

STUDY NOTES BY DAS SIR KOLKATA (09038870684)

SYLLOGISM BY DAS SIR

THIS STUDY NOTE ON REASONING SYLLOGISM BY VENN DIAGRAM METHOD IS CREATED BY DAS SIR WHO PREPARES STUDENTS FOR ALL SORTS OF GOVERNMENT JOB EXAMS LIKE IBPS RRB/SSC CGL/IBPS PO/SBI PO/MAT/CLAT/CDS/HOTEL MANAGEMENT NCHMCT JEE/ONGC GT/SAIL MT/CIL MT/POSTAL ASSISTANT /ALL PSU ETC.

YOU CAN GET IN TOUCH WITH HIM FOR STUDY NOTES OR PERSONAL COACHING IN KOLKATA ON 09038870684

A syllogism is a form of deductive reasoning consisting of a major premise, a minor premise, and a conclusion. When one makes a conclusion from a general statement or premise and forms a specific conclusion, it takes the form of deductive reasoning, as the specific conclusion is deduced from the general statement.

For example, All mangos are yellow, the major premise, I am a mango, the minor premise, therefore, I am yellow, the conclusion.

One should take note of the fact that in syllogisms, the objects in consideration in a particular problem, and their relation with each other, do not necessarily have to make sense, and do not necessarily have to be accepted as truths. One has to just proceed with the blind assumption that what is given in the question is true. For eg:

All cats are mice.
Some mice are chairs.

In the above example, it is obvious that all cats are not mice, and that mice cannot be chairs. However for the purpose of solving the question, these facts must be assumed to be true. This is just to test your ability to reason things out, and see them from a logical perspective, without actually making factual sense.

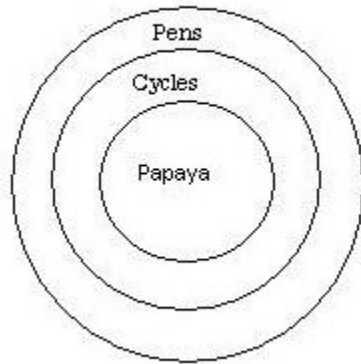
Syllogisms can be solved in many ways, the most frequently used method being Venn diagrams. Venn diagrams show all possible and hypothetically logical relations between a collection of finite and infinite statements. In case of an overlap of the diagrams, it means that an object comes under two or more categories of statements. Here are a few examples to illustrate the above:

FOR STUDY MATERIAL & COACHING CONTACT DAS SIR IN KOLKATA AT 09038870684.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)

1. All papayas are cycles.
All cycles are pens.

- a. All cycles are papayas.
- b. All papayas are pens.
- c. All pens are cycles.
- d. All pens are papayas.



Ans. The correct answer is 'b'.

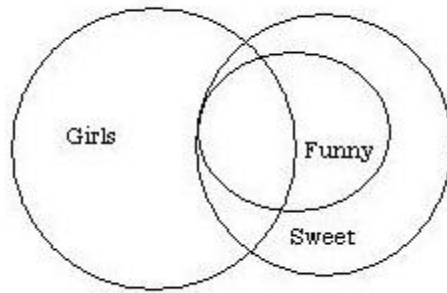
In the above example, it is given that all papayas are cycles, implying that papayas are a subset of cycles. Hence the circle representing papayas is enclosed within that representing cycles. The same holds good for cycles and pens. Thus, from this we can conclude that the collection of pens is the biggest set, implying that all papayas are pens, and all cycles are pens. However, all cycles are not papayas, all pens are not papayas and all pens are not cycles.

2. Some girls are funny.
All funny are sweet.

- a. All girls are sweet.
- b. All sweet are funny.
- c. Some girls are sweet.
- d. All sweet are not funny.

Ans. The correct answer is 'c'.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)



Here, it says that some girls are funny. Hence the circle representing girls and that representing funny overlap at some point. Also, all funny are sweet. Hence the circle representing funny is completely enclosed in the circle representing sweet. Note that consequently, the circle representing funny and that representing girls overlap as well.

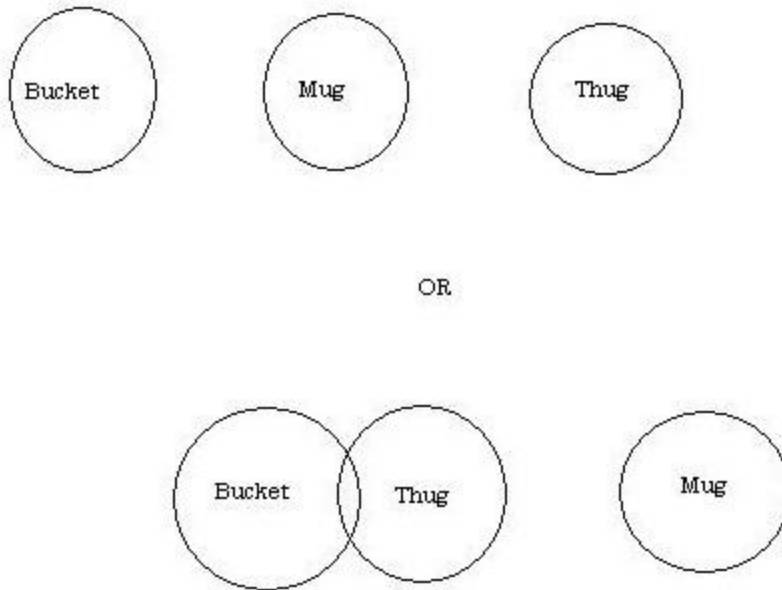
Disputing the options, it is clear that all girls are not sweet. Also note that it cannot be conclusively said that all funny are sweet or all funny are NOT sweet. A conclusion on this point cannot be reached with the given information as 'all funny are sweet' can mean that 'funny' is a subset of 'sweet', or that 'funny' and 'sweet' are completely overlapping sets.

3. No bucket is a mug.
No mug is a thug.

- a. Some buckets are mugs.
- b. All thugs are mugs.
- c. No bucket is a thug.
- d. No mug is a bucket.

Ans. The correct answer is 'd'.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)



Here, no bucket is a mug. Hence the intersection between the bucket set and the mug set is a null set, i.e. there is no common point of intersection between the two. Also no mug is a thug. Hence the intersection between these two sets is a null set as well. From these two statements, there are two possible conclusions. That:

- a. the intersection of the bucket set and the thug set is a null set. (As depicted in Fig.1)
- b. there is an overlapping area between the bucket set and the thug set.(As depicted in Fig.2)

However, since neither of the above conclusions can be positively assumed to be true, both have to be taken into consideration.

Disputing the options, we cannot conclusively say that no bucket is a thug. Clearly, all thugs are not mugs, and no bucket is a mug and vice-versa. Hence option 'd' is the correct answer.

4. Some jackfruits are lilies.
No lily is a canoe.
All canoes are oceans.

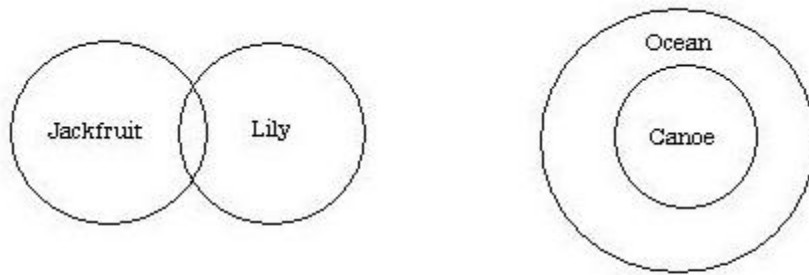
Conclusions:

- a. Some jackfruits are oceans.
- b. Some oceans are canoes.
- c. Some oceans are jackfruits.
- d. Some lilies are jackfruits.

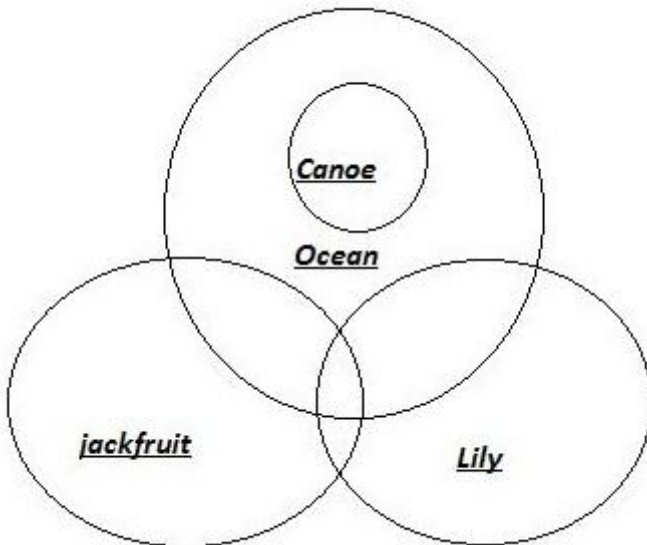
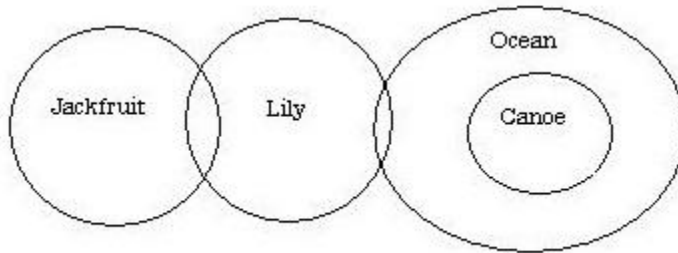
1. Only a and c follow.
2. Only b and c follow.
3. Only b and d follow.
4. All follow.

Ans. The correct answer is '4'.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)



OR



Some jackfruits are lilies. Hence the jackfruit set and lily set partially overlap. Note that when the word 'some' is used, it includes in it, the possibility of 'all' as well. This means that another possibility is that the jackfruit set and the lily set completely and perfectly juxtapose each other. However, a partial overlap is generally the more common assumption.

The above examples illustrate the procedure to solve syllogisms using Venn diagrams. Note that for each problem, one or more than one Venn diagram may have to be drawn to chalk out all possible outcomes.

FOR STUDY MATERIAL & COACHING CONTACT DAS SIR IN KOLKATA AT 09038870684.

These questions take relatively lesser time to solve, allowing one to have greater accuracy. In these questions, you are required to define the relationship diagrammatically between the two or three contents given. The questions in this case are based upon the knowledge of universal facts.

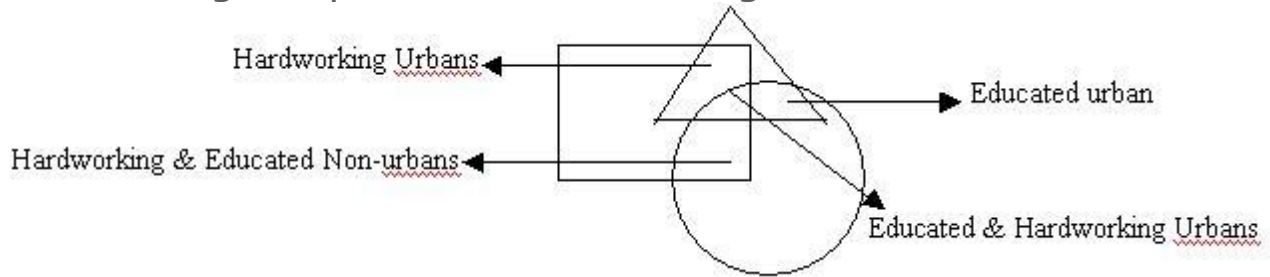
In such questions, the candidate is expected to establish a relationship among three or more items represented by diagrams. This requires a logical understanding and careful observation of the diagrams. The items represented by the diagrams may be individuals, groups, class/category of individuals, or some other phenomenon. Generally two types of questions are asked in this category. Given below are some questions of the first type.

Type- 1

In this case, three/four categories are given in terms of diagram followed by four or five questions based on those categories. Let us take an example. The *triangle* represents the *urban*, the *circle* represents the *educated* and

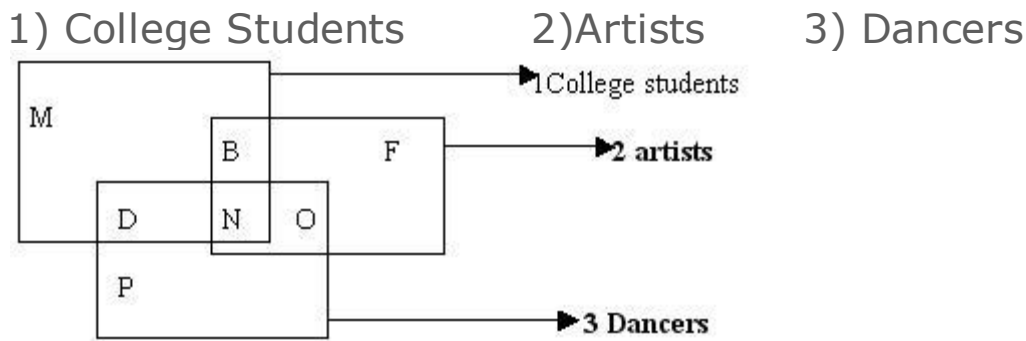
STUDY NOTES BY DAS SIR KOLKATA (09038870684)

the *rectangle* represents *hardworking*.



This above-mentioned diagram will give you the idea of how you are supposed to answer the questions in this case.

Example No. 1: The following questions are based on the diagram given below where each rectangle represents a class of people:



a) College students who are artists but not dancers are represented by

Solution: It can be seen that the students (in rectangle no. 1) and artists (in rectangle no. 2) but not dancers (not in rectangle no. 3) is represented by the letter B and is the right answer.

b) Artists who are neither dancers nor college students are represented by

Solution: In rectangle no. 2 but not in 1 and 3 and this is represented by the letter F.

c) College students who are dancers but not artists are represented by

Solution: In rectangle no. 1 and 3 but not in rectangle no. 2 and this is represented by the letter D.

d) College students who are artists as well as dancers are represented by

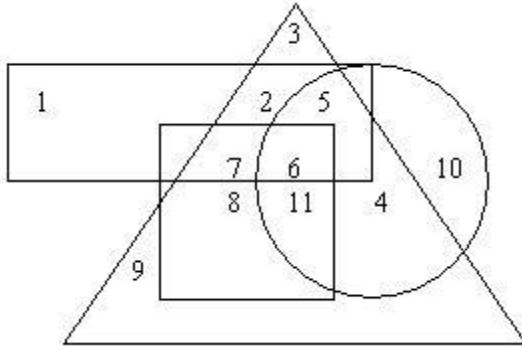
Solution: It means the part which is common to all the three rectangles and this is represented by the letter N.

e) College students who are neither dancers nor artists are represented by

Solution: It means the part, which is inside rectangle no. 1 but not in rectangle no. 2 and in rectangle no. 3. This is represented by the letter M and is the right answer.

EXAMPLE2: Refer to the following diagram and answer the questions given thereafter.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)



The rectangle represents Married Employees.

The Triangle represents Urban people.

The circle represents Post Graduates.

The square represents Workers.

1. Which of the following statements is true?

- A. All married employees are workers.
- B. Some married employees are postgraduates as well as workers.
- C. All married employees are postgraduates.
- D. All workers are married employees but not postgraduates.

Solution: The above cases may be considered as follows:

For statement A to be true, the rectangle should lie inside the square, this is not true, hence A is false.

For statement B to be true there should be a region common to the rectangle, circle and the square. Such a region is 6. Hence B is true.

For statement C to be true, the rectangle should lie inside the circle, so C is false.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)

For statement D to be true, the square should lie wholly inside the rectangle, with no region common to the circle, this is not true. So D is false.

2. Which of the following statement is true?

- A. All urban people are postgraduates.
- B. All workers are married employees but not urban people.
- C. All married employees all workers.
- D. Some urban people are not postgraduates.

Solution: For the validity of condition A, the triangle should lie inside the circle. This is not true.

So, A is false.

For the validity of statement B, there should be a region which is common to the square and the rectangle but is not apart of the triangle. Since no such region exists, B is false. For the validity of statement C, the rectangle should lie inside the square. This is not true. So C is false.

For the validity of statement D, do me region of the triangle should lie outside the circle. Since this is true.

3. Choose the correct statement:

- A. Some workers are married employees.
- B. No worker is urban people.
- C. All postgraduates are urban people.
- D. All postgraduates are married employees.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)

Solution: For the validity of statement A, there should be a region common to the square and rectangle. Such regions are 6 and 7. So, A is true.

Further, for statement B to be true, there should be no region common to the square and the triangle. But since the square lies wholly inside the triangle, B is false.

For statement c) to be true, circle should lie inside the triangle. Clearly, C is false.

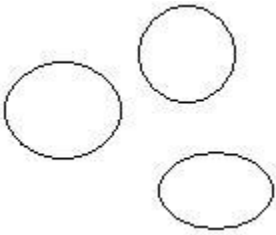
For the validity of statement d), the circle should lie inside the rectangle. Clearly Dis false.

Type- 2

This is another type of question based on logical diagram, known as venn diagram. In this type, various items and their relationships are represented by circles/rectangles/squares. In these questions, you will be presented with three different classes or groups of familiar objects and will be asked to identify their mutual relationships. In short, it deals with questions which aim at analyzing a candidate's ability to relate certain given groups of items and represent it diagrammatically.

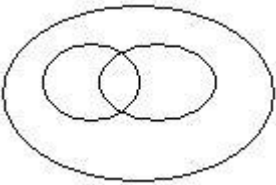
Example No. 1: Lawyers, Mechanics, Doctors

Solution: These three categories have no relation among them. These should be represented by three different diagrams having no intersection at all, as shown below.



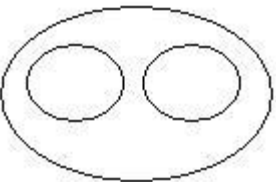
Example No. 2: Females, Sisters, Mothers

Solution: These three categories have a relation in such a way that all the sisters and mothers are females, but some of the sisters could be mothers or some of the mothers could be sisters. Therefore the relationship would be as shown below.



Example No. 3: Planets, Earth, Jupiter

Solution: Both Earth and Jupiter are planets, but they both are different and cannot touch each other. So this relationship can be represented in the following manner.

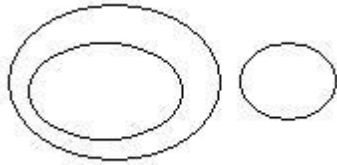


Example No. 4: Doctors, Cats, Humans

Solution: Clearly it can be seen that all the doctors are humans. This should be represented by one circle inside the other circle. But the cats are outside both these categories, so, they should be represented by a different circle. So the

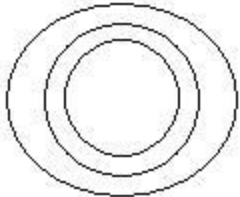
STUDY NOTES BY DAS SIR KOLKATA (09038870684)

relationship can be shown by the following diagram.



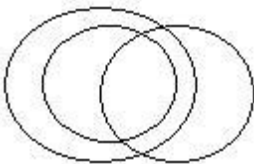
ExampleNo. 5: Prime Numbers, Natural Numbers, Integers.

Solution: In this case, all the prime numbers are natural numbers and all the natural numbers are integers. So it can be best represented by the following diagram.



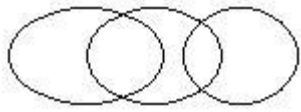
ExampleNo. 6: Doctors, Females, Mothers

Solution: This relationship goes like this: all the mothers are females but all the females are not necessarily mothers. Now females can be doctors but all the females are not doctors, similarly all the mothers are not doctors but some can be doctors. Hence this relationship can be best represented by the following diagram.



ExampleNo. 7: Horses, Pets, Dogs

Solution: Clearly, some dogs and some horses are pets, but all the pets are not necessarily dogs or horses. Secondly dogs and horses are not related to each other. Therefore the relationship can be best represented as



ExampleNo. 8: Females, married females, married persons.

Solution: In this case, all the married females are females as well as married persons, but all the females are not married persons, but some can be, similarly all the married persons are not females, but some definitely are. So the relationship can best be represented by the following diagram.

Venn Diagrams for Categorical Syllogisms

The technique of Venn diagrams for categorical syllogisms is based on the fact that in a valid syllogism, the conclusion asserts no more than what is already contained, implicitly, in the premises. If the conclusion asserts more than that, it does not follow from the premises, and the syllogism is invalid. The technique is to diagram the premises, and then see whether anything would have to be added in order to diagram what the conclusion asserts. If so, the syllogism is invalid; if not, it is valid.

Example:

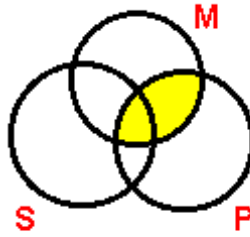
*No **M** is **P** No horned animal is a carnivore*

*All **S** is **M** All moose are horned animals*

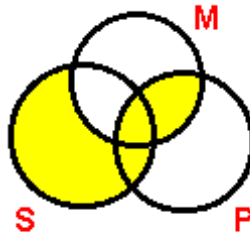
*No **S** is **P** No moose is a carnivore*

The first step is to diagram the major premise, using the circles representing **M** (horned animals) and **P** (carnivores). So we shade out the area of overlap between **M** and **P**.

STUDY NOTES BY DAS SIR KOLKATA (09038870684)



The second step is to add the minor premise to our diagram, using the circles representing **S** and **M**. Since this is an **A** proposition, we shade out the region of **S** outside **M**.



The final step is to examine the completed diagram of the premises and determine whether it contains the information asserted by the conclusion. The conclusion asserts that no **S** is **P**. Thus it requires that the overlap between **S** and **P** be shaded out, and the premises taken together do shade out that region. So the syllogism is valid.

For a syllogism to be valid, the combined diagram must contain all the information asserted by the conclusion. It may contain more information, but it cannot omit anything.

Now let's try a syllogism with a particular premise.

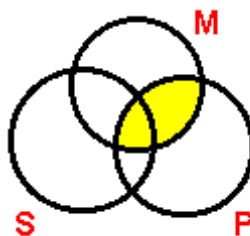
Example:

*No **M** is **P***

*Some **M** are **S***

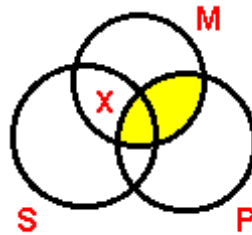
*Some **S** are not **P***

First we diagram the major premise.



STUDY NOTES BY DAS SIR KOLKATA (09038870684)

Second we diagram the minor premise.



Notice that we diagrammed the major premise first. This is not required logically, but whenever there is a particular and a universal premise, it is best to diagram the universal one first. By diagramming the universal premise first, we have shaded out one of the subregions, so now we know that the **X** for the other premise must go outside the **P** circle. And that's useful information, it means that at least one **S** is not **P**. Since that is what the conclusion asserts, the argument is valid.

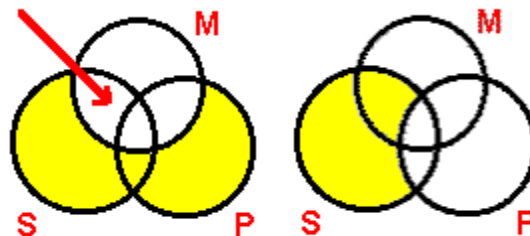
If a syllogism is invalid, a Venn diagram will reveal that fact in one of two ways. The combined diagram for the premises will either fail to shade out an area excluded by the conclusion, or it will fail to put an **X** where the conclusion requires one.

Example:

All P are M
All S are M

—————
All S are P

The Venn diagram reveals the invalidity by failing to shade out the right areas.



In the combined diagram, the area of **P** outside **M** has been shaded to represent the major premise, and the area of **S** outside **M** has been shaded to represent the minor. But one area in the region of **S** outside **P**—the one indicated by the arrow—has not been shaded. Thus, the premises leave open the possibility that some **S** are not **P**; they do

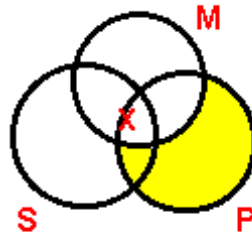
STUDY NOTES BY DAS SIR KOLKATA (09038870684)

not guarantee that all **S** are **P**. So the conclusion does not follow; the syllogism is invalid.

Now let's examine another case in which the invalidity is revealed by the placement of **Xs**.

All P are M
Some S are M

Some S are P



Notice that the **X** is on the line between two subregions of the overlap between **S** and **M**. Locating the **X** on the line means: I know something is both an **S** and an **M**, but I don't know whether it is also a **P** or not. But the conclusion does assert that some **S** are **P**. For the premises to justify this assertion, they would have to give us an **X** in the area of overlap between **S** and **P**. But all they tell us is: there's an **S** that may or may not be a **P**. The conclusion doesn't follow.

IF YOU LIKE MY POST PLZ SHARE IT