

*introduction*

*elimination*

$$= \frac{}{t = t} =^i \quad \frac{t_1 = t_2 \quad \Phi[t_1/x]}{\Phi[t_2/x]} =_e$$

$$\forall \quad \frac{x_0: \begin{array}{c} \vdots \\ \Phi[x_0/x] \end{array} \quad \forall x i}{\forall x \Phi} \quad \frac{\forall x \Phi}{\Phi[t/x]} \forall x e$$

$$\exists \quad \frac{\Phi[t/x]}{\exists x \Phi} \exists x i \quad \frac{\exists x \Phi \quad \boxed{x_0: \Phi[x_0/x] \quad \vdots \quad \chi}}{\chi} \exists x e$$

**Figure:** Natural deduction rules for predicate logic