Introduction to Logical Reasoning

Workshop #11: Assessing Categorical Statements (Solutions)

Part I: Each of the following problems presents a categorical syllogism in standard symbolic form. For each of these syllogisms, (1) state the formal identification of the syllogism's form and (2) use Venn diagrams of the premises and the conclusion to determine whether the syllogism is valid or invalid.

- 1. No *P* is *M*. 1.
 - 2. All *S* is *M*.
 - \therefore No S is P.

Venn diagram of the premises [15]:



Venn diagram of the conclusion [10]:



2. 1. Some *M* is not *P*.

2. Some S is M.

.:. Some S is P.





Venn diagram of the conclusion [10]:



- 3. 1. No *P* is *M*.
 - 2. Some *M* is *S*.

: Some S is not P. Venn diagram of the premises [15]:



Venn diagram of the conclusion [10]:



This syllogism is *valid*. [2] [Its form **EAE-2** is *Cesare*.] This is because the conclusion requires that the area of overlap between *S* and *P* be empty (the conclusion diagram has it shaded in). Looking at the premises' diagram, that area of overlap is indeed empty (the premises diagram also has it shaded in). So assuming the truth of the premises means that the conclusion is true as well, making this valid. [5]

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Following directions [1]. No other mistakes [1].

This syllogism is *invalid*. [2] This is because the conclusion requires that there be something (the dot-*x* in the conclusion diagram) in area of overlap between S and P. Looking at the premises' diagram, we do not know for sure whether there is something in that area of overlap (the premises diagram's dot-y may be in that area, but we cannot be sure). So assuming the truth of the premises does not mean that the conclusion must be true, making this invalid. [5]

Following directions [1]. No other mistakes [1].

This syllogism is *valid*. [2] [Its form EIO-4 is *Fresison*.] This is because the conclusion requires that there be something (the dot-*x* in the conclusion diagram) the area of *S* outside P. Looking at the premises' diagram, that area indeed has something in it (the premises diagram's dot-*x*). So assuming the truth of the premises means that the conclusion is true as well, making this valid. [5]

Following directions [1]. No other mistakes [1].

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Part II: Each of the following problems presents a categorical syllogism. For each of these syllogisms: (1) identify the major term (*P*), the minor term (*S*), and the middle term (*M*); (2) put the syllogism into standard symbolic form; (3) state the formal identification of the syllogism's form; and (4) use Venn diagrams of the premises and the conclusion to explain whether the syllogism is valid or invalid.

1. Some investigative journalists are not courageous people, for all social and political activists are investigative journalists, and some social and political activists are not courageous people.

Major Term (*P*): Courageous people. [2] Minor Term (*S*): Investigative journalists. [2] Middle Term (*M*): Social and political activists. [2]

Standard Symbolic Form [1]:

- 1. Some *M* is not *P*. [2]
- 2. All *M* is *S*. [2]
- .:. Some S is not P. [2]

Venn diagram of the premises [15]:



Venn diagram of the conclusion [10]:



This syllogism is *valid*. [2] [Its form **OAO-3** is *Bokardo*.] This is because the conclusion requires that there be something (the dot-*x* in the conclusion diagram) in the area of *S* outside *P*. Looking at the premises' diagram, that area indeed has something in it (the premises diagram's dot-*x*). So assuming the truth of the premises means that the conclusion is true as well, making this valid. [5]

Following directions [1]. No other mistakes [1].

 All roses are flowers, and some flowers fade quickly. Therefore, some roses fade quickly. Major Term (*P*): Things that fade quickly. [2] Minor Term (*S*): Roses. [2] Middle Term (*M*): Flowers. [2]

Standard Symbolic Form [1]:

- 1. Some *M* is *P*. [2]
- 2. All *S* is *M*. [2]
- .:. Some *S* is *P*. [2]

Venn diagram of the premises [15]:



Venn diagram of the conclusion [10]:



This syllogism is *invalid*. [2] This is because the conclusion requires that there be something (the dot-*x* in the conclusion diagram) in the area of overlap between *S* and *P*. Looking at the premises' diagram, we do not know for sure whether there is something in that area of overlap (the premises diagram's dot-*x may* be in that area, but we cannot be sure). So assuming the truth of the premises does not mean that the conclusion must be true, making this invalid. [5]

Following directions [1]. No other mistakes [1].