requires first the replacement of the object language names with their metalanguage equivalents, yielding:

$\forall$x(Fx*c* → x≠*c*).

Then expansion proceeds by the normal method, to yield:

(F*cc* → *c*≠*c*) & (F*dc* → *d*≠*c*).

Finally, given the predicate extension

F: {⟨*c, d*⟩, ⟨*d, c*⟩}

the conjunction can be seen to be true given the falsity of the antecedent of the left conditional and the truth of both antecedent and consequent on the right.

Exercise 4.4 Construct countermodels for the following sequents.

i*	a=b, c=d ⊢ a=c
ii	Fa, a≠b ⊢ ~Fb
iii	∀x∃y x=y ⊢ ∃y∀x y=x
iv	∃x(x≠a → Fx), a=b ⊢ Fb
v*	∃xy((Fx & Fy) & x ≠ y) ⊢ ∀xFx
vi	∀xy(Fx & Gy → x=y) ⊢ ~∃x(Fx & Gx)
vii	∃x(x≠a → Fx ∨ Gx) ⊢ ∃x(Fx ∨ Gx → x≠a)
viii	∀xy(Fxy → y=x) ⊢ ∃xFxx
ix*	∃x∀y(Fxy ↔ x≠y) ⊢ ∀xyz((Fxy & Fxz) → y=z)
x	∀xy((Fx & Fy) → x≠y) ⊢ ∀xyz(((Fx & Fy) & Fz) & ((x≠y & y≠z) & x≠z))