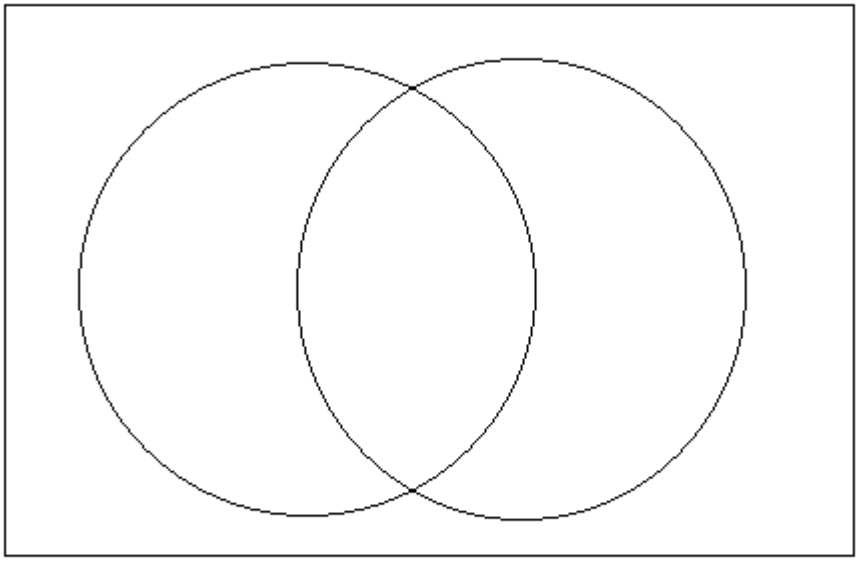
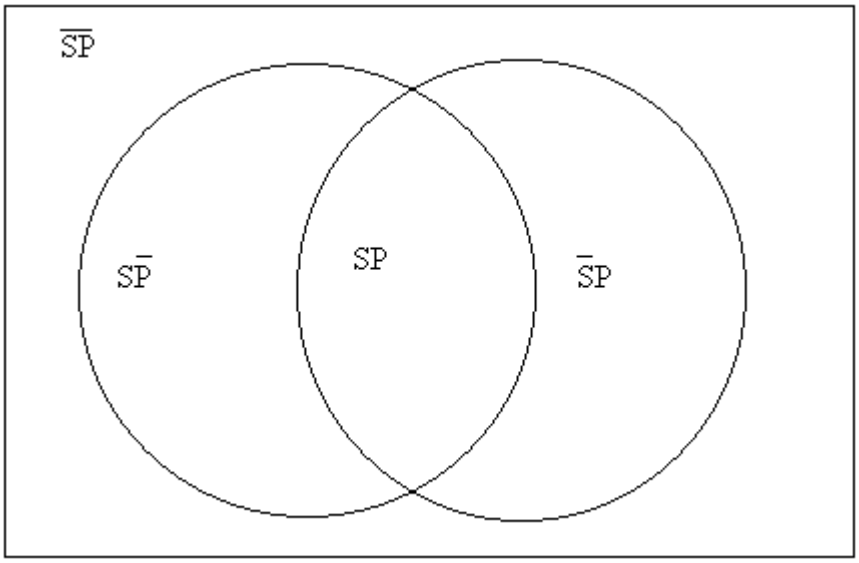
Venn Diagrams of Categorical Statements

The relation between the subject and predicate classes of categorical statements can be represented by Venn diagrams. A Venn diagram for one categorical statement consists of two interlocking circles placed in a box.



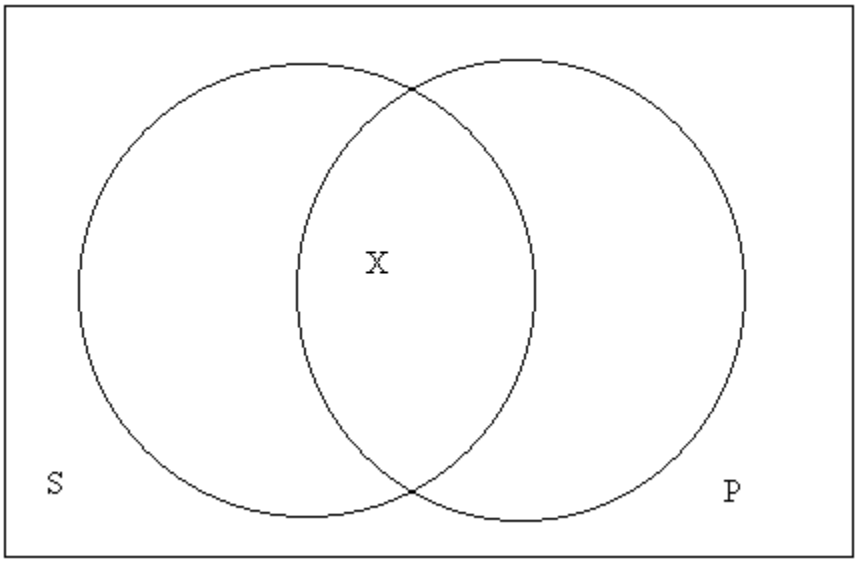
The box, including the circles, represents the universe of discourse. The circle on the left represents the subject class; the circle on the right represents the predicate class.

In the diagram, we can designate the complement of a class by placing a bar, "$\bar{\ }$," over the letter designating the class. Thus the areas of the diagram can be defined as below.



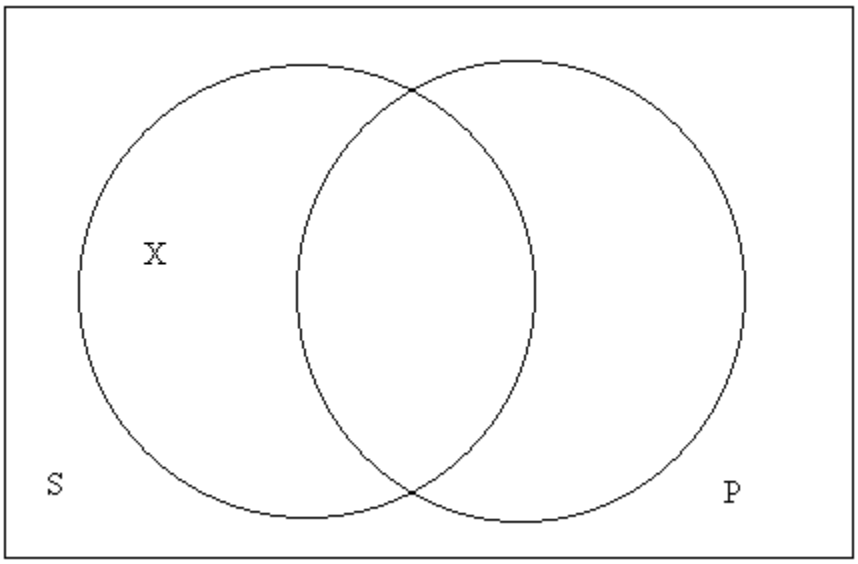
The area in the box that is outside both circles includes everything that is neither an S nor a P. The left-most portion of the two circles includes everything that is an S but is not a P. The right-most portion of the two circles contains everything that is a P but not an S.

Particular categorical statements can be interpreted as asserting that some portion of the diagram has at least one member. Membership is indicated by placing an "X" in the area that has at least one member. The I form categorical form asserts that the area which is both S and P has at least one member. The diagram for the I form is given below.

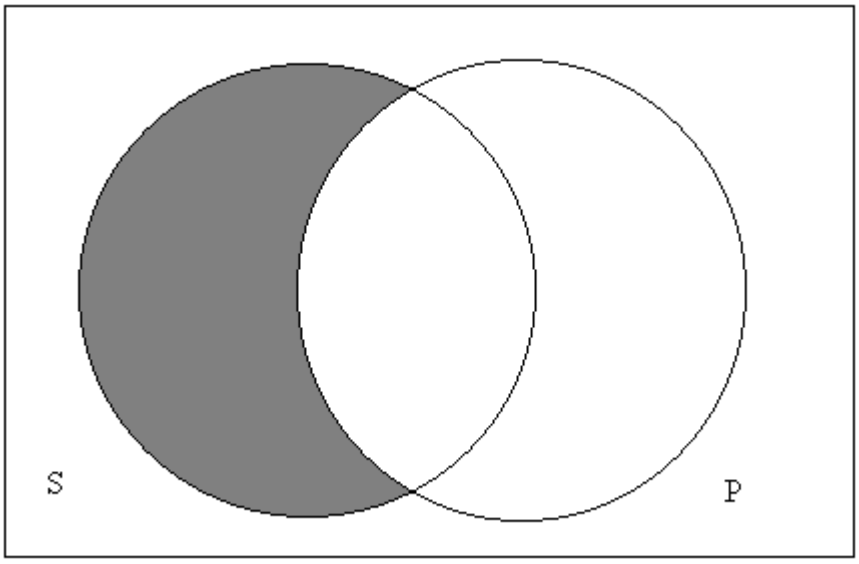


We have labeled the S and P circles for clarity. You should label them this

way in your diagrams. The X in the lens indicates that there is at least one S that is also a P.
Here is the diagram for an O form statement.

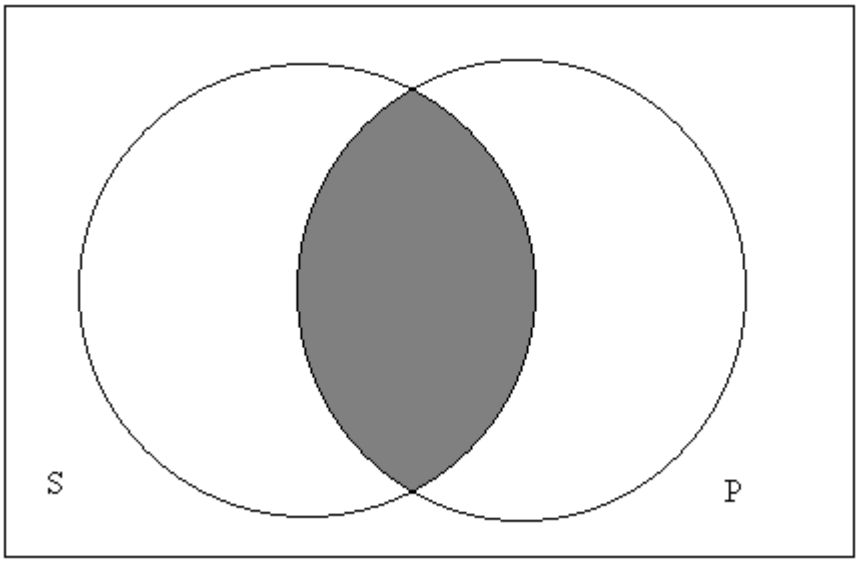


The X in the left-most portion indicates there is at least one S that is not a P.
Universal statements are interpreted as asserting that some portion of the diagram is empty, or has no membership. Lack of membership is indicated by shading an area out.
Here is the diagram for the A form categorical statement.



The shading of the left-most portion indicates that all the S's must be within

the P circle.
Below is the diagram for the E form.



The shaded lens indicates that there are no common members between the S's and the P's.

Exercise 11.1

1. Use the Venn diagrams to explain the logical equivalences of obversion, conversion, and contraposition.

2. None of the implications defined on the traditional square of opposition, except the contradictories, hold given the Venn diagram interpretations of the the four categorical forms. Explain why.