

Math 2283 - Introduction to Logic

Quiz #5 - 2012.08.31

Solutions

1. Determine which of the following sentences are true, and which are false.

(a) $\mathbf{A}_x \mathbf{E}_y (x \cdot y > 0)$

This statement is false (let $x = 0$).

(b) $\mathbf{A}_x \mathbf{E}_y (x \cdot y \geq 0)$

This statement is true.

(c) $\mathbf{A}_x \mathbf{A}_y (x \cdot y > 0)$

This statement is false. Let $x = 1$ and $y = -1$.

(d) $\mathbf{E}_x \mathbf{A}_y (x \cdot y = 0)$

This is true, let $x = 0$.

2. Define the mathematical relation $<$ based on the relation $>$, the logical relation $=$, and logical connectives.

We can define the relation $<$ with two numbers x and y as –
 $x < y$ if and only if it is not true that: $x > y$ or $x = y$.