

# Math 2283 - Introduction to Logic

## Quiz #3 - 2017.01.18 Solutions

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1. If we consider only people in the classroom, determine which of the following quantified statements are true, and which are false.

(a)  $\forall x \exists y$  ( $x$  is taller than  $y$ )

This is false. Since it has to hold true for all  $x$ , what happens if we let  $x$  be the shortest person in the room? Then no  $y$  exists to make  $x$  taller than  $y$ .

(b)  $\exists x \forall y$  ( $x$  is taller than  $y$ )

This is also false, we cannot find a single person  $x$  that is taller than all  $y$ , since we have to compare the person  $x$  to themselves.

(c)  $\exists x, y$  ( $x$  is taller than  $y$ )

This is true, since not every person in class is of the same height, we can find one  $x$  which is taller than one  $y$ .

(d)  $\exists y \forall x$  ( $x$  is taller than  $y$ )

This is false, similar to part (b).

2. Write a (logical) sentence which contains at least two different logical connectives. You may be as creative as you wish.

Answers will vary, but here is an example:

If today is Wednesday, then you will be taking a quiz and handing in homework.