## **Introduction to Logical Reasoning**

## Workshop #10: Inferences with Categorical Statements (Solutions)

Part I: Assume that the following categorical statement is true:

All philosophers are logicians.

Draw the Venn diagram representing this statement, being sure to label its subject (S) and predicate (P) terms:



Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

Now given the truth of this Venn diagram, what can you infer about each of the categorical statements listed below? That is, is each true, false, or unknown? Use a Venn diagram to justify each of your answers. You may assume that neither the subject (*S*) nor the predicate (*P*) term is empty. These should be fairly straightforward to answer.

1. All logicians are philosophers.



Logicians Philosophers 2. Some philosophers are not logicians.



PhilosophersLogicians3.No philosophers are logicians.



Philosophers Logicians 4. Some philosophers are logicians.



Philosophers Logicians5. Some logicians are philosophers.



This is *unknown*. [2] The original statement only tells us that the area of *S* outside of *P* is empty; it does not give us enough information to know whether the area of *P* outside of *S* is empty or not. So it is unknown whether statement 1 is true or false. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

This is *false*. [2] The original statement tells us that the area of *S* outside of *P* is empty, whereas statement 2 says there *is* something in that area. So statement 2 cannot be true. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

## This is *false*. [2] The original statement tells us that the area of *S* outside of *P* is empty, and since there must be an *S* somewhere, there must be something in the area of overlap between *S* and *P*. So statement 3 cannot be true because it claims that area is empty. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

This is *true*. [2] The original statement tells us that the area of *S* outside of *P* is empty, and since there must be an *S* somewhere, there must be something in the area of overlap between *S* and *P*. So statement 4 is true because it claims there is something in that area. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

This is *true*. [2] The original statement tells us that the area of *S* outside of *P* is empty, and since there must be an *S* somewhere, there must be something in the area of overlap between *S* and *P*. So statement 5 is true because it claims there is something in that area. [5]

Diagram with parts labelled [10]. Following directions please contribute mistakes [1].

## Workshop #10: Inferences with Categorical Statements (Solutions)

Part II: Assume that the following categorical statement is true:

Some journalists are mediocre hacks.





Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1]. Now given the truth of this Venn diagram, what can you infer about each of the categorical statements listed below? That is, is each true, false, or unknown? Use a Venn diagram to justify each of your answers. You may assume that neither the subject (S) nor the predicate (P) term is empty. Some of these may require a little more thought.

1. Some journalists are not non-mediocre hacks.



This is *true*. [2] The original statement tells us that there is something in the area of overlap between *S* and *P*, and statement 1 says the exact same thing. So statement 1 is true. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

2. Some non-mediocre hacks are journalists.



3. Some non-journalists are non-mediocre hacks.



4. All non-mediocre hacks are journalists.



This is *unknown*. [2] The original statement tells us that there is something in the area of overlap between *S* and *P*; it does not give us enough information to know whether the area of *S* outside of *P* has something or not. So it is unknown whether statement 2 is true or false. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

This is *unknown*. [2] The original statement tells us that there is something in the area of overlap between *S* and *P*; it does not give us enough information to know whether the area outside of both *S* and *P* has something or not. So it is unknown whether statement 3 is true or false. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].

This is *unknown*. [2] The original statement tells us that there is something in the area of overlap between S and P; it does not give us enough information to know whether the area outside of both S and P is empty or not. So it is unknown whether statement 4 is true or false. [5]

Diagram with parts labelled [10]. Following directions [1]. No other mistakes [1].