(1) ∀x∃y(F(x)∧G(y,z))∧∃z(H(z)∧L(x,y,z))  
⇔∀x∃y∃z(F(x)∧G(y,z)∧H(z)∧L(x,y,z))  
(2) ∃x(F(x,y,z)∧∃y(G(y)→H(x,y,z)))∨L(x,y,z,s)  
⇔∃x(F(x,y,z)∧∃y(¬G(y)∨H(x,y,z)))∨L(x,y,z,s)  
⇔∃x∃y(F(x,y,z)∧(¬G(y)∨H(x,y,z)))∨L(x,y,z,s)  
设谓词公式 F (x) 中都是自由出现，G 中无 x 的自由出现，证明：  
(1) ∃x (F (x)→G)⇔∀xF (x)→G  
∃x (F (x)→G)  
⇔∃x (¬F (x)∨G)  
⇔¬∀xF (x)∨G  
⇔∀xF (x)→G  
(2) ∃x (G→F (x))⇔G→∃xF (x)  
∃x (G→F (x))  
⇔¬G∨∃xF (x)  
⇔G→∃xF (x)  
设个体域 S 为有限集，S = {a1,a2,a3}，消去下列谓词公式中的量词。  
(3) ∀x∃yF (x,y)  
⇔(F (a1,a1)∧F (a2,a1)∧F (a3,a1))∨(F (a1,a2)∧F (a2,a2)∧F (a3,a2))∨(F (a1,a3)∧F (a2,a3)∧F (a3,a3))  
(4) ∀x (F (x)∧G (x))→∃y (F (y)∨G (y))  
⇔∃x∃y (¬(F (x)∧G (x))∨F (y)∨G (y))  
⇔(¬F (a1)∨¬G (a1)∨F (a1)∨G (a1))∨(¬F (a1)∨¬G (a1)∨F (a2)∨G (a2))∨(¬F (a1)∨¬G (a1)∨F (a3)∨G (a3))∨(¬F (a2)∨¬G (a2)∨F (a1)∨G (a1))∨(¬F (a2)∨¬G (a2)∨F (a2)∨G (a2))∨(¬F (a2)∨¬G (a2)∨F (a3)∨G (a3))∨(¬F (a3)∨¬G (a3)∨F (a1)∨G (a1))∨(¬F (a3)∨¬G (a3)∨F (a2)∨G (a2))∨(¬F (a3)∨¬G (a3)∨F (a3)∨G (a3))⇔1