Inferencing involving Assumptions

- **Assumption:** Axiom that tentatively introduced.
  - Will be denoted by placing sq. brackets around it.
  - Also all deductions using it will be indented.

- **Reduction to absurdity:**

$$\frac{\begin{array}{c}[p]\\ \text{FALSE}\end{array}}{\neg p}$$

Assuming p to be TRUE, later established FALSE, then $\neg p$ holds.

- **$\rightarrow$ introduction:**

$$\frac{\begin{array}{c}[p]\\ q\end{array}}{p \rightarrow q}$$

Assuming p to be TRUE, later establishes q, then $p \rightarrow q$ holds.

- **Example:** Prove $((p \vee q) \wedge \neg p) \rightarrow q$

1.	$[(p \vee q) \wedge \neg p)]$	assumption
2.	$p \vee q$	$\wedge$ elimination in 1
3.	$\neg p$	$\wedge$ elimination in 1
4.	$p \rightarrow q$	vacuous proof from 3.
5.	$q \rightarrow q$	tautology
6.	q	case analysis from 2,4,5
7.	$((p \vee q) \wedge \neg p) \rightarrow q$	$\rightarrow$ introduction from 1,6