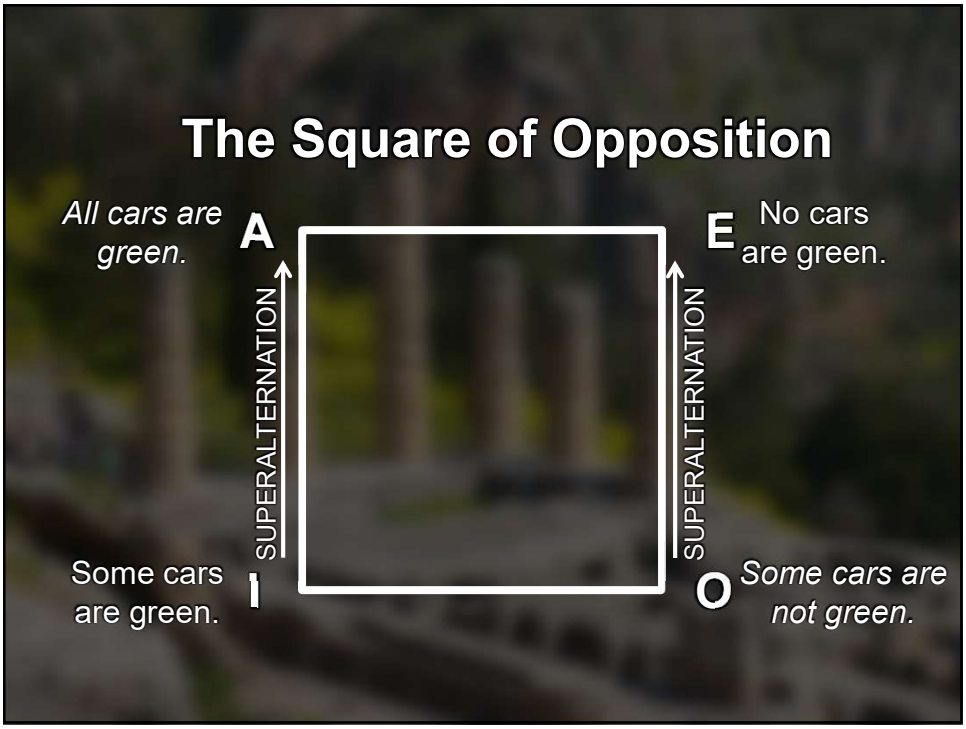
If E is true, O is true.

If A is false, I is unknown.

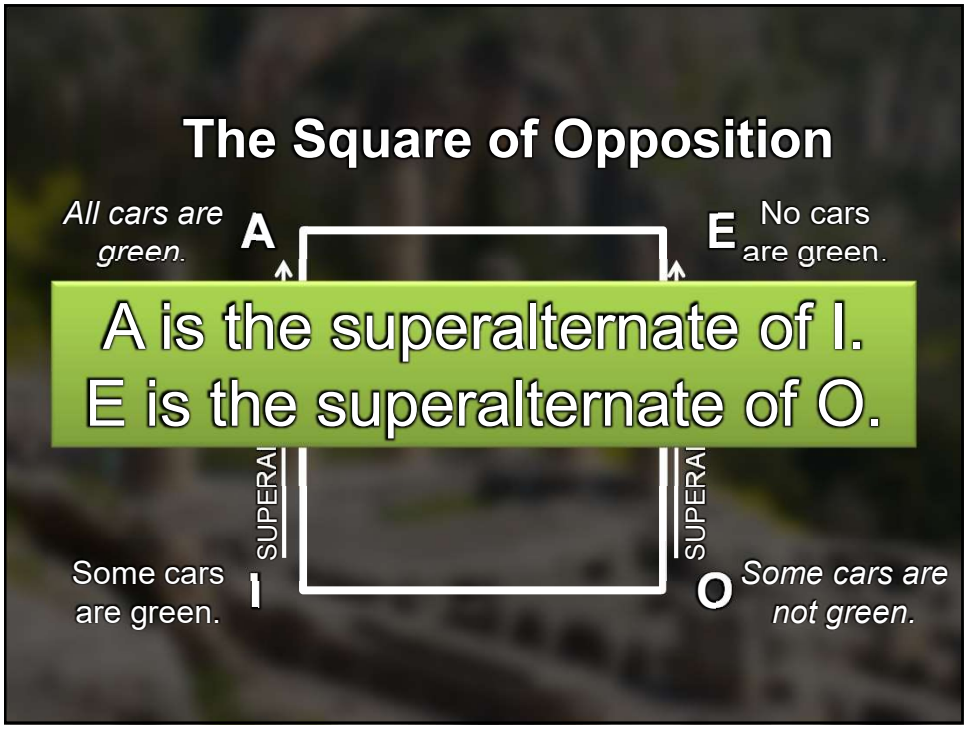
If E if false, O is unknown.

101

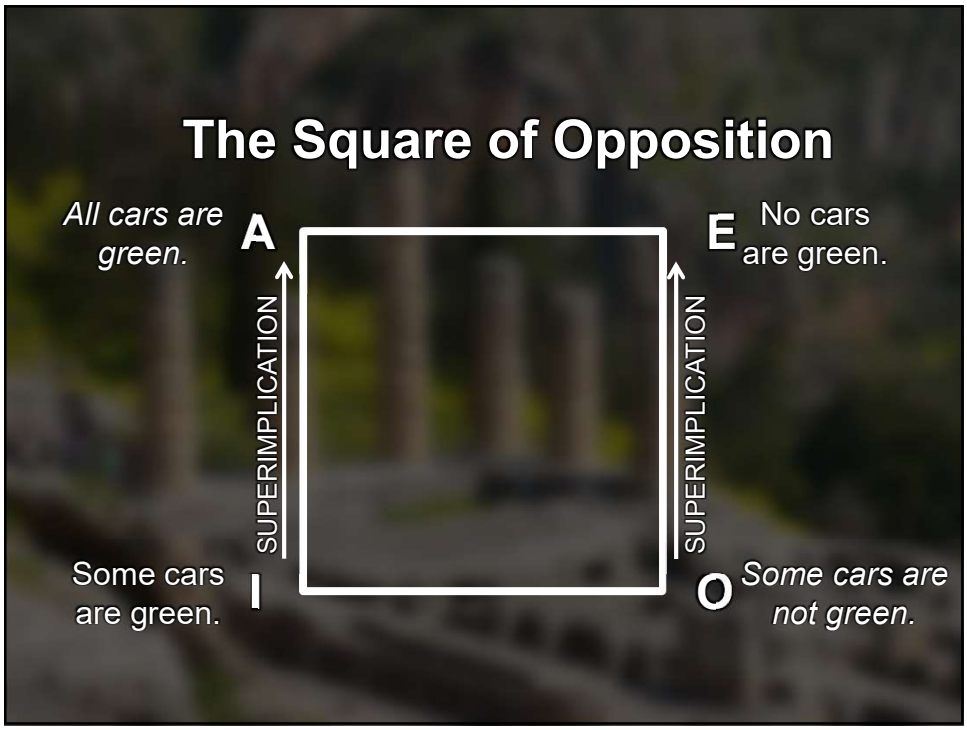
The Square of Opposition



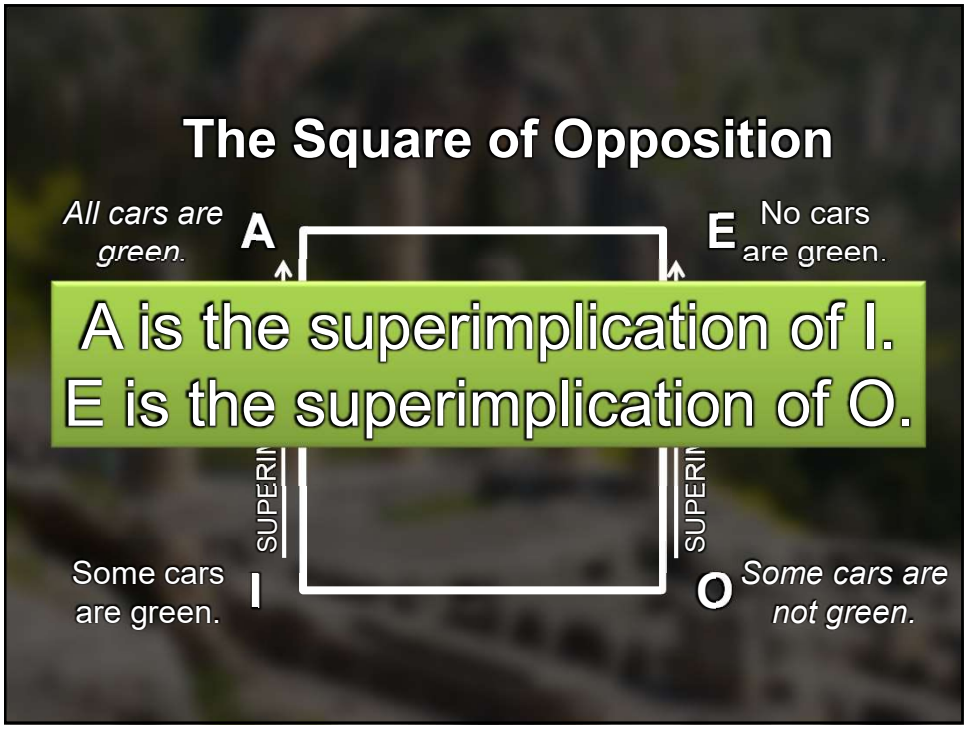
102


The Square of Opposition
All cars are green.
A
E
No cars are green.
A is the superalternate of I.
E is the superalternate of O.
SUPERA
SUPERA
Some cars are green.
I
O
Some cars are not green.

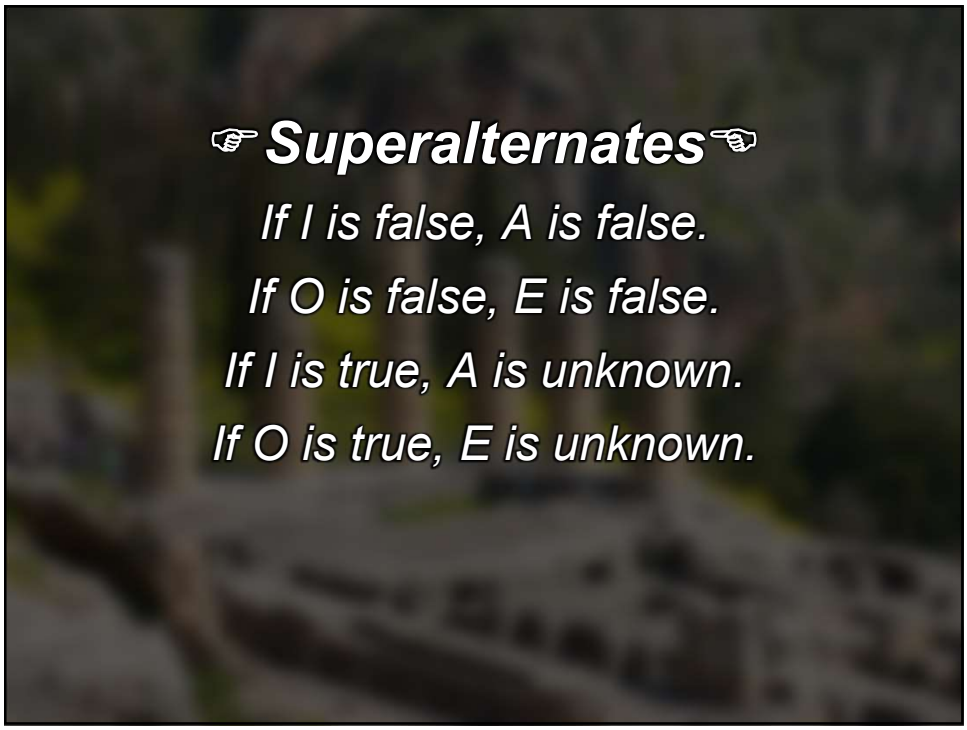
103


The Square of Opposition
All cars are green.
A
E
No cars are green.
SUPERIMPLICATION
SUPERIMPLICATION
Some cars are green.
I
O
Some cars are not green.

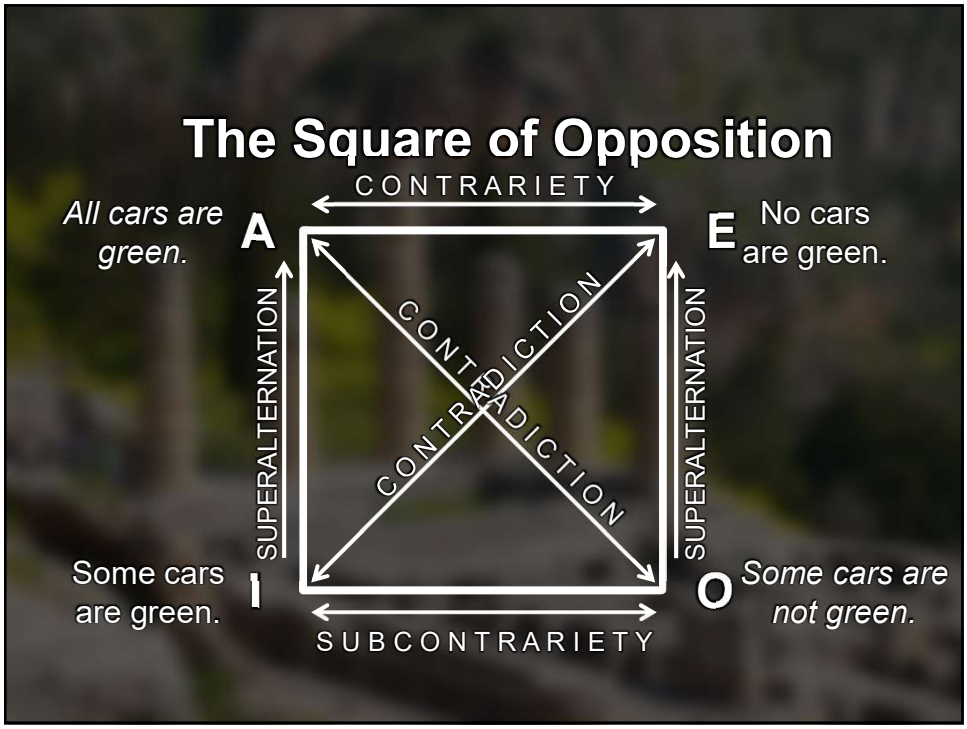
104


The Square of Opposition
All cars are green.
A
E
No cars are green.
A is the superimplication of I.
E is the superimplication of O.
SUPERIM
SUPERIM
Some cars are green.
I
O
Some cars are not green.

105


☞Superalternates☜
If I is false, A is false.
If O is false, E is false.
If I is true, A is unknown.
If O is true, E is unknown.

106


The Square of Opposition
CONTRARIETY
All cars are green.
A
No cars are green.
E
SUPERALTERNATION
CONTRADICTION
CONTRADICTION
SUPERALTERNATION
Some cars are green.
I
O
Some cars are not green.
SUBCONTRARIETY

107

Categorical Logic

108

The most common type of categorical argument (for which Aristotle is famous) is the categorical syllogism

A syllogism is an argument with two premises and a conclusion.

A categorical syllogism is a syllogism composed of all categorical propositions.

109

Parts of the Categorical Syllogism

major premise

contains the major term

minor premise

contains the minor term

conclusion

contains the major term and the minor term but not the middle term

110

Identifying the Parts

- *The major term is the predicate of the conclusion.*
- *The minor term is the subject of the conclusion.*
- *The middle term occurs only once in each premise but does not occur in the conclusion.*

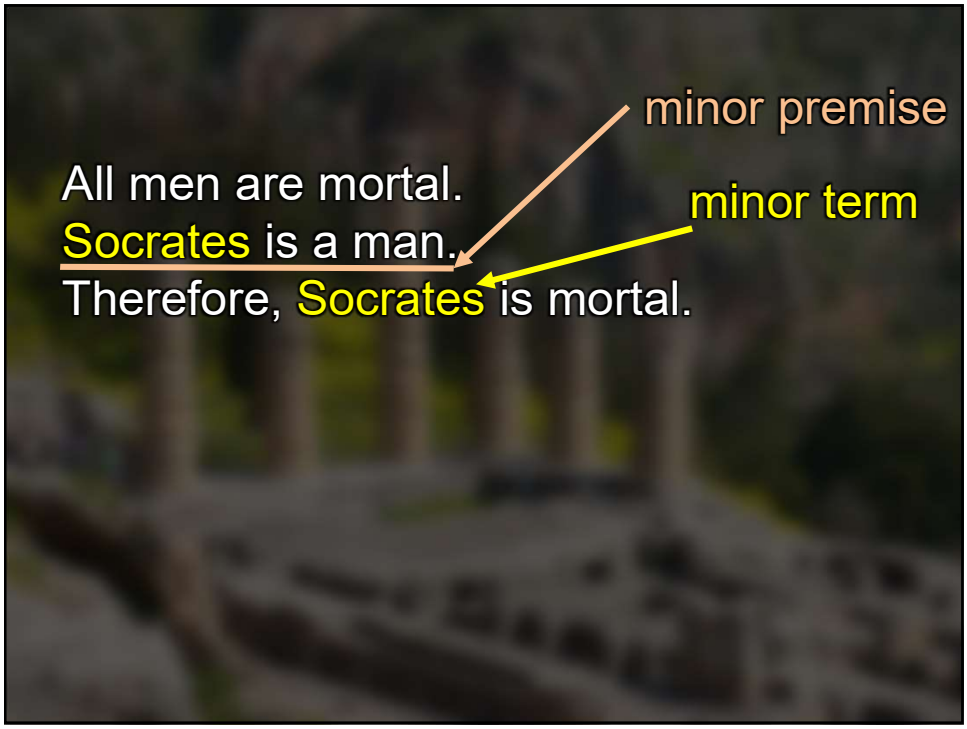
111

major premise

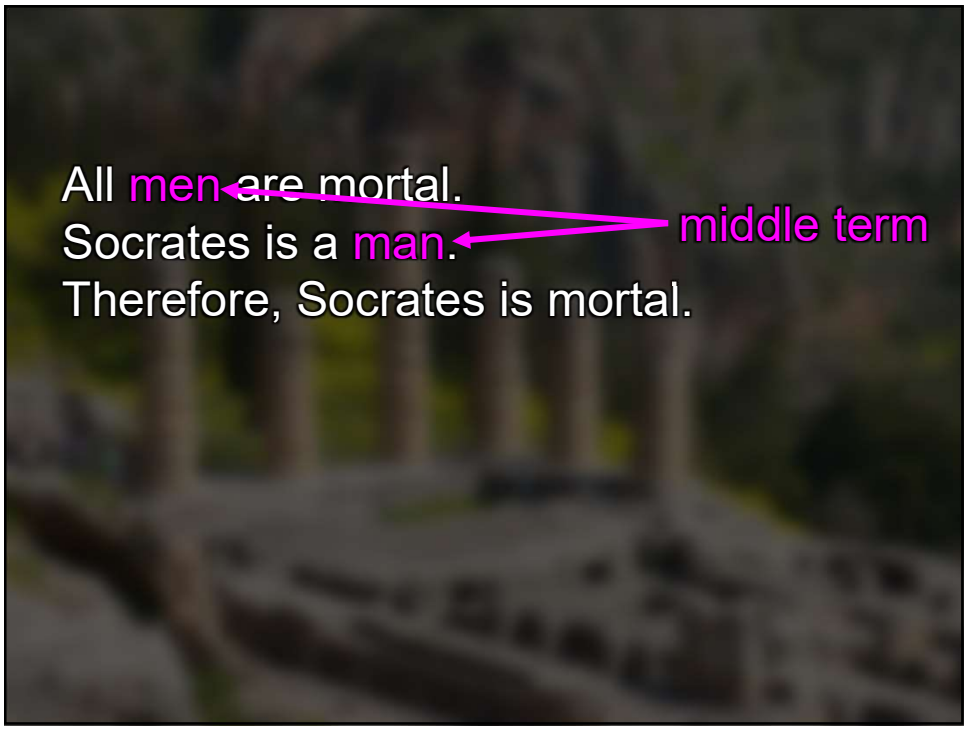
major term

All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.

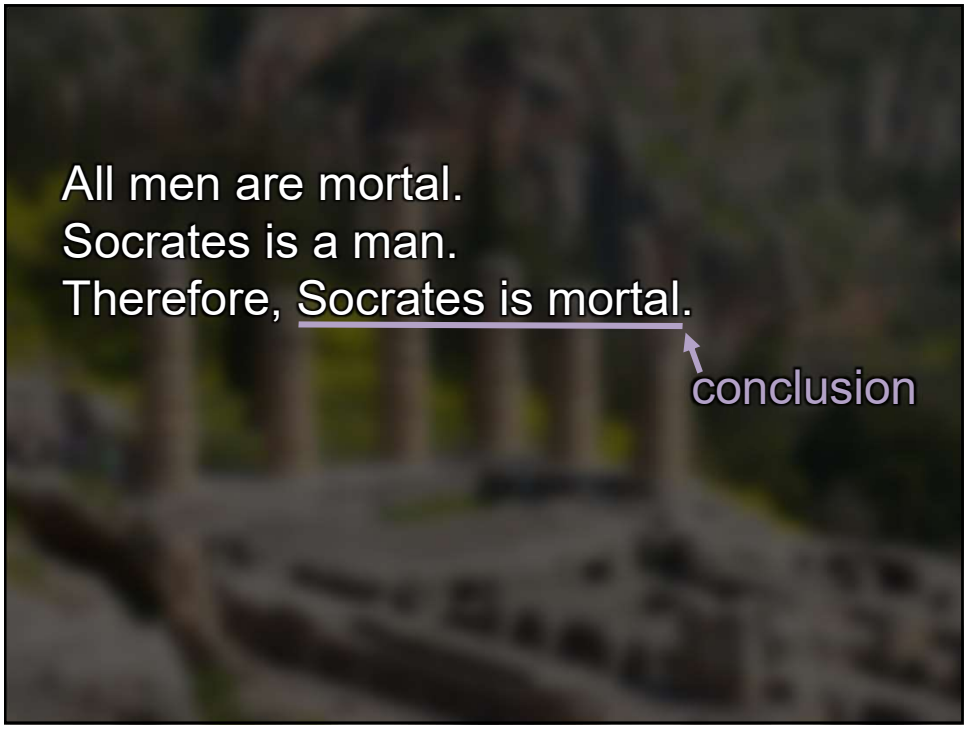
112


minor premise
minor term
All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.

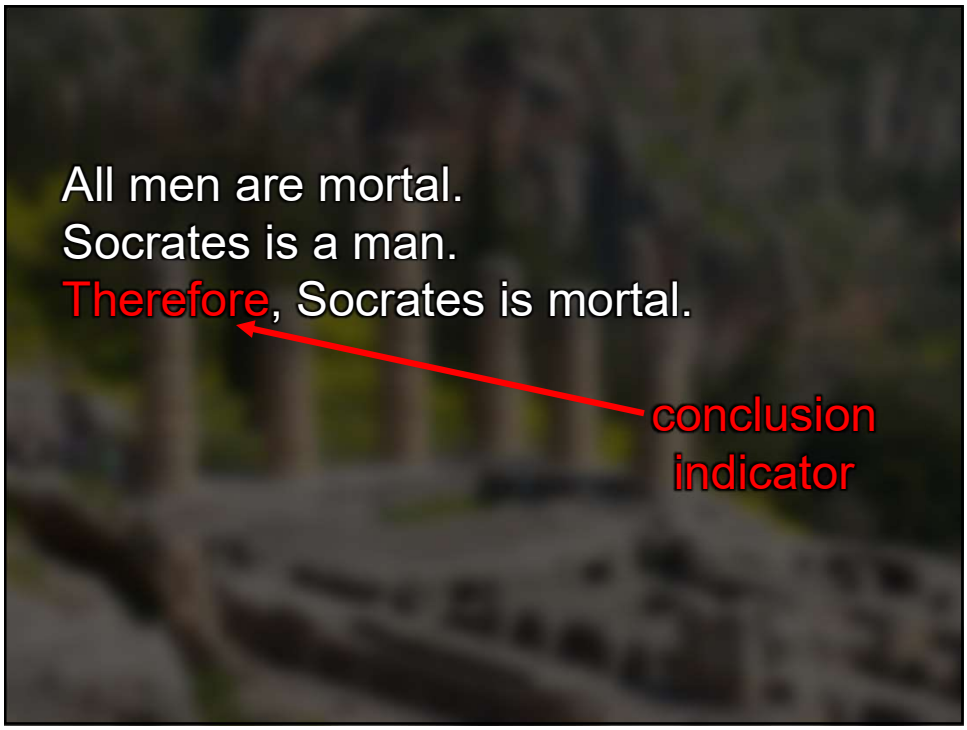
113


All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.
middle term

114


All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.
conclusion

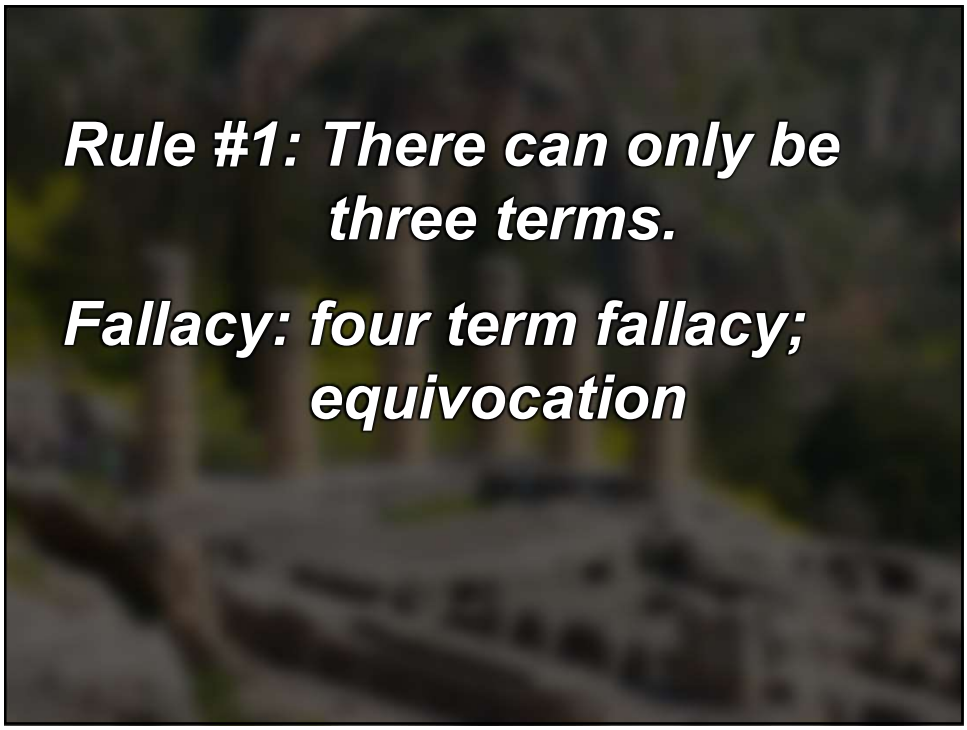
115


All men are mortal.
Socrates is a man.
Therefore, Socrates is mortal.
conclusion
indicator

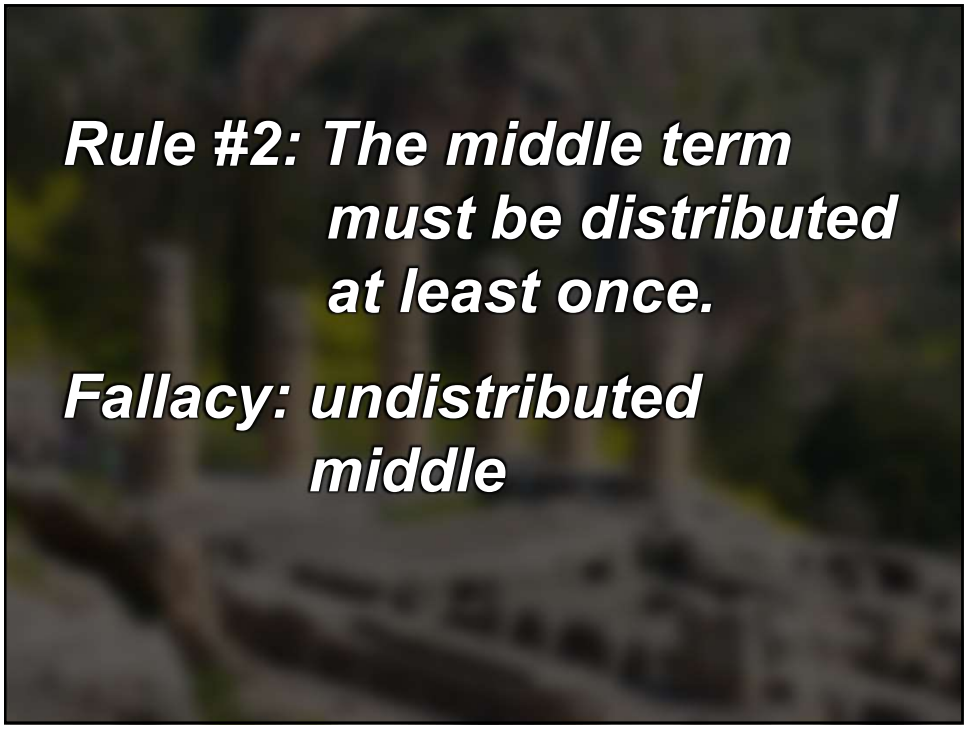
116

Rules for
Valid
Categorical
Syllogism

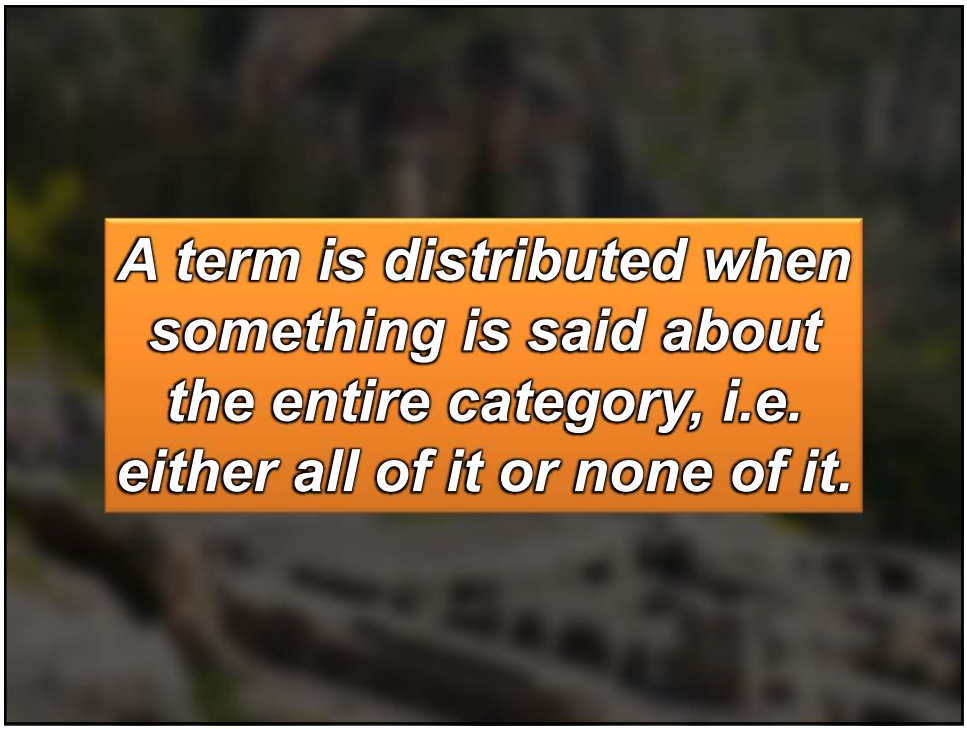
117


Rule #1: There can only be three terms.
Fallacy: four term fallacy; equivocation

118


Rule #2: The middle term must be distributed at least once.
Fallacy: undistributed middle

119


A term is distributed when something is said about the entire category, i.e. either all of it or none of it.

120

Rule #3: If a term is distributed in the conclusion, it must be distributed in its premise.

Fallacy: illicit major / illicit minor

121

Rule #4: If either premise is negative, the conclusion must be negative.

Fallacy: drawing an affirmative conclusion from a negative premise

122

Rule #5: There cannot be two negative premises.

Fallacy: two negative premises

123

Some Ys are not Zs.
No Xs are Ys.
Therefore, some Xs are not Zs.

Some humans are not female.
No monkeys are humans.
Therefore, some monkeys are not female.

No Ys are Zs.
All Xs are Ys.
Therefore, no Xs are Zs.

No amphibians are mammals.
All frogs are amphibians.
Therefore, no frogs are mammals.

124