

# Summary of Rules

## Propositional rules ( $\mathcal{F}_T$ )

### Conjunction Introduction ( $\wedge$ Intro)

$$\begin{array}{|l} P_1 \\ \Downarrow \\ P_n \\ \vdots \\ \triangleright P_1 \wedge \dots \wedge P_n \end{array}$$

### Conjunction Elimination ( $\wedge$ Elim)

$$\begin{array}{|l} P_1 \wedge \dots \wedge P_i \wedge \dots \wedge P_n \\ \vdots \\ \triangleright P_i \end{array}$$

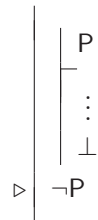
### Disjunction Introduction ( $\vee$ Intro)

$$\begin{array}{|l} P_i \\ \vdots \\ \triangleright P_1 \vee \dots \vee P_i \vee \dots \vee P_n \end{array}$$

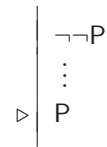
### Disjunction Elimination ( $\vee$ Elim)

$$\begin{array}{|l} P_1 \vee \dots \vee P_n \\ \vdots \\ \begin{array}{|l} P_1 \\ \hline \vdots \\ S \end{array} \\ \Downarrow \\ \begin{array}{|l} P_n \\ \hline \vdots \\ S \end{array} \\ \vdots \\ \triangleright S \end{array}$$

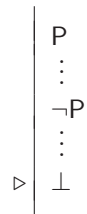
**Negation Introduction**  
( $\neg$  Intro)



**Negation Elimination**  
( $\neg$  Elim)



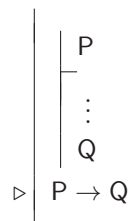
**$\perp$  Introduction**  
( $\perp$  Intro)



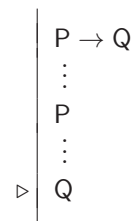
**$\perp$  Elimination**  
( $\perp$  Elim)



**Conditional Introduction**  
( $\rightarrow$  Intro)



**Conditional Elimination**  
( $\rightarrow$  Elim)



## Biconditional Introduction ( $\leftrightarrow$ Intro)

$$\triangleright \quad \begin{array}{|l} P \\ \hline \vdots \\ Q \\ \hline Q \\ \hline \vdots \\ P \end{array} \quad P \leftrightarrow Q$$

### Biconditional Elimination ( $\leftrightarrow$ Elim)

P	↔ Q (or Q ↔ P)
⋮	
P	
⋮	
Q	

## Reiteration (Reit)

$$\begin{array}{c|c} & P \\ \hline \triangleright & P \\ & \vdots \\ & P \end{array}$$

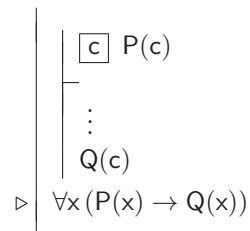
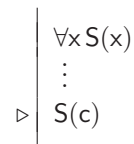
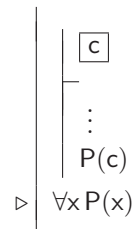
### First-order rules ( $\mathcal{F}$ )

## Identity Introduction (= Intro)

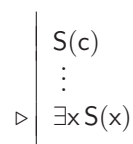
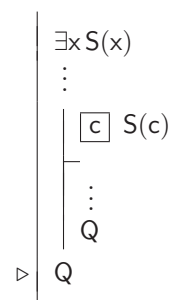
$$\triangleright \mid n = n$$

## Identity Elimination (= Elim)

$$\triangleright \left| \begin{array}{c} P(n) \\ \vdots \\ n = m \\ \vdots \\ P(m) \end{array} \right.$$

**General Conditional Proof  
( $\forall$  Intro)****Universal Elimination  
( $\forall$  Elim)****Universal Introduction  
( $\forall$  Intro)**

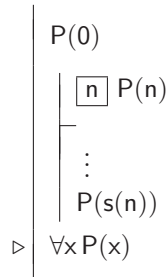
where  $c$  does not occur outside the subproof where it is introduced.

**Existential Introduction  
( $\exists$  Intro)****Existential Elimination  
( $\exists$  Elim)**

where  $c$  does not occur outside the subproof where it is introduced.

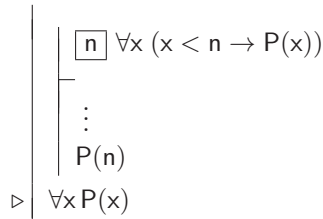
## Induction rules

### Peano Induction:



Where  $n$  does not occur outside the subproof where it is introduced.

### Strong Induction:



Where  $n$  does not occur outside the subproof where it is introduced.

## Inference Procedures (**Con** Rules)

Fitch also contains three, increasingly powerful inference procedures. They are not technically inference rules.

### Tautological Consequence (**Taut Con**)

**Taut Con** allows you to infer any sentence that follows from the cited sentences in virtue of the meanings of the truth-functional connectives alone.

### First-order Consequence (**FO Con**)

**FO Con** allows you to infer any sentence that follows from the cited sentences in virtue of the meanings of the truth-functional connectives, the quantifiers and the identity predicate.

### Analytic Consequence (**Ana Con**)

In theory, **Ana Con** should allow you to infer any sentence that follows

from the cited sentences in virtue of the meanings of the truth-functional connectives, the quantifiers, the identity predicate and the blocks language predicates. The Fitch implementation of **Ana Con**, however, does not take into account the meaning of **Adjoins** or **Between** due to the complexity these predicates give rise to.