1 TRANSLATING JUST THE CONNECTIVES

Starting from the main connective, and working in, translate each connective, using the following procedure:

- rewrite the sentence in official notation
- replace ¬ϕ with "It is not the case that ϕ"
- replace ($\phi \rightarrow \psi$) with "(If ϕ, then ψ)".

Continue until you have translated all the connectives, so the only symbols left are the sentence letters and the parentheses. Then drop all and only the parentheses you can without introducing ambiguity.

Example:

- ¬(P → (Q → R))
- It is not the case that (P → (Q → R))
- It is not the case that (if P, then (Q → R))
- It is not the case that (if P, then (if Q, then R))

Which of the pairs of parentheses can be removed?

Example:

- P → ¬(Q → ¬R)
- (P → ¬(Q → ¬R))
- (If P, then ¬(Q → ¬R))
- (If P, then it is not the case that (Q → ¬R))
- (If P, then it is not the case that (if Q, then ¬R))
- (If P, then it is not the case that (if Q, then it is not the case that R))

Which of the pairs of parentheses can be removed?

1. ¬(¬P → ¬Q)
2. (P → Q) → (Q → R)
3. (P → Q) → ¬(Q → P)
4. (P → (Q → (R → S)))

2 ALL THE WAY TO ENGLISH

Scheme of Abbreviation: P: "You are happy", Q: "You know that you are happy", R: "You clap your hands", S: "Your face shows that you are happy".

Now complete the translation into English of the sentences from above, by replacing the sentence letters with the corresponding English sentences. Then think about whether or not there are ways to express the claims in more simple English.

Example:

- It is not the case that (if P, then (if Q, then R))
- It is not the case that (if you are happy, then (if you know that you are happy, then you clap your hands))

Example:

- (If P, then it is not the case that (if Q, then it is not the case that R))
- (If you are happy, then it is not the case that (if you know that you are happy, then it is not the case that you clap your hands))
- If you are happy, then it is not the case that if you know it, you don't clap your hands.

3   Stylistic Variants of "if...then..."

Symbolize:

5. P if Q
6. Given that Q, P
7. R on the condition that P
8. P only if Q
9. If Q only if P, then R
10. Q provided that P, if R
11. If if P then Q then R
12. If if P, Q, R.
13. If if if if P, Q, R, S, T (!!!)

4   Symbolization

Given the following scheme of abbreviation, symbolize the following sentences.

P: I take my horse to the old town road. Q: I ride my horse. R: I can ride my horse more. S: I have horses in the back. U: You can tell me something. V: My life is a movie. W: I have Wranglers on my booty.

14. You can't tell me nothing.
15. If I take my horse to the old town road, I don't have Wranglers on my booty.
16. I don't ride my horse only if I can't ride my horse more.
17. You can't tell me nothing, provided that my life is a movie.
18. If I take my horse to the old town road then my life is a movie, on the assumption that I have Wranglers on my booty
19. If I take my horse to the old town road, then my life is a movie assuming I have Wranglers on my booty
20. If I have horses in the back, then if I don't take my horse to the old town road, I can't ride my horse.