

Exercises for Reading 7 KEY

_____ **Exercises for Section 1.** Peruse the entire chapter. Then read the introductory section at the very beginning of Reading 7. Read this section carefully and try to understand it as best you can.

1. What are we discussing in this chapter?

Terminological Rules for Categorical Syllogisms

2. Make sure you understand each of the seven rules for the validity of a syllogism, the type of rule it is (i.e. terminological, quantitative or qualitative). (Nothing to submit.)

3. How many of these rules does a syllogism have to comply with in order to be considered valid? **All seven**

4. Which two of these rules do we discuss in this reading?

Rule I: There must be three and only three terms.

Rule II: The middle term must not occur in the conclusion.

5. Why are these rules called **terminological** rules?

They have specifically to do with the terms in syllogism.

6. What are the three terms contained in a syllogism? [Review]

Major, minor, and middle

7. Explain how to distinguish major, minor and middle terms. [Review]

The major term is the predicate of the conclusion.

The minor term is the subject of the conclusion.

The middle term appears in each of the premises, but not in the conclusion.

8. In a syllogism, which premise is the minor premise? [Review]

The minor premise is the premise that contains the minor term.

9. In a syllogism, which premise is the major premise? [Review]

The major premise is the premise that contains the major term.

10. In the following syllogisms, indicate which is the major premise and which is the minor premise the minor premise by writing major or minor next to the appropriate premise. Indicate also the minor, major, and middle terms by using S, P, and M. [Review]

All plants^M are living things^P. **Major premise**

A daisy^S is a plant^M **Minor premise**

Therefore, a daisy^S is a living thing^P.

All animals^M were created by evolution^P.
Horses^S are animals^M.
Therefore, horses^S were created by evolution^P.

Major premise
Minor premise

No animal^M is rational^P.
My dog Spot^S is an animal^M.
Therefore, my dog Spot^S is not rational^P.

Major premise
Minor premise

_____ **Exercises for Section 2.** Read "Rule I: There Must be Three and Only Three Terms."
Read it carefully.

11. What is Rule I?

There must be three and only three terms.

12. Indicate the two ways in which this rule can be violated.

There can be more than three clearly distinguishable terms.

There can be an ambiguous middle term.

Note: It is critical that you understand two terms here. One is "ambiguous." The other is "equivocation."

13. Explain the Fallacy of Four Terms.

Instead of three terms, there are four, which do not connect together, making it impossible to draw a conclusion.

14. Explain the Fallacy of Equivocation.

An argument where a term changes meaning, making it seem that there is a connection, but when really there is not.

15. What does it mean when a term is equivocal?

A term that looks the same, but has two different meanings. For example, in the following sentence, you can see that "biggest" has two meanings, making the statement ambiguous: "The biggest Giants fans are from Marin County." Does "biggest" mean "most enthusiastic," or "most overweight"?

16. Tell whether the following syllogisms are examples of the Fallacy of Four Terms (FFT) or the Fallacy of Equivocation (FE) by circling FFT or FE:

All wildebeasts are mammals.

All lions are felines.

Therefore, all felines are mammals.

• FFT • FE

All animals are irrational.

All dogs are mammals.

Therefore, all mammals are irrational.

- **FFT**
- FE

All accidents are life-threatening.

This new recipe was an accident.

Therefore, this new recipe is life-threatening.

- FFT
- **FE**

All banks contain money.

All rivers have banks.

Therefore, all rivers contain money.

- FFT
- **FE**

All mice eat cheese.

Some computer parts are mice.

Therefore, some computer parts eat cheese.

- FFT
- **FE**

All kings are powerful

No Queens are men

Therefore, some men are powerful.

- **FFT**
- FE

All aliens are from outer space.

All foreigners are aliens.

Therefore, foreigners are from outer space.

- FFT
- **FE**

All roses have thorns .

All flowers are beautiful.

Therefore beautiful things have thorns.

- **FFT**
- FE

_____ Exercises for Section 3.

17. Convert the syllogisms you marked **FFT** (Fallacy of Four Terms) in question 16. above into syllogisms that comply with rule I. In other words, use three of the four terms you find in them and construct an argument that has a major term, a minor term and a middle term:

This is the most difficult task you've had so far. Not only is it necessary to remove the extra term, but the new argument must not violate any of the other rules. (There is more than one correct solution for each of these.)

All felines are mammals.
All lions are felines.
Therefore, all lions are mammals.

All animals are irrational.
All dogs are animals.
Therefore, all dogs are irrational.

Not only does the next argument have four terms, it violates Rule VII.

Original argument:
All kings are powerful
No Queens are men
Therefore, some men are powerful.

New argument:
All kings are powerful
Some men are kings (I started with "Some kings are men" and converted it.)
Therefore, some men are powerful.

All roses have thorns.
Some flowers are roses.
Therefore, some flowers have thorns.

Read "Rule 2: The Middle Term Must not Occur in the Conclusion." Read it carefully.

18. What is Rule II?

The middle term must not occur in the conclusion.

19. Indicate whether the syllogisms below violate Rule IL (simply write "Yes" or "No")

All lions are **felines**. **Yes**
All **felines** are animals.
Therefore, some **felines** are lions.

All **animals** are living beings. **No**
All mice are **animals**.
Therefore, all mice are living beings.

All **animals** are irrational. **No**
All horses are **animals**.
Therefore, all horses are irrational.

Some men are **kings**. **Yes**
All **kings** are powerful.
Therefore, some **kings** are men.

All **things life-threatening** should be avoided. **No**
All accidents **are life-threatening**.
Therefore, all accidents should be avoided.

All **aliens** are supposed to be registered. **No**
All foreigners are **aliens**.
Therefore, all foreigners are supposed to be registered.

All **that contain water** are wet. **No**
All rivers **contain water**.
Therefore, all rivers are wet.

All flowers are **beautiful things**. **Yes**
All **beautiful things** should be admired.
Therefore, some **beautiful things** have flowers.

20. Circle (or make **bold**) the middle terms in the syllogisms in question 19. (the middle term in these cases will be the term that appears in both premises).

_____ Exercises for Section 4.

21. Using the terms in the syllogisms you found to be invalid in question 19, construct 5 syllogisms that comply with rules I and II.

Sorry. There is a mistake here. There are only three arguments that commit the fallacy. (There is more than one way to correctly answer these.)

All lions are **felines**.
All **felines** are animals.
Therefore, some **animals** are lions.

Some men are **kings**.
All **kings** are powerful.
Therefore, some **powerful things** are men.

All flowers are **beautiful things**.
All **beautiful things** should be admired.
Therefore, some **things that should be admired** are flowers.

22. In the following syllogisms, indicate which is the major premise and the minor premise by writing **major** or **minor** in the space provided. Indicate also the minor, major and middle terms by using S, P, and M. Determine whether the syllogism is valid or invalid. If it is invalid, tell whether it violates Rule I or Rule II (Hint: if you have a hard time determining the minor and major terms, it is probably because it violates one of these rules) :

A horse^{M?} is a quadruped. Major premise
 All mammals^S breathe oxygen^{M?}. Minor premise
 Therefore, some mammals^S are quadrupeds^P. Invalid FFT, Rule I

All Romans^M were brave^P. Major premise
 Julius Caesar^S was a Roman^M. Minor premise
 Therefore, Julius Caesar^S was brave^P. Valid

All horses^{M?} are fast^P. Major premise
 Secretariat^{M?} is a horse^S. Minor premise
 Therefore, some horses^S are fast^P. Invalid, Rule II

All food^{M?} should be eaten^P. Major premise
 This logic problem^S is food for thought^{M?}. Minor premise
 Therefore, this logic problem^S should be eaten^P. Invalid, FFT, Rule 1

23. Tell whether the following are true or false:

- T** **F** In order for a syllogism to be valid, it must comply with all seven rules.
- T** **F** A syllogism must have a minor, major and middle term.
- T** **F** If a syllogism commits the Fallacy of Four Terms, that means it does not contain enough terms.
- T** **F** In a valid syllogism, the minor and major term are connected together by the middle term.
- T** **F** The Fallacy of Equivocation is easier to spot than the Fallacy of Four Terms.
- T** **F** Rules I and II are considered terminological rules because they have to do with the nature of the terms in a syllogism.
- T** **F** A syllogism violates Rule II when more than one middle term appears in the premises.
- T** **F** The minor term is the subject of the conclusion.

_____ Review Exercises

25. What is the definition of reasoning?

Reasoning is the act by which the mind acquires new knowledge by means of what it already knows.

26. Give a brief explanation of the three steps involved in the reasoning process.

Perceive the first premise as being true

Perceive the second premise as being true. (Antecedent)

Deductive inference (conclude)

27. What is the definition of syllogism?

A syllogism is a group of propositions in orderly sequence, one of which (the consequent) is said to be necessarily inferred from the others (the antecedent).

28. What is the Essential Law of Argumentation?

If the antecedent (premises or reasons) is true, the consequent (conclusion) must also be true.

29. What is the first corollary to the Essential Law of Argumentation?

If the syllogism is valid and the consequent is false, then the antecedent (i.e. one or both of the two premises) must be false.

30. What is the second corollary to the Essential Law of Argumentation?

In a valid syllogism with a true consequent, the antecedent is not necessarily true (i.e. one or both of the premises may still be false).

31. What is the Principle of Reciprocal Identity?

Two terms that are identical with a third term are identical to each other.

32. What is the Principle of Reciprocal Non-Identity?

Two terms, one of which is identical with a third term and the other of which is nonidentical with that third term, are nonidentical to each other.

33. What is the Dictum de Omni?

What is affirmed universally of a certain term, is affirmed of every term that comes under that term.

34. What is the Dictum de Nullo?

What is denied universally of a certain term is denied of every term that comes under that term.