Introduction to Logical Reasoning

Review #3

Categorical Reasoning

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The Skills You Have Practiced...

1. Diagramming categorical statements,

2. Analyzing categorical statements, and

3. Assessing categorical syllogisms (≈60% of the exam).

Categorical Statements

Be sure to practice taking a categorical statement written in English and identify its categorical structure. You do this by identifying the subject (*S*) and predicate (*P*) terms of the statement, along with that statement's *quantity* (universal or particular), *quality* (affirmative or negative), and *distribution* (distributed or undistributed).

Example

All logic students are good critical thinkers.

Four Standard Forms of Categorical Statements

Universal Positive

A: All *X* is *Y*.

Shade in all of *X* not shared with *Y*.

Universal Negative

E: No *X* is *Y*.

Shade in all of *X* shared with *Y*.

Particular Positive

I: Some *X* is *Y*.

Dot-*x* in *X* shared with *Y*.

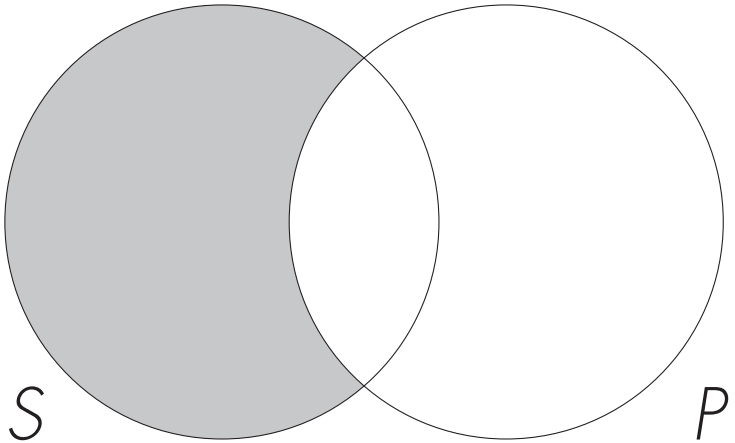
Particular Negative

O: Some *X* is not *Y*.

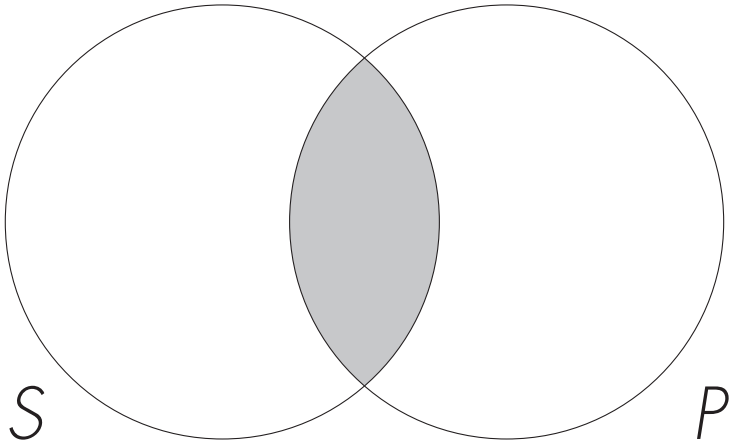
Dot-*x* in *X* not shared with *Y*.

Note: A complement like non-*S* or non-*P* can substitute *X* or *Y*.

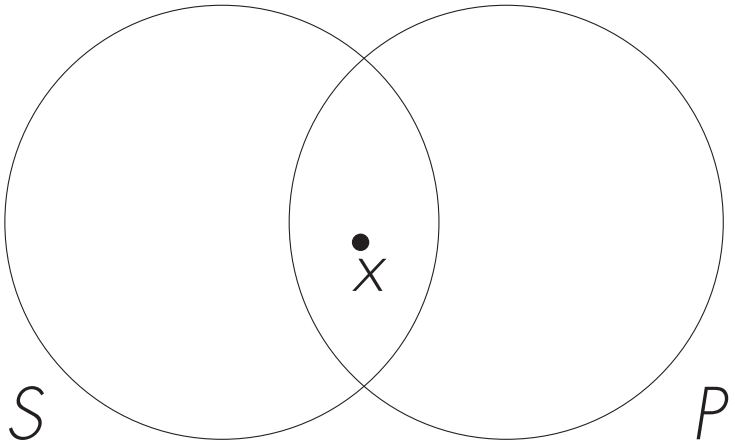
The Basic Forms & Their Diagrams



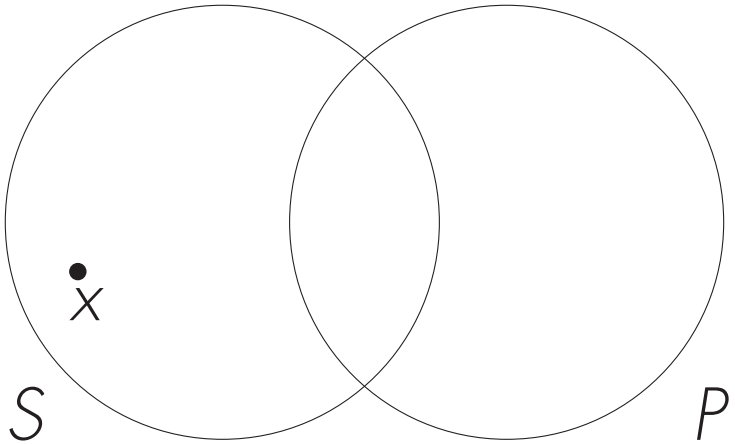
A: All *S* is *P*.



E: No *S* is *P*.



I: Some *S* is *P*.

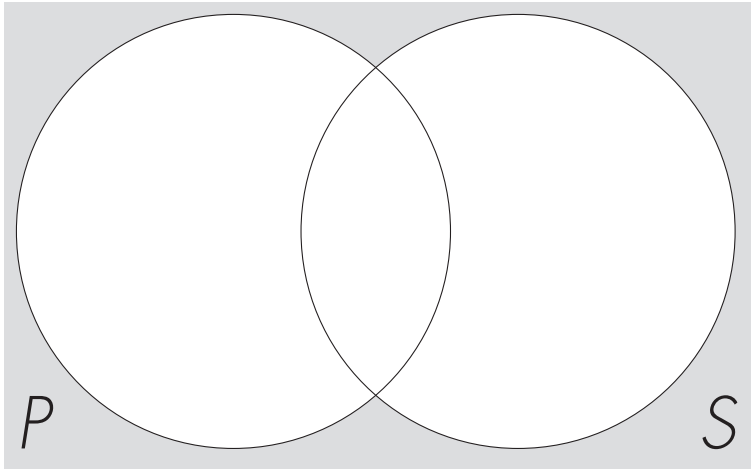


O: Some *S* is not *P*.

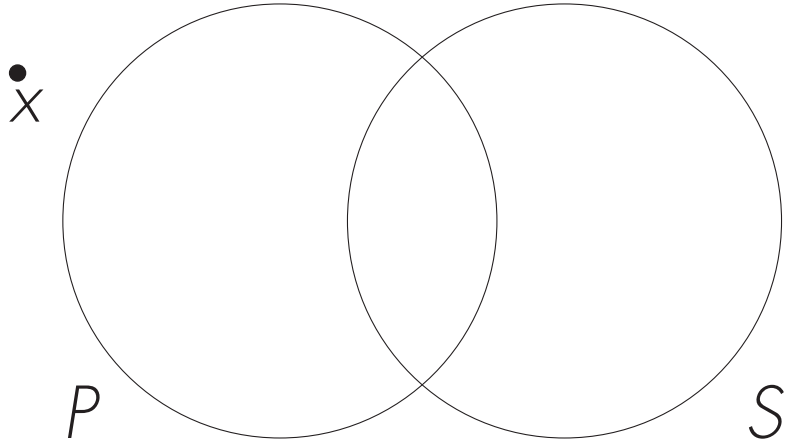
Common Problems

Generally, everyone seems to understand these four basic forms, though be on guard against mixing things up. Beyond that, do review some of the trickier more advanced forms of categorical statements. The ones involving *complements* (i.e., non-*S* and non-*P*) are especially important to remember.

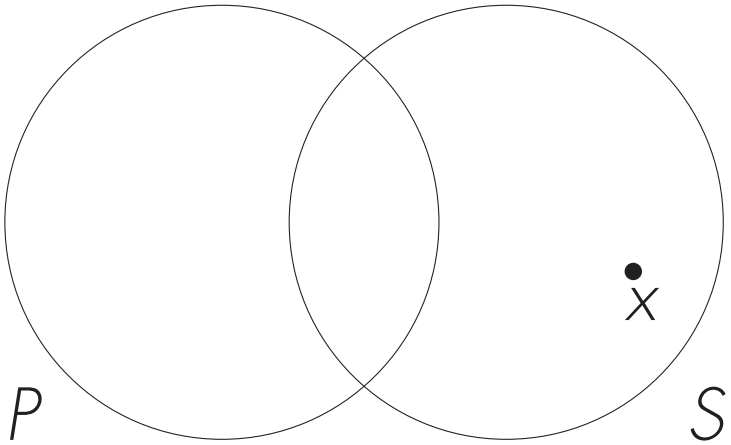
Examples of More Complex Forms & Their Diagrams



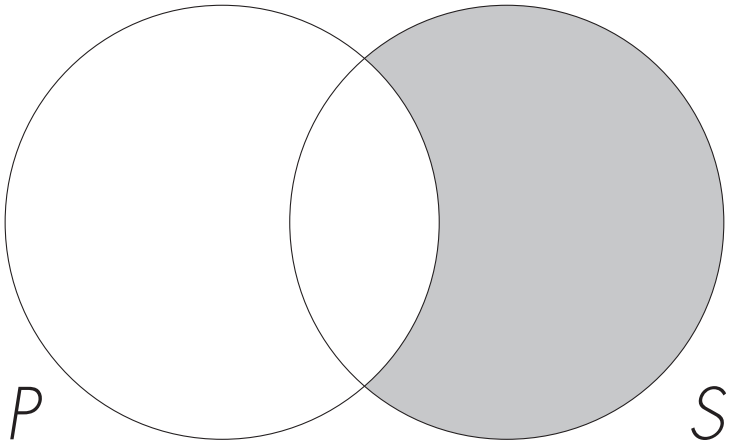
E: No non-*P* is non-*S*.



I: Some non-*P* is non-*S*.



O: Some non-*P* is not non-*S*.



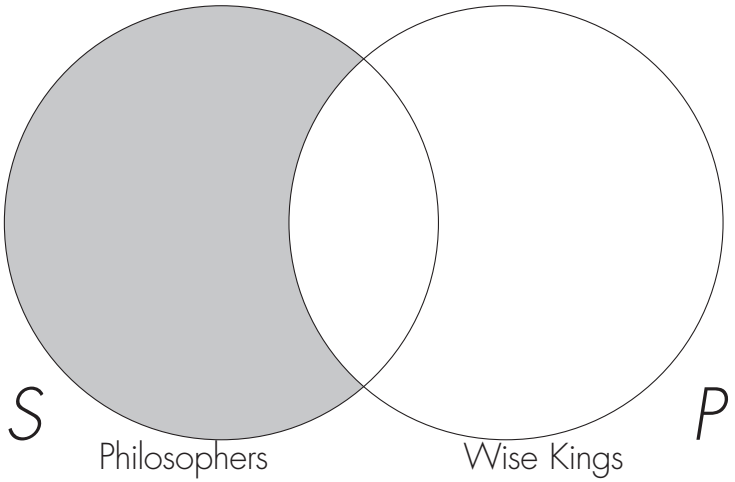
A: All non-*P* is non-*S*.

Common Problems

In addition, do not forget the difference between "the only" and "only". Both establish a universal, affirmative (that is, **A**-type) categorical claim between the two categories, but they do so in quite different ways.

Example

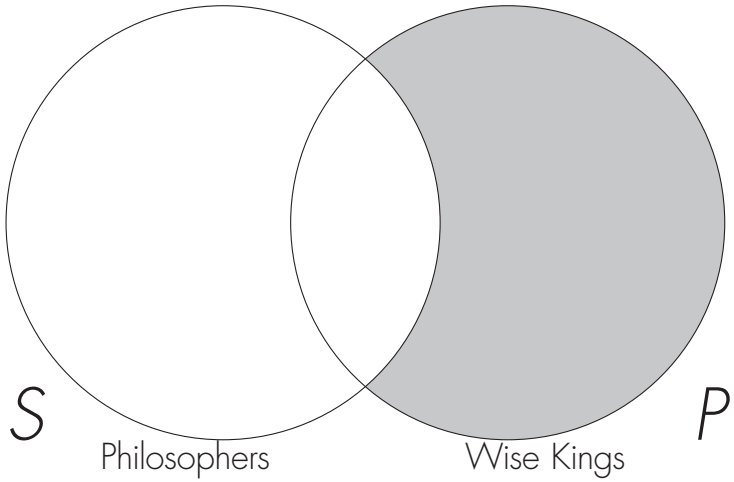
Philosophers are **only** wise kings.



All philosophers are wise kings.
(**A** Statement: All *S* are *P*.)

In this case, philosophers can "only" be one thing: wise kings. So the area of philosophers outside of wise kings must be empty.

Philosophers are **the only** wise kings.



All wise kings are philosophers.
(**A** Statement: All *P* are *S*.)

Meanwhile, over here, "the only" wise kings that you will find are philosophers. So the area of wise kings outside of philosophers must be empty.

Categorical Statement Analysis

Once you have diagrammed a categorical statement, then you can use the truth or falsity of this statement to determine whether you know anything about other categorical statements. We saw this with the square of opposition, along with the operations of conversion, obversion, and contraposition.

Common Problems

Generally people often try to do too much in their heads. Just draw the Venn diagrams for everything. This will make it much easier on you to determine if the truth (or falsity) of one categorical statement tells you whether a second categorical statement is true, false, or unknown. But do not forget to write down a clear and succinct explanation!

Example

Suppose that the following statement is true:

> All logic students are good critical thinkers.

Is the following statement true, false, or unknown?

> No non-good critical thinkers are non-logic students.

Assessing Categorical Syllogisms

Remember that a categorical syllogism will always involve only *three* statements: two premises and a conclusion. The task is to (1) identify the major (*P*), minor (*S*), and middle (*M*) terms, (2) put the argument into standard symbolic form (being sure to number the premises correctly), (3) diagram the premises, (4) diagram the conclusions, and (5) finally use the two diagrams to see whether the premises provide the needed support for the conclusion.

Common Problems

The most common problems are (1) not shading in areas correctly and (2) not being sure when the dot goes on a line or not. Furthermore, be sure to draw the conclusion's Venn diagram separately, so you can check it against the premises more easily.

Example

All logic students are hard workers, and so all logic students are good critical thinkers because some hard workers are good critical thinkers.

Next Class...

Exam #3 will begin promptly at 3:30PM in **lecture hall 1202**. Please show up and be seated by that time.

Be aware that you will be asked to put anything you bring (including cell phone) in the aisle or the back of the room. You will *not* be able to leave the room until you finish the exam. Plan accordingly. Pencils, scratch paper, and 

will be available.

Quiz #11 will be graded tonight and available for pickup tomorrow.

Otherwise, please do not forget to turn in your response to the Review Session #3 Questionnaire on your way out.