

# Planning Proofs in Predicate Logic

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Classwork

## 1. A moral tale

Some rich men are kind. All kind men are loved. Therefore, some rich men are loved.

## 2. A humble beginning

$$(A \wedge B) \rightarrow C, B : A \rightarrow C$$

As a revision aid you might consider proving the above using a truth table.

## 3. Big Brother

$$\forall x [(Ax \wedge Bx) \rightarrow Cx], Ba : \exists x [Ax \rightarrow Cx]$$

Question: if the existential in the conclusion was an universal – would the sequent be valid?

## 4. Short & Sweet

$$\exists x [Fx] : \exists y [Fy]$$

(Hint: This problem introduces the use of “EI before EE” as a strategy for deriving existential conclusions from existential premises.)

## 5. No short cuts

$$\forall y [Gy \rightarrow Hy] : \exists x [Gx] \rightarrow \exists z [Hz]$$

(Compare this to  $\forall y [Gy \rightarrow Hy] : \exists x [Gx \rightarrow Hx]$  or even the propositional version)