

Syllogism

Any deductive argument in which a conclusion is inferred from two premises.

Categorical syllogism

A deductive argument consisting of three categorical propositions that contain exactly three terms, each of which occurs in exactly two of the propositions.

Standard form

The form in which a syllogism is said to be when its premises and conclusion are all standard-form categorical propositions (**A**, **E**, **I**, or **O**) and are arranged in standard order (major premise, then minor premise, then conclusion).

No heroes are cowards. (**major premise**)

Some soldiers are cowards. (**minor premise**)

Therefore, some soldiers are not heroes.

Terms of the Syllogism: Major, Minor, and Middle

The conclusion in our sample is an O proposition, "Some soldiers are not heroes."

The term that occurs as the *predicate* of the conclusion ("heroes," in this case) is called the **major term** of the syllogism.

The term that occurs as the *subject* of the conclusion ("soldiers," in this case) is called the **minor term** of the syllogism.

The third term of the syllogism ("cowards," in this case), which never occurs in the conclusion but always appears in both premises, is called the **middle term**.

The premise containing the major term is called the **major premise**. In the example, "heroes" is the major term, so the premise containing "heroes" — "No heroes are cowards" — is the major premise.

The premise containing the minor term is called the **minor premise**. In the example, "soldiers" is the minor term, so the premise containing "soldiers" — "Some soldiers are cowards" — is the minor premise.

In a standard-form syllogism, the major premise is always stated first, the minor premise second, and the conclusion last.

The Mood of the Syllogism

The **mood** of a syllogism is determined by the types (**A**, **E**, **I**, or **O**) of standard-form categorical propositions it contains. The mood of the syllogism is represented by three letters, and those three letters are always given in standard-form order.

No heroes are cowards. ---**E**

Some soldiers are cowards. ---**I**

Therefore, some soldiers are not heroes. ---**O**

*The mood of this syllogism is **EIO**.*

The Figure of the Syllogism

- (1) All great scientists (major term) are college graduates (middle term). **A**
Some professional athletes (minor term) are college graduates (middle term). **I**
Therefore, some professional athletes (minor term) are great scientists (major term). **I**

AII-2

- (2) All artists (middle term) are egotists (major term). **A**
Some artists (middle term) are painters (minor term). **I**
Therefore, some painters (minor term) are egotists (major term). **I**

AII-3

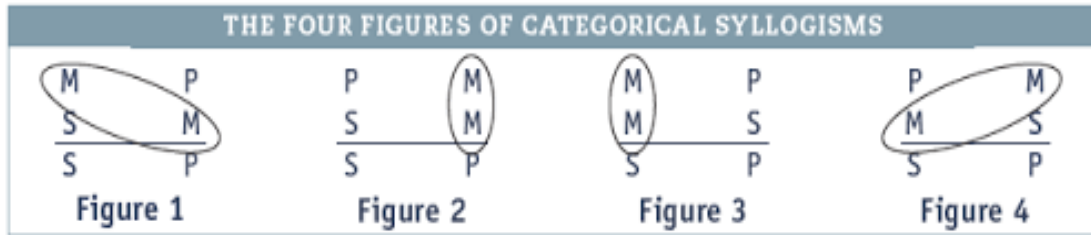
(1) All *P* is *M*.
Some *S* is *M*.
∴ Some *S* is *P*.
(invalid)

(2) All *M* is *P*.
Some *M* is *S*.
∴ Some *S* is *P*.
(valid)

To describe the form of a syllogism completely we must state its *mood* (the three letters of its three propositions) and its *figure*—where **by figure we mean the position of the middle term in its premises.**

Syllogisms can have four—and only four—possible different figures:

1. The middle term may be the subject term of the major premise and the predicate term of the minor premise; or
2. The middle term may be the predicate term of both premises; or
3. The middle term may be the subject term of both premises; or
4. The middle term may be the predicate term of the major premise and the subject term of the minor premise.



Each mood can occur in each of the four figures; $4 \times 64 = 256$. It is certain, therefore, that there are exactly 256 distinct forms that standard-form syllogisms may assume.

Of these 256 possible forms, as we shall see, only a few are valid forms. Each of those valid forms has a unique name.

There are 19 valid forms

1st Figure: 4

BARBARA, DARII, CELARENT, FERIO

AAA, AII, EAE, EIO

2nd figure: 4

CAMESTERS, FESTINO, BAROCO, CESARE

AEE, EIO, AOO, EAE

3rd Figure: 6

DARAPTI, DATISI, FELAPTON, FERISON, DISAMIS, BOCARDO

4th Figure: 5

BRAMANTIP, CAMENES, FESAPO, FRESISON, DIMARIS.

Features of a Categorical Syllogism

No one of the constituent propositions of a syllogism is necessarily true, or necessarily false.

The validity or invalidity of any syllogism depends entirely on its *form*.

Validity and invalidity are completely independent of the specific content of the argument or its subject matter.

Thus any syllogism of the form **AAA-1**

All *M* is *P*.

All *S* is *M*.

All *S* is *P*.

is valid, regardless of its subject matter. The name of this syllogism's form is *Barbara*

If we substitute “Athenians” and “humans” for *S* and *P*, and “Greeks” for *M*, we obtain this valid argument:

All Greeks are humans.

All Athenians are Greeks.

All Athenians are humans.

If we substitute the terms “soaps,” “water-soluble substances,” and “sodium salts” for the letters *S*, *P*, and *M* in the same form, we obtain

All sodium salts are water-soluble substances.

All soaps are sodium salts.

Therefore all soaps are water-soluble substances.

which also is valid.

A valid syllogism is valid in virtue of its *form* alone, and so we call it formally valid.

If any syllogism is valid in virtue of its form alone, *any other syllogism having that same form will also be valid*; and if a syllogism is invalid, *any other syllogism having that same form will also be invalid*.

Assumption: The constituent propositions of a syllogism are themselves contingent, that is, neither logically true nor logically false.

The reason for the assumption is this:

If it contained either a logically false premise or a logically true conclusion, then the argument would be valid regardless of its syllogistic form—valid in that it would be logically impossible for its premises to be true and its conclusion false.
