5)

1) $(P \to q) \wedge (P \to n) \iff P \to q \wedge n$

$(\sim P \vee q) \wedge (\sim P \vee n) \iff$

$\sim P \vee (q \wedge n) \iff$

$\sim P \vee q \wedge n \qquad \iff$

$P \to q \wedge n \iff$

$\#$

6) $P \uparrow q \iff ((P \downarrow P) \downarrow (q \downarrow q)) \downarrow ((P \downarrow P) \downarrow (q \downarrow q))$

$((P \downarrow P) \downarrow (q \downarrow q)) \downarrow ((P \downarrow P) \downarrow (q \downarrow q)) \iff$

$[(\sim P \wedge \sim P) \downarrow (\sim q \wedge \sim q)] \downarrow [(\sim P \wedge \sim P) \downarrow (\sim q \wedge \sim q)] \iff$

$[(\sim(P \wedge P) \downarrow (\sim(q \wedge q)] \downarrow [(\sim(P \wedge P)) \downarrow (\sim(q \wedge q))] \iff$

$[(\sim P) \downarrow (\sim q)] \downarrow [(\sim P) \downarrow (\sim q)] \iff$

$[P \wedge q] \downarrow [P \wedge q] \iff$

$$\left[\sim(P \land q)\right] \land \left[\sim(P \land q)\right] \iff$$

$$\left[\sim P \lor \sim q\right] \land \left[\sim P \lor \sim q\right] \iff$$

$$(P \uparrow q) \land (P \uparrow q) \iff$$

$$(P \uparrow q) \iff$$

$$\#$$