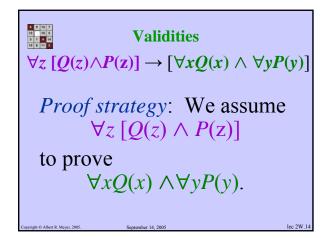
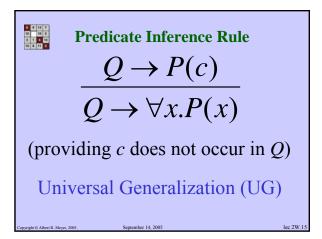


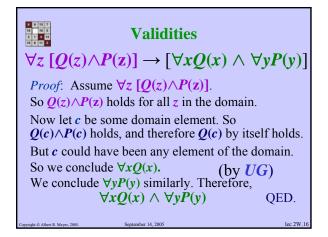
Not Valid

$$\forall z [Q(z) \lor P(z)] \rightarrow [\forall x Q(x) \lor \forall y P(y)]$$

Proof: Give *countermodel*, where
 $\forall z [Q(z) \lor P(z)]$ is true,
but $\forall x Q(x) \lor \forall y P(y)$ is false.
Namely, let domain ::= { e, π },
 $Q(z) ::= [z = e],$
 $P(z) ::= [z = \pi].$







More Validities $\forall x [P(x) \lor A] \leftrightarrow [\forall x P(x)] \lor A$ (providing *x* not in *A*) $[\neg \forall x P(x)] \leftrightarrow [\exists x \neg P(x)]$

