A (Assumption Introduction)

Can infer:
$\mathsf{s} \vdash \mathsf{s}$

$\wedge$E (Conjunction Elimination)

Given:
$\Lambda \vdash \mathsf{s}_1 \wedge \mathsf{s}_2$

can infer:
$\Lambda \vdash \mathsf{s}_1$ (as well as $\Lambda \vdash \mathsf{s}_2$)

$\wedge$I (Conjunction Introduction)

Given:
$\Lambda_1 \vdash \mathsf{s}_1$
$\Lambda_2 \vdash \mathsf{s}_2$

can infer:
$\Lambda_1, \Lambda_2 \vdash \mathsf{s}_1 \wedge \mathsf{s}_2$

$\vee$E (Disjunction Elimination)

Given:
$\Lambda_1 \vdash \mathsf{s}_1 \vee \mathsf{s}_2$
$\Lambda_2, \mathsf{s}_1 \vdash \mathsf{s}_3$
$\Lambda_3, \mathsf{s}_2 \vdash \mathsf{s}_3$

can infer:
$\Lambda_1, \Lambda_2, \Lambda_3 \vdash \mathsf{s}_3$

$\vee$I (Disjunction Introduction)

Given:
$\Lambda \vdash \mathsf{s}_1$

can infer:
$\Lambda \vdash \mathsf{s}_1 \vee \mathsf{s}_2$ (also $\Lambda \vdash \mathsf{s}_2 \vee \mathsf{s}_1$)

$\supset$E (Conditional Elimination)

Given:
$\Lambda_1 \vdash \mathsf{s}_1 \supset \mathsf{s}_2$
$\Lambda_2 \vdash \mathsf{s}_1$

can infer:
$\Lambda_1, \Lambda_2 \vdash \mathsf{s}_2$

$\supset$I (Conditional Introduction)

Given:
$\Lambda, \mathsf{s}_1 \vdash \mathsf{s}_2$

can infer:
$\Lambda \vdash \mathsf{s}_1 \supset \mathsf{s}_2$

$\neg$E (Negation Eliminations)

Given:
$\Lambda \vdash \neg\neg\mathsf{s}$

can infer: $\Lambda \vdash \mathsf{s}$

$\neg$I (Negation Introduction)

Given:
$\Lambda_1, \mathsf{s}_1 \vdash \mathsf{s}_2$
$\Lambda_2, \mathsf{s}_1 \vdash \neg\mathsf{s}_2$

can infer: $\Lambda_1, \Lambda_2 \vdash \neg\mathsf{s}_1$

Applying Inference Rules

- Pay attention to the main connectives of the succedents:
  - The elimination rules are named after the main connective in the succedent of one of the sequents to be used.
  - The introduction rules are named after the main connective in the succedent of the sequent to be inferred.
- Pay attention to the datums especially for $\vee$E, $\neg$I, $\supset$I.
- In annotation, make sure the count of lines you reference matches the count of lines required by the inference rule you are using.

Finding Derivations

- Given a target sequent, consult the main connective of the succedent of target and consider which inference rules enable you to get that succedent. That can tell you which intermediate conclusion would be needed.
- Given one or more premises, consider the main connectives of their succedents and see which inferences are possible proceeding from them.
- Consider what the problem is asking you to do by translating the formalism into English. That sometimes helps in finding an outline for a formal derivation.
- (with $\neg$I) Try assuming the negation of the succedent of the target sequent. The last steps of the derivation will involve $\neg$I.