

TU 152

Example 1: Prove that if  $u \vee (r \rightarrow t)$  and  $\sim u \wedge \sim t$ , then  $\sim r$

Example 2: Prove that if  $x \rightarrow (y \rightarrow z)$ ,  $\sim y \rightarrow \sim x$ , and  $x$ , then  $z$

Example 3: Prove that if  $\sim p \rightarrow \sim q$ ,  $\sim u$ ,  $p \rightarrow t$ , and  $q \vee u$ , then  $t$

Example 4: Show  $\sim t$  if  $[r \rightarrow (s \rightarrow \sim t)] \wedge [(\sim s \rightarrow \sim r) \wedge r]$

Example 5: Prove that if  $(\sim x \vee \sim y) \rightarrow (z \wedge w)$ ,  $z \rightarrow t$ , and  $\sim t$ , then  $x$

Example 6: Prove that if  $(\sim a \vee b) \rightarrow c$ ,  $\sim c \vee d$ , and  $d \rightarrow \sim (e \vee \sim e)$ , then  $a$

Example 7: Prove that if  $x \vee \sim y$ , and  $z \rightarrow \sim (x \vee t)$ , then  $y \rightarrow \sim z$

Example 8: Prove that if  $[a \vee (b \rightarrow c)] \wedge (b \vee e)$ , then  $\sim a \rightarrow (\sim c \rightarrow e)$

Example 9: Prove that if  $(\sim x \wedge y) \rightarrow \sim z$ ,  $\sim (x \vee y) \rightarrow w$ , and  $\sim x$ , then  $\sim z \vee w$

Example 10: Prove that if

$a \vee (b \wedge \sim c)$ ,  $\sim a$ ,  $b \rightarrow (d \rightarrow e)$ , and  $\sim c \rightarrow (x \rightarrow y)$ , then  $[a \vee x \vee d] \rightarrow (y \vee e)$

Example 11: Prove that if

$a \rightarrow (b \wedge c)$ ,  $(d \wedge c) \rightarrow (e \wedge \sim a)$ ,  $a \vee (d \rightarrow \sim e)$ , and  $d \wedge (b \rightarrow e)$ , then  $\sim e \leftrightarrow \sim a$

Example 12: Prove that if  $[\sim (s \wedge r) \vee s \vee p] \rightarrow (s \wedge t)$ , then  $t$

Example 13: Prove that if  $a \vee b \vee c$ ,  $\sim (d \wedge e) \rightarrow \sim (f \vee a)$ , and  $(c \rightarrow a) \wedge (\sim b \vee f)$ , then  $d$

Example 14: Prove that if  $\sim (p \rightarrow q)$ ,  $(p \wedge r) \rightarrow (s \rightarrow q)$ , and  $(\sim r \rightarrow q) \vee (p \rightarrow s)$ , then  $r \leftrightarrow \sim s$

Example 15: Show that for every natural number  $n$ ,  $n < 2^n$