Practice Third Examination (typo corrected on April 11, 2008)

Show that the following arguments are valid by providing a complete derivation for each.

Each derivation is worth 25 points.

Partial credit will be given for derivations that correctly do something that has the potential for leading to a complete derivation.

You will be penalized for misusing the rules. It is better to leave a derivation incomplete than to “complete” it by misusing the rules.

1. \( \forall x(Ax \lor \neg Bx). \ \forall y(Cy \leftrightarrow Ay). \ \text{Bm.} \ \therefore \exists yCy. \)

2. \( \exists x(Dx \land Fxa). \ \forall y(\exists zFyz \land \exists zGyz). \ \therefore \exists x \exists y(Dx \land Gxy) \)

3. \( \forall x(\exists yHyx \land \exists zKxz). \ \forall x \forall y(Kxy \land Jay). \ \therefore \forall x(\exists yHyx \land \exists y[Jay \land Kxy]) \)

4. \( \forall xNx \land \exists yPy. \ \therefore \exists x(Nx \land \exists yPy). \)