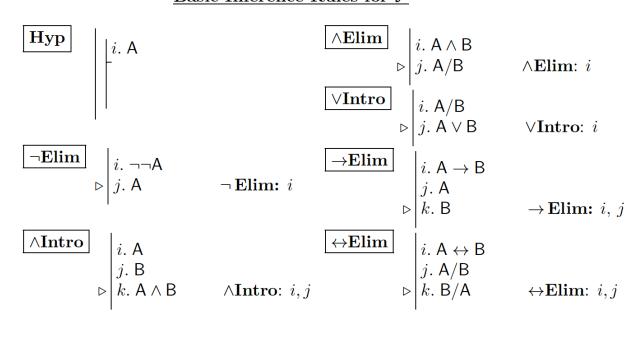
## Truth Definitions:

- $\neg \mathbf{T}$ : A negation of the form  $\lceil \neg A \rceil$  is true in an interpretation  $\mathcal{I}$  just in case A is false in  $\mathcal{I}$ .
- $\wedge \mathbf{T}$ : A conjunction of the form  $\lceil (A \wedge B) \rceil$  is true in an interpretation  $\mathcal{I}$  just in case A is true in  $\mathcal{I}$  and B is true in  $\mathcal{I}$ .
- $\vee \mathbf{T}$ : A disjunction of the form  $\lceil (A \vee B) \rceil$  is true in an interpretation  $\mathcal{I}$  just in case either A is true in  $\mathcal{I}$  or B is true in  $\mathcal{I}$ .
- $\to$ **T**: A material conditional of the form  $\lceil (A \to B) \rceil$  is true in an interpretation  $\mathcal{I}$  just in case either A is false in  $\mathcal{I}$  or B is true in  $\mathcal{I}$ .
- $\leftrightarrow$ **T**: A material bi-conditional of the form  $\lceil (A \leftrightarrow B) \rceil$  is true in an interpretation  $\mathcal{I}$  just in case either  $(A \text{ is true in } \mathcal{I} \text{ and } B \text{ is true in } \mathcal{I})$  or  $(A \text{ is false in } \mathcal{I} \text{ and } B \text{ is false in } \mathcal{I})$ .

## **Derivative Falsity Definitions:**

- $\neg$ **F**: A negation of the form  $\lceil \neg A \rceil$  is false in an interpretation  $\mathcal{I}$  just in case A is true in  $\mathcal{I}$ .
- $\wedge \mathbf{F}$ : A conjunction of the form  $\lceil (A \wedge B) \rceil$  is false in an interpretation  $\mathcal{I}$  just in case either A is false in  $\mathcal{I}$  or B is false in  $\mathcal{I}$ .
- $\vee \mathbf{F}$ : A disjunction of the form  $\lceil (A \vee B) \rceil$  is false in an interpretation  $\mathcal{I}$  just in case both A is false in  $\mathcal{I}$  and B is false in  $\mathcal{I}$ .
- $\to$ **F**: A material conditional of the form  $\lceil (A \to B) \rceil$  is false in an interpretation  $\mathcal{I}$  just in case A is true in  $\mathcal{I}$  and B is false in  $\mathcal{I}$ .
- $\leftrightarrow$ **F**: A material bi-conditional of the form  $\lceil (A \leftrightarrow B) \rceil$  is false in an interpretation  $\mathcal{I}$  just in case either  $(A \text{ is true in } \mathcal{I} \text{ and } B \text{ is false in } \mathcal{I})$  or  $(A \text{ is false in } \mathcal{I} \text{ and } B \text{ is true in } \mathcal{I})$ .

## Basic Inference Rules for $\mathcal{F}$



## Conditional Inference Rules for $\mathcal{F}$

