

$$\begin{aligned} & \exists x \forall y (p(x, y) \rightarrow p(y, x)) \vee \exists x \forall y ( \\ & p(x, y) \rightarrow \exists x \forall y \exists z (p(x, z) \vee p(z, y)) \end{aligned}$$

$$| \forall x \forall y (p(x, y) \rightarrow p(y, x)) |$$

$$2. \exists x \forall y (p(x, y))$$

3 For all  $\text{dim}, 1 \quad p(a, b) \rightarrow p(b, a)$

4. For all elem,  $\exists \exists \text{oe}, p(x, a)$

5.  $\rightarrow$  elem, 3  $p(b, a)$

6. A intro 4,5  $\exists x p(x, a) \wedge p(a, x)$

7. forall intro, 6 HYVZ  $\exists x p(x, z) \wedge p(z, y)$