PolicePrep Comprehensive Guide to Canadian Police Officer Exams

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Syllogisms

Everything that burns is combustible.
Wood burns.
Wood is combustible.

A syllogism is a form of logical reasoning where two premises lead to a conclusion. The first premise can be either positive or negative, and is usually a universal statement. The second statement can be universal or particular. From these two premises a logical and valid conclusion can be reached.

Either he will be convicted or acquitted.
He was not acquitted.
He was convicted.

In the above example, we are told that there are only two alternatives. In the second premise, we are told that one alternative didn't occur, so we can deduce that the other alternative is true.

Rules and Hints

1) You must assume that the statements are true.

You must take the statements at face value. You can't bring outside knowledge into the logical reasoning. For example:

Rocks are smarter than frogs. - (Premise 1)
Frogs are smarter than men. – (Premise 2)
Men are not as smart as rocks. – (Logical conclusion)

The above syllogism makes logical sense, even though logic tells you that men are more intelligent than both rocks and frogs. Most questions in the actual PATI will make sense so it should be easier, but be aware of the logic.

2) Be careful with syllogisms where there are no absolute statements.

For example:

Some living things are animals.
Some animals are mammals.

Based on these two sentences, you might want to conclude that some mammals are living things. Based on logical reasoning, this would be incorrect. To illustrate this, replace the word "mammals" with the word "dead".

Some living things are animals.
Some animals are dead.

It would be incorrect to assume that some dead are living things.

3) Be careful of qualifying words such as "only".

There is a big difference between the following two statements.
If he wins, he will celebrate (he may celebrate even if he doesn't win).
and
Only if he wins, he will celebrate (he will not celebrate unless he wins).

4) Applying the forms.

It is a good idea if you have difficulty solving a syllogism, attempt to apply the formulas below. Write the formulas out on a piece of paper if you have to.

5) Reordering sentences.

If you are organizing your syllogisms into forms, and you are still confused, attempt to reverse the order of the statements and apply the form again. This may clear up some confusion. There are some examples of this in the forms below.

For additional information and help with syllogisms review some of the posts in the PolicePrep Forum as there are some very good ones. In addition you can review some material found on Wikipedia.

Forms

Syllogisms can take many forms. Below are several forms that you may come across. You can replace the letters with any words or groups of words and the logic will hold. You may have to memorize some of the forms, but do your best to try and understand why the forms make sense and are logical. If you think through them, they should start to make sense, and the more practice questions you do, the better you will get at it.

1)
Either A or B. - (Premise 1)
B. - (Premise 2)
Not A. - (Logical Conclusion)

Example:

John had decided that he would either run or take the bus.
John had decided to take the bus.
Therefore John did not run.

2)
Either A or B.
Not B.
A.

Example:

Susan was planning on studying for the evening or taking a break and going out with friends.
None of her friends were available to go out with
Therefore Susan decided to study.

3)
If A then B.
A.
B.

Example:

If the the solution makes sense then we will have to adopt it.
The solution made sense.
Therefore we adopted it.

4)
If A then B.
Not B.
Not A.

Example:

If it is cold then everyone outside will wear coats.
No one outside is wearing coats.
Therefore it is not cold outside.

5)
If A then B.
If B then C.
If A then C.

Same as: If A then B.
If C then A.
If C then B.
The sentences would just be in reverse order.

Example:

If we take the bus then we will arrive in time.
If we arrive in time then we will win the game.
Therefore if we take the bus then we will win the game.
(Note: You cannot assume that if C happens then A must have happened. The team could win even if they do not take the bus.)

6)
No A are B.
Some C are B.
Some C are not A.

Same as:

No A are B.
Some C are A.
Some C are not B.

Example:

None of the animals that were kept in the zoo were wild.
Some of the tigers were extremely wild and aggressive.
Some of the tigers were not animals kept in the zoo.
(Note: You cannot assume that all of the tigers were not kept in the zoo.)

7)
No A is B.
All B are C.
Some C are not A.

Example:

No team members are blonde.
All blondes have blue eyes.
Therefore some people with blue eyes are not team members.
(Note: You cannot assume that all people with blue eyes are not team members, as there is no mention whether or not brunettes or some other group have blue eyes and are members of the group. You also cannot know for certain whether or not some team members have blue eyes or not. It is not known.)

8)
No A are B.
No B are C. (or No C are B.)
No definite conclusion between A and C.

Example:
No factories are emission compliant bodies.

No emission compliant bodies are in North America.
A conclusion cannot be reached between the factories and North America. There may or may not be factories in North America.

9)
Some A are B.
All B are C.
Some C are A.

Example:

Some people at the meeting were visitors from France.
All visitors from France had come from an area in the south by Nice.
Therefore some people visiting from the south of France were at the meeting.

10)
Some A are B.
Some B are C.
No definite conclusions.

Example:

Some of the children in the city have cholera.
Some people who have cholera are female.

From the statements you cannot draw any conclusions. The statements do not indicate that any of the children in the city are female, nor do they state that the females with cholera live in the city. You can only draw conclusions from within the sentences such as:
Some of the people in the city have cholera (sentence one) and at least some females have cholera (uncertain whether all of them do or not).

11)
Some A are B.
All A are C.
Some C are B.

Example:
Some buildings have copper plumbing.
All buildings are made of brick.
Therefore some things that are made of brick have copper plumbing. Note this is different than the format Some A are B and All B are C.

12)
All A are B.
Some B are C.

No definite conclusion between A and C.

Example:
All guitar players are women.
Some women are athletes.

You cannot conclude that some guitar players are athletes in this case. The women who are athletes might be a completely different group and might include guitar players, but might not. You can't reach a conclusion.

13)
All A are B.
All C are B.
The only conclusion you can reach is that A and C share the property of B. Very few logical conclusions will be reached with this form.

Example:
All grass is green.
All the candies are green..

There are very few conclusions you could reach other than stating that both grass and candies have the same colour (Both A and C are B).

14)
All A are B.
No B are C.
No C are A.

Same as:

No A are B.
All C are B.
No C are A.

Example:
No one willing to sacrifice comfort is a traveller.
All ecological people are willing to sacrifice comfort.
Therefore no travellers are ecological people.
This example is the same format of argument as the above form, the only difference is the lines have been reversed (No B are C, followed by All A are B.). The logic and reasoning is the same.

15)
All A are B.
All B are C.
All A are C.

or
Some C are A.

Example:
All of the men in the room are are baseball players in the room.
All of the baseball players in the room are athletic people in the room.
All of the men in the room are athletic people in the room.

This is similar to the if A then B, if B then C, where logical conclusions about A can be reached from C (all of the men are athletic), but the only logical conclusion that can be reached about C from A is that some C are A.(you can't assume that all athletic people are men, there may be women or children in the room as well). Nor can you reach an absolute conclusion about B from A, only some B are A (you can't assume that all of the baseball players in the room are men. Some could be women or children as well.)

16)
All A are B.
Some C are not A.
Some C are B.

Same as:

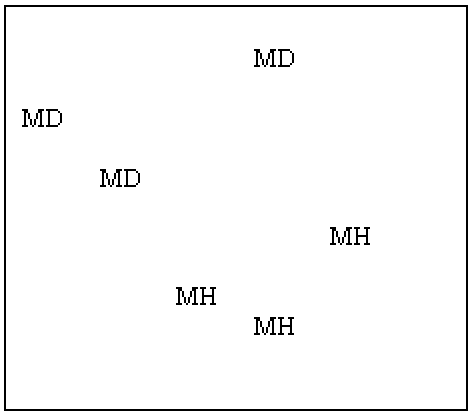
Some A are not B.
All B are C.
Some C are B.

Example:
All packages are fragile.
Some boxes are not packages.
Some boxes are fragile.

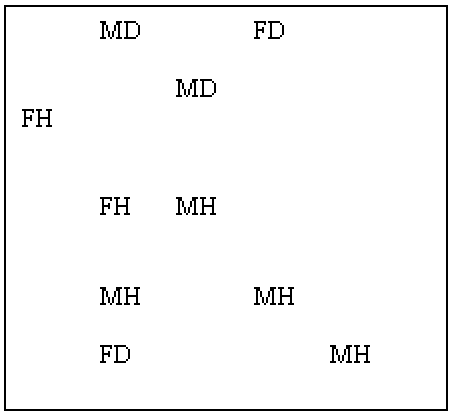
Below are answers to several emails we received for futher clarification. The students questions are in regular font, and our responses are in bold.

I'd strongly advise you to concentrate on understanding why the answers and patterns are the way they are, as opposed to memorizing the forms only. You will get confused a bit if you are looking for hard fast rules that always apply, because you can change answer choices and forms just a bit to cause problems. TRY TO UNDERSTAND THE REASONING.

Scenario 1



Scenario 2



Syllogism illustrated above:

Some males are humans.
Some males are dogs. (or some males are not dogs).

Can conclude: some humans are males. (works with both scenarios 1 and 2 in some cases it will be "all", but at a minimum, some of the humans have to be males.)

Can conclude: some dogs are males. (works with both scenarios 1 and 2) It will actually work in all situations, as it is a logically sound conclusion.

Cannot conclude:
Some humans are not males. (in scenario 1 all humans are male)
Some dogs are not males. (in scenario 1 all dogs are males).
The above statements work sometimes, but not others. Because they may or may not be true, you cannot reach a definite conclusion.

Hi there,

I'm having trouble with some of the syllogisms i've encountered. Below are some examples:

Reordering statements:

I've noticed this pattern alot and I know for a fact i've seen this on the Pati. I understood this syllogism as normally being:

All A are B
All B are C
= All C are A

OUR RESPONSE: NO WRONG. You cannot assume going backwards that just because All A are B, that all B are A. This is not logical. If you are in a room of 20

men, and I state All baseball players in the room are men, can you assume that all men are baseball players? NO. There might only be 9 baseball players (all of which are men), but 11 of the men would not be baseball players.

All A are B
All B are C
= All A are C

Is this correct?
OUR RESPONSE: YES CORRECT. ALL A ARE C.

Another Question is in regards to: No A are B
All B are C
= Some C are not A

I'm under the impression that any premise that has All in it and starts with NO or None in the first premise will always end with NO or None in the first premise of the conclusion.

eg.
No A are B
All B are C
= No C are A

Is that correct?

NO THIS IS WRONG.

No A is B.
All B are C.
Some C are not A.

Example:
No team members are blonde.
All blondes have blue eyes.
Therefore some people with blue eyes are not team members.

(Note: You cannot assume that all people with blue eyes are not team members, as there is no mention whether or not brunettes or some other group have blue eyes and are members of the group. You also cannot know for certain whether or not some team members have blue eyes or not. It is not known.)

Also, Is it safe to assumer that all syllogisms that have:

Some A are B
Some B are C

= Some.....

NO THIS IS WRONG. You cannot conclude there is any connection at all between A and C. If it said some C are B or Some B are A, then this would be correct.

Be careful with syllogisms where there are no absolute statements. For example:

Some living things are animals.
Some animals are mammals.

Based on these two sentences, you might want to conclude that some mammals are living things. Based on logical reasoning, this would be incorrect. To illustrate this, replace the word "mammals" with the word "dead".

Some living things are animals.
Some animals are dead.

It would be incorrect to assume that some dead are living things.

Finally, in one of your forms you indicate that;

All A are B
All B are C
= All A are C

but then you have Some C are A. Doesn't ; 1st. Alll, 2nd All = All, because you have as an option Some C are A. I've seen some examples in the practice test that could be either Some C are A or Some A are C and/or All A are C.

NO YOU CAN'T ASSUME THAT ALL C ARE A.

All A are B.
All B are C.
All A are C.
or
Some C are A.

Example:
All of the men in the room are are baseball players in the room.
All of the baseball players in the room are athletic people in the room.
All of the men in the room are athletic people in the room.

This is similar to the if A then B, if B then C, where logical conclusions about A can be reached from C (all of the men are athletic), but the only logical conclusion that can be reached about C from A is that some C are A.(you can't

assume that all athletic people are men, there may be women or children in the room as well). Nor can you reach an absolute conclusion about B from A, only some B are A (you can't assume that all of the baseball players in the room are men. Some could be women or children as well.)

How do i know which is right?

You will have to look at the answer choices to determine which of the answers is logical. There will only be one right answer.

Response to another email:

No, there are no typos in these problems and all of them make logical sense. Here is a bit more if an explanation to help you.

Question 12
No girls have curly hair.
All curly haired people are passive.

Answer Choices:
Then most curly haired people are girls.
Then girls are passive.
Then no girls are passive.
Some passive people may be girls.

You answered: Then no girls are passive.

The second sentence says all curly haired people are passive, but it doesn't state that everyone who doesn't have curly hair is submissive (not passive). All curly haired people are passive, but all straight-haired people may also be passive. Your answer choice is wrong. The other two answer choices (1 & 2) are pretty easy to eliminate and I'm sure you understand that, so that leaves option 4. As I mentioned above there is nothing saying that other types of girls might be passive, so it is technically correct. Some passive people may be girls.

There is a huge difference between "are girls" and "may be girls". One statement is making a conclusion, the other is suggesting a possibility. Give it some thought and make sure you understand the reasoning involved.

For this question it should have been very easy to reach the conclusion by eliminating the obviously wrong answers. Once you know that three of the answer choices are wrong, you should feel confident about your answer. Look at

the question and try to understand why it is logical. The sentence basically states that some passive people MAY (or therefore may not) be girls. It is a true statement based on the info in the question as it doesn't draw any conclusion that contradicts the information in the question.

Question 14
Some dogs are pit bulls.
Some pit bulls are aggressive
. You answered: Then some dogs are aggressive.

This is a bit of a tricky questions because it is hard to remember that you can't assume information outside the syllogism into your answer. You are assuming that all pit bulls are dogs. In real life they are, but in this logical syllogism, you can't assume that all pit bulls are dogs. The logic has to work no matter what are changed.

Imagine: Some baseball players (replacing dogs) are men (replacing pit bulls). Some men are aggressive.

The above sentence uses the exact same logic as question 14, but you cannot say for certain that some baseball players are aggressive. They may or may not be. All the men who are aggressive may be baseball players, there may be some baseball players and some who aren't baseball players, or there not be a single baseball player among the aggressive men.

Think through the logic above and really try to understand it. Again, don't feel too bad about question 14, as it is a difficult one.

The mistake you are making is trying to squeeze every question into a pattern without understanding the logic. Give these questions more thought as you work through them and try to understand why it makes logical sense and use the patterns as a guide.