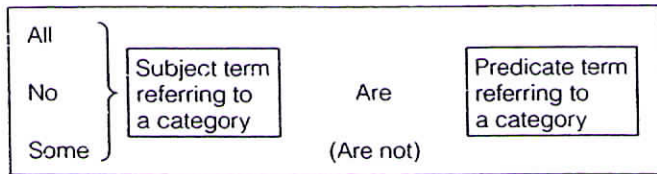


Categorical Logic (syllogism)

A statement in categorical form can be schematized as follows:



The sentences below are not in categorical form:

Not all magicians use mirrors.

The cat swallowed the bird.

There's a rusty car in the ditch.

No men are allowed.

Jane kissed Tom.

Only chemists are excluded.

Everyone except the graduating seniors is dismissed.

Each of these sentences can be translated into proper categorical form, and we turn now to a discussion of guidelines for such translations.

4.2 Translating Guide

1. Supplying Group Terms Many words or phrases in ordinary language do not explicitly refer to a group or category. For example, in the statement "Some roses are red," the predicate term "red" does not name a group of things. But we can easily supply it. The sentence says, in effect, that some roses belong to the category of red things. We can therefore rewrite it as "Some roses are red things" or "... red flowers," if we are sure it refers only to flowers. When we supply group terms, we rewrite the subject or predicate terms so they name groups of things. In the following examples the words or phrases supplied to achieve proper categorical form are underlined.

Example 1	<i>All bachelors are unmarried.</i>	<i>All bachelors are unmarried <u>males.</u></i>
Example 2	<i>Some letter carriers are tired.</i>	<i>Some letter carriers are tired <u>persons.</u></i>
Example 3	<i>No dancers are ready for the performance.</i>	<i>No dancers <u>are persons who are</u> ready for the performance.</i>
Example 4	<i>Some of the platoon are infantrymen.</i>	<i>Some <u>members of the platoon</u> are infantrymen.</i>

2. Supplying a Copula Translating sentences that use verbs other than *are* and *are not* usually requires placing the original verb within the predicate phrase. In the following examples, notice how the verbs are translated, especially verbs in the past tense. The phrases supplied are underlined.

Example 5	<i>No seagulls like pelicans.</i>	<i>No seagulls <u>are birds that like pelicans.</u></i>
Example 6	<i>Some dogs would rather bite than bark.</i>	<i>Some dogs <u>are dogs that would rather bite than bark.</u></i>
Example 7	<i>All dieters eat vegetables.</i>	<i>All dieters <u>are persons who eat vegetables.</u></i>
Example 8	<i>Some players were not present.</i>	<i>Some players <u>are persons who were not present.</u></i>

3. Proper Names and Singular Expressions Proper names are names of persons, countries, brands of products, and so on. Singular expressions are expressions that refer to a particular person or thing, such as *this house*, *that car*, or *the man in the trench coat*. Both proper names and singular expressions refer to particular things rather than to groups of things. Here are some examples:

- Socrates is a man.*
- This fire fighter is due for a raise.*
- Venezuela is an oil-rich country.*
- John kissed Mary.*
- Today is my birthday.*

This type of sentence presents a special problem in categorical logic because it is not a statement about a *group* of things. You might be tempted to translate "Socrates is a man," for example, as "All Socrates are men" (or, even worse, "Some Socrates are men"). That not only sounds odd but suggests that "Socrates" names a group of things (in this case, a group of men), and surely it does not. How then do we handle statements about individuals in a system designed for statements about groups? The solution is wordy but clever. We introduce a group that necessarily has only one member in it. The term *persons identical to Socrates* names a group, but it is a group that can have only one member in it, since only one thing in existence is identical to Socrates, namely, Socrates himself. (This special expression "identical to" is understood to mean *one and the same as*. It does not mean *another one the same as*, as in the sentence *Your car is identical to my car*.) The examples given above can be translated into categorical statements using this special expression, as follows.

Example 9	<i>Socrates is a man.</i>	<i><u>All persons identical to Socrates are men.</u></i>
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Example 10	<i>This fire fighter is due for a raise.</i>	<u>All persons identical to this fire fighter are persons due for a raise.</u>
Example 11	<i>Venezuela is an oil-rich country.</i>	<u>All countries identical to Venezuela are oil-rich countries.</u>
Example 12	<i>John kissed Mary.</i>	<u>All persons identical to John are persons who kissed Mary.</u>
Example 13	<i>Today is my birthday.</i>	<u>All days identical to today are days identical to my birthday.</u>

4. Supplying Quantifiers In some cases the quantifier of a statement is left unstated. You must determine how much of the subject is being referred to and whether it is meant to affirm or deny the predicate of the subject. Consider these examples.

Example 14	<i>Roses are red.</i>	<u>All roses are red flowers.</u>
Example 15	<i>The ox is a strong beast.</i>	<u>All oxen are strong beasts.</u>
Example 16	<i>Emeralds are not cheap.</i>	<u>No emeralds are cheap.</u>
Example 17	<i>The soul is not immortal.</i>	<u>No souls are immortal.</u>

Some uses of the articles “a” and “the” are ambiguous. In some sentences they may be used to refer to all members of a class—as in *The whale is an enormous mammal*—and in others they refer to a single individual—as in *The whale is on the beach*. When the article is ambiguous, ask yourself: In this sentence, are we talking about all members of the subject class, some of them, or a single individual? Read the following examples carefully and notice how the same phrase may refer to a group in one context and to an individual in another.

Example 18	<i>The police officer is our friend.</i>	<u>All police officers are our friends.</u>
Example 19	<i>The police officer is at the door.</i>	<u>All persons identical to this police officer are persons at the door.</u>
Example 20	<i>Police officers are our friends.</i>	<u>All police officers are our friends.</u>

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- Example 21** *Police officers are at our door.* *Some police officers are persons at our door.*
- Example 22** *An apricot is not a vegetable.* *No apricots are vegetables.*
- Example 23** *A fish is on the line.* *All things identical to this fish are things on the line.*