

**Quiz 3 - Math 374, Frank Thorne (thorne@math.sc.edu)**

**Friday, September 15, 2017**

- (1) Use appropriate predicate symbols and quantifiers to write the following English statement as a predicate wff.

Action movies are better than dramas.

Let the domain be the set of all movies, and write  $A(x)$  for the predicate ' $x$  is an action movie',  $D(x)$  for ' $x$  is a drama', and  $B(x, y)$  for ' $x$  is better than  $y$ '.

Then, the statement may be written in the form

$$\forall x [A(x) \rightarrow (\forall y (D(y) \rightarrow B(x, y)))]$$

Alternatively, it may be written in the form

$$\forall x \forall y (A(x) \wedge D(y) \rightarrow B(x, y))$$

- (2) Find an interpretation in which the following wff is true, and another one in which it is false.

$$\exists x [A(x) \wedge (\forall y) B(x, y)]$$

All sorts of examples are possible. One such:

- The domain is the set of positive integers;  $A(x)$  is the predicate ' $x$  is odd', and  $B(x, y)$  is ' $x \leq y$ '. Then the statement is true. If  $A(x)$  instead stands for ' $x$  is even', then the statement is false.