

This is just a practice quiz.

For each of the following strings of characters:

- a. Prove that it is a sentence of PL.
- b. Identify its major operator.

1. $((A \vee B) \wedge (A \supset B))$

- i. A and B are sentences of PL. (Rule 0)
- ii. $(A \vee B)$ is a sentence of PL. (rule 2, i)
- iii. $(A \supset B)$ is a sentence of PL. (rule 2, i)
- iv. $((A \vee B) \wedge (A \supset B))$ is a sentence of PL. (rule 2, ii, iii)

2. $\neg(\neg A \supset B)$

- i. A and B are sentences of PL. (Rule 0)
- ii. $\neg A$ is a sentence of PL. (rule 1, i)
- iii. $(\neg A \supset B)$ is a sentence of PL. (rule 2, i, ii)
- iv. $\neg(\neg A \supset B)$ is a sentence of PL. (rule 1, iii)

3. $((A \vee (B \wedge C)) \supset A)$

- i. A, B, and C are sentences of PL. (Rule 0)
- ii. $(B \wedge C)$ is a sentence of PL. (Rule 2, i)
- iii. $(A \vee (B \wedge C))$ is a sentence of PL. (Rule 2, i, ii)
- iv. $((A \vee (B \wedge C)) \supset A)$ is a sentence of PL. (Rule 2, i, iii)

Translate the following English language sentences into sentences of PL.

When doing so, make use of the following translation key.

A = The computer is broken.
B = The mechanic fixed the computer.
C = Someone called the mechanic.

4. The computer is not broken only if the mechanic fixed the computer.

$(\neg A \supset B)$

5. If the computer is broken, then either someone did not call the mechanic or the mechanic did not fix the computer.

$(A \supset (\neg C \vee \neg B))$

6. Either the computer is broken, or the computer is not broken and someone called the mechanic.

$(A \vee (\neg A \wedge C))$

Translate the following English language sentences into sentences of PL.

When doing so, make use of the following translation key.

$$X = 5 + n + m = 7$$

$$Y = n = 2$$

$$Z = m = 0$$

$$W = n = 1$$

$$Q = m = 1$$

7. $5 + n + m = 7$, if $n = 2$ and $m = 0$.

$$((Y \wedge Z) \supset X)$$

8. If either $n = 2$ and $m = 0$ or $n = 1$ and $m = 1$, then $5 + n + m = 7$.

$$(((Y \wedge Z) \vee (W \wedge Q)) \supset X)$$

9. It's not the case that $5 + n + m = 7$, if $n = 2$ but $m = 1$.

$$(Y \wedge Q) \supset \neg X$$