Logic Supplementary Slides

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Some Hints on Constructing Proofs

Suppose we want to prove

S |- W

S set of wffs, W a wff.

- Look at the structure of W – table on slide 3.
- Look where W occurs in S - table on slide 4. Here W is sub-formula of Q.

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Principle connective of W	W is of the form	Inference rule to consider	Subgoals
$\rightarrow$	$A \rightarrow B$	$\rightarrow$I	Assume A Show B
$\wedge$	$A \wedge B$	$\wedge$ I	Show A and Show B
$\leftrightarrow$	$A \leftrightarrow B$	$\leftrightarrow$ I	Show A$\rightarrow$B and Show B$\rightarrow$A
$\vee$	$A \vee B$	$\vee$I or RAA	Show A or Show B Assume $\neg$ (A $\vee$ B) Show inconsistency
$\neg$	$\neg$ A	RAA	Assume A Show inconsistency

3

In S we have	Inference rule to consider	Subgoals
P$\rightarrow$W P$\rightarrow$Q	$\rightarrow$E	Show P Then apply $\rightarrow$E
W$\vee$P, P$\vee$W Q$\vee$P, P$\vee$Q	$\vee$E	Show $\neg$P Then apply $\vee$E
W$\wedge$P, P $\wedge$ W Q$\wedge$P, P$\wedge$Q	$\wedge$E	----
P $\leftrightarrow$ W P $\leftrightarrow$ Q	$\leftrightarrow$E	----
$\neg$W $\rightarrow$ P	RAA	----

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Desperate?
No Idea which inference Rule to Use?

Try RAA.

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