

Baronett's *Logic* (4th ed.)
Section Tips

Chapter 8: Seven Tips

8B Implication Rules I

- Think of the first four rules of inference as rules allowing you to create complex statements (Hypothetical Syllogism), or break them apart (*Modus Ponens*, *Modus Tollens*, and Disjunctive Syllogism).

8D Implication Rules II

- The second four inference rules allow you to create complex statements (Conjunction and Addition), or break them apart (Constructive Dilemma and Simplification).
- Don't be intimidated by the complexity of Constructive Dilemma. It's basically two instances of *Modus Ponens*:

Separate out the left side of dot in Premise 1, the left side of wedge in Premise 2, and the left side of wedge in the conclusion:

$$\begin{array}{l} p \supset q \\ \underline{p} \\ q \end{array}$$

Now do the same for the right side of the main operator in Premise 1, the right side of wedge in Premise 2, and the right side of wedge in the conclusion:

$$\begin{array}{l} r \supset s \\ \underline{r} \\ s \end{array}$$

In both cases, you've got *Modus Ponens*! Now, if it's true that you have both $p \supset q$ **and** $r \supset s$, and you have p **or** r , it follows that you have q **or** s .

8E Replacement Rules I and 8F Replacement Rules II

- Think about De Morgan's as instances of "pushing the negation through" and swapping out wedge for dot or dot for wedge.

- Remember, logically equivalent statements are those that *logically mean the same thing*. So, for example, to assert one statement, $p \bullet q$ is to assert its logically equivalent statement, $q \bullet p$.
- Association involves moving a pair of parentheses from one conjunction in a complex sentence to another conjunction in the same sentence. The same applies to a sentence involving more than one disjunction.
- If you're uncertain about whether or not a replacement rule really reflects logical equivalence (and some may be counterintuitive), construct a truth table. Use your knowledge of logical equivalence from Chapter 7F.