1 More practice

(Ask for extra paper if you need some!)

- 1. Using \forall and \exists where appropriate, write logical forms for the sentences below.
 - (a) Jones cleaned and framed every painting that Brice found in the cellar $\forall x \lceil [PAINTING(x) \& [FIND(b, x) \& IN(x, c)]] \rightarrow [CLEAN(j, x) \& FRAME(j, x)] \rceil$
 - (b) Chairman Miaou is heavier and meaner than any spaniel $\forall x [SPANIEL(x) \rightarrow [HEAVIER(m, x) \& MEANER(m, x)]]$
 - (c) Clive gave every child either a biscuit or a Batman comic (This means 'not both') $\forall x [\text{CHILD}(x) \rightarrow \exists y [\text{BISCUIT}(y) \& [\text{GIVE}(c,y,x) \lor \exists z [\text{BATMANCOMIC}(z) \& [\text{GIVE}(c,z,x) \& \neg [\text{GIVE}(c,y,x) \& \text{GIVE}(c,z,x)]]]]]]$
 - (d) Zoe read all the death notices but nothing else $\forall x [\text{READ}(z, x) \leftrightarrow \text{DEATHNOTICE}(x)]$
 - (e) If everyone leaves the room then the room will be empty $\forall x \lceil \text{PERSON}(x) \rightarrow \text{LEAVE}(x,r) \rceil \rightarrow \text{EMPTY}(r)$
 - (f) If someone leaves the cab the then Jones will put the luggage in the cab (It doesn't matter who leaves to make more space) $\exists x [PERSON(x) \& LEAVE(x,c)] \rightarrow PUT(j,l,\text{in } c)$
- 2. Using \forall and \exists where appropriate, write logical forms for the sentences below.
 - (a) Not everyone likes Bob Solution to be given in class
 - (b) Bob doesn't like anyone Solution to be given in class
- 3. The sentences below are scopally ambiguous. Give a clear unambiguous paraphrase for each reading and match it with its formula.
 - (a) Every prize was won by some kid Solution to be given in class
 - (b) Someone had scribbled on every wall Solution to be given in class