

Hint sequences by state:

$$G \vee F \& L \rightarrow M \& N \vee \neg F \& \neg N$$

Start

Recall the two things that determine the order in which we insert missing parentheses:
1) The order of precedence of the connectives
(\neg , $\&$, \vee , \rightarrow)
2) The convention that if there are multiple occurrences of a given connective, we insert parentheses around the rightmost occurrence first.

Since we never insert parentheses around negations, the connective with the highest precedence, the first connective around which parentheses should be inserted is conjunction, the connective with the next highest precedence.

There is more than one occurrence of a conjunction symbol in this formula, so the rightmost occurrence is the one around which the first pair of parentheses should be inserted.

2

Recall the order of precedence of the connectives:
(\neg , $\&$, \vee , \rightarrow)
You just finished inserting parentheses around the rightmost occurrence of conjunction.

If there are multiple occurrences of a given connective in a formula, parentheses should be inserted around all occurrences of that connective before moving on to consider the connective with the next highest precedence.

There are three conjunctions in this formula, so the next set of parentheses should be inserted around the middle conjunction.

3

Recall the order of precedence of the connectives:
(\neg , $\&$, \vee , \rightarrow)
You just inserted parentheses around the middle conjunction.

If there are multiple occurrences of a given connective in a formula, parentheses should be inserted around all occurrences of that connective before moving on to consider the connective with the next highest precedence.

There are three disjunctions in this formula, and you've already inserted parentheses around two of them, so the next set of parentheses should be inserted around the remaining conjunction.

4

Recall the order of precedence of the connectives:
(\neg , $\&$, \vee , \rightarrow)
You just finished inserting parentheses around all the occurrences of conjunction.

If there are multiple occurrences of a given connective in a formula, parentheses should be inserted around the rightmost occurrence first.

There are two disjunction in this formula, so the next set of parentheses should be inserted around the rightmost disjunction.

5

Recall the order of precedence of the connectives:
(\neg , $\&$, \vee , \rightarrow)
You just inserted parentheses around the rightmost disjunction.

If there are multiple occurrences of a given connective in a formula, parentheses should be inserted around the rightmost occurrence first.

There are two disjunctions in this formula, and you've already inserted parentheses around one of them, so the next set of parentheses should be inserted around the next rightmost conditional.

6

Recall the order of precedence of the connectives:
(\neg , $\&$, \vee , \rightarrow)
You just finished inserting parentheses around all the occurrences of disjunction.

There is only a single occurrence of a conditional in this formula, so that is the connective around which the next pair of parentheses should be inserted.