

Directions: Each proof is worth 5pts. You may use truth trees or natural deduction.

1. $\exists x Mxa \ \& \ \forall x (Mxa \rightarrow Kxa); \ \forall y (Kya \rightarrow (y = b \vee y = c)) \ \therefore \neg Kba \rightarrow Kca$

2. $\forall x \exists y g(f(x)) = f(g(y)); \ \exists x g(x) = g(f(x)) \ \therefore \exists x \exists y g(x) = f(g(y))$