Philosophy 240: Symbolic Logic
Fall 2009

Hamilton College
Russell Marcus
rmarcus1@hamilton.edu

Identity Theory Jigsaw Lesson
Work Group: At Most

I. Translation key:

a: Andy; d: Dwight; g: Angela; m: Michael; o: the Office
Ax: x is an accountant; Ex: x is an employee; Mx: x is a regional manager; Px: x is a person
Axy: x is y's assistant; Bxy: x is bigger than y; Hxy: x has y; Ixy: x is in y; Kxy: x likes y

Note: 'At most' statements make no existential commitments.

II. Examine the translations below, which use the key in I.

1. At most one person is Michael's assistant.

   $(x)(y)[(Px \bullet Axm \bullet Py \bullet Aym) \supset x=y]$

2. At most two employees are accountants.

   $(x)(y)(z)[(Ex \bullet Ax \bullet Ey \bullet Ay \bullet Ez \bullet Az) \supset (x=y \vee x=z \vee y=z)]$

3. At most two people are Michael's assistants.

   $(x)(y)(z)[(Px \bullet Axm \bullet Py \bullet Aym \bullet Pz \bullet Azm) \supset (x=y \vee x=z \vee y=z)]$

4. There is at most one accountant in the office bigger than Dwight.

   $(x)(y)[(Ax \bullet Ixo \bullet Bxd \bullet Ay \bullet Iyo \bullet Byd) \supset x=y]$

5. At most two regional managers have employees bigger than Andy.

   $(x)(y)(z)\{[Mx \bullet (\exists w)(Ew \bullet Hxw \bullet Bwa) \bullet My \bullet (\exists w)(Ew \bullet Hyw \bullet Bwa) \bullet Mz \bullet (\exists w)(Ew \bullet Hzw \bullet Bwa)] \supset (x=y \vee x=z \vee y=z)\}$

III. Try these, using the key in I.

6. There is at most one accountant in the office.

7. There are at most three accountants in the office.

8. Some people like Angela, but at most two.