

Valuation Tree

Sept 19.

$$(((P \wedge Q) \rightarrow (\neg r)) \wedge (P \rightarrow Q)) \rightarrow (P \rightarrow (\neg r))$$

$$t(P)=T$$

$$~~P=F~~$$

$$t(P)=F$$

$$~~P=F~~$$

$$(((T \wedge Q) \rightarrow (\neg r)) \wedge (T \rightarrow Q)) \rightarrow (T \rightarrow (\neg r))$$

$$\equiv (((Q \rightarrow (\neg r)) \wedge Q) \rightarrow (\neg r))$$

$$t(Q)=F$$

$$~~Q=F~~$$

$$t(Q)=T$$

$$~~Q=F~~$$

$$(((F \rightarrow (\neg r)) \wedge F) \rightarrow (\neg r))$$

$$\equiv ((T \wedge F) \rightarrow (\neg r))$$

$$\equiv (F \rightarrow (\neg r))$$

$$\equiv T$$

$$(((T \rightarrow (\neg r)) \wedge T) \rightarrow (\neg r))$$

$$\equiv (((\neg r) \wedge T) \rightarrow (\neg r))$$

$$\equiv ((\neg r) \rightarrow (\neg r))$$

$$\equiv T$$

$$(((F \wedge Q) \rightarrow (\neg r)) \wedge (F \rightarrow Q)) \rightarrow (F \rightarrow (\neg r))$$

$$\equiv (((F \rightarrow (\neg r)) \wedge T) \rightarrow T)$$

$$\equiv T$$

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$$(((P \wedge Q) \rightarrow (\neg r)) \wedge (P \rightarrow Q)) \rightarrow (P \rightarrow (\neg r))$$

$$\begin{array}{l} \cancel{r=T} \\ t(r)=T \end{array}$$

$$\begin{array}{l} \cancel{r=F} \\ t(r)=F \end{array}$$

$$\begin{array}{l} (((P \wedge Q) \rightarrow F) \wedge (P \rightarrow Q)) \rightarrow (P \rightarrow F) \\ \equiv (((\neg(P \wedge Q)) \wedge (P \rightarrow Q)) \rightarrow (\neg P)) \end{array}$$

$$\begin{array}{l} \cancel{P=T} \\ t(P)=T \end{array}$$

$$\begin{array}{l} \cancel{P=F} \\ t(P)=F \end{array}$$

$$\begin{array}{l} (((\neg(T \wedge Q)) \wedge (T \rightarrow Q)) \rightarrow F) \\ \equiv (((\neg Q) \wedge Q) \rightarrow F) \\ \equiv (F \rightarrow F) \\ \equiv T \end{array}$$

$$\begin{array}{l} (((\neg(F \wedge Q)) \wedge (F \rightarrow Q)) \rightarrow T) \\ \equiv T \end{array}$$

$$\begin{array}{l} (((P \wedge Q) \rightarrow T) \wedge (P \wedge Q)) \rightarrow (P \rightarrow T) \\ \equiv (((P \wedge Q) \rightarrow T) \wedge (P \wedge Q)) \rightarrow T \\ \equiv T \end{array}$$

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$$(((P \wedge Q) \rightarrow (\neg r)) \wedge (P \rightarrow Q)) \rightarrow (P \rightarrow (\neg r))$$

$$\begin{array}{l} \cancel{P=T} \\ t(P)=T \end{array}$$

$$\begin{array}{l} \cancel{P=F} \\ t(P)=F \end{array}$$

$$(((T \wedge Q) \rightarrow (\neg r)) \wedge (T \rightarrow Q)) \rightarrow (T \rightarrow (\neg r))$$

$$\equiv (((Q \rightarrow (\neg r)) \wedge Q) \rightarrow (\neg r))$$

$$\begin{array}{l} \cancel{r=T} \\ t(r)=T \end{array}$$

$$\begin{array}{l} \cancel{r=F} \\ t(r)=F \end{array}$$

$$(((Q \rightarrow F) \wedge Q) \rightarrow F)$$

$$(((Q \rightarrow T) \wedge Q) \rightarrow T)$$

$$\equiv (((\neg Q) \wedge Q) \rightarrow F)$$

$$\equiv T$$

$$\equiv (\neg ((\neg Q) \wedge Q))$$

$$\equiv (\neg (F))$$

$$\equiv T$$

$$(((F \wedge Q) \rightarrow (\neg r)) \wedge (F \rightarrow Q)) \rightarrow (F \rightarrow (\neg r))$$

$$\equiv (((F \rightarrow (\neg r)) \wedge T) \rightarrow T)$$

$$\equiv T$$