

### 5.2.1. Names and Predicates: Construction and Translation Problems

A. For each of the strings of symbols below, decide whether it a **formal sentence** according to the rules of our revised construction rules listed here.

#### Revised Construction Rules (*First Draft*)

##### Atomic Sentences:

- A1. Sentence letters are atomic sentence
- A2. A predicate letter followed by a name letter is an atomic sentence.

##### Formal Sentences:

1. Atomic sentences are formal sentences.
2. If  $\bullet$  is a formal sentence, then  $\sim\bullet$  is a formal sentence.
3. If  $\bullet$  and  $\blacktriangle$  are formal sentences, then  $(\bullet \wedge \blacktriangle)$  is a formal sentence.
4. If  $\bullet$  and  $\blacktriangle$  are formal sentences, then  $(\bullet \vee \blacktriangle)$  is a formal sentence.
5. If  $\bullet$  and  $\blacktriangle$  are formal sentences, then  $(\bullet \rightarrow \blacktriangle)$  is a formal sentence.

1.  $(GA \vee HA)$

2.  $\sim BA$

3.  $(A \wedge P)$

4.  $HAB$

5.  $(P \rightarrow MC)$

**B.** Using the following translation tables, **translate** the English sentences into our (revised) formal language.

**A:** Socrates

**B:** Plato

**C:** Benjamin Franklin

**D:** Rex

**E:** William James

**F:** Kermit

**G:** \_\_\_\_ is an inventor

**H:** \_\_\_\_ is an astronomer

**I:** \_\_\_\_ is a mathematician

**J:** \_\_\_\_ loves abstract theory

**K:** \_\_\_\_ is a philosopher

**L:** \_\_\_\_ is green

**M:** \_\_\_\_ is a frog

**N:** \_\_\_\_ can talk

1. Benjamin Franklin is an inventor, but Socrates isn't.
2. Plato is neither an astronomer nor a mathematician.
3. If Rex is a mathematician, then he loves abstract theory.
4. Although William James doesn't love abstract theory, he is a philosopher.
- 5a. Kermit is green and Kermit is a frog.
- 5b. Kermit is a frog who is green.
- 5c. Kermit is a green frog
- 6a. Benjamin Franklin isn't green, and he isn't a frog.
- 6b. Benjamin Franklin isn't a green frog.
- 6c. It's not the case that Benjamin Franklin is both green and a frog.
7. Kermit is a green frog who can talk.

**C. Translate** the following English arguments into the formal language (showing the **translation table** used).

(1)

1. Mo is angry and Mo is red and Mo is a dinosaur.

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$\therefore$  Mo is an angry red dinosaur.

(2)

1. Mo is either a meat-eating dinosaur, or one that eats plants.

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$\therefore$  Mo is a dinosaur, and is either a meat-eater or a plant-eater.