Discrete Structures

NESTED QUANTIFIER - A quantifier within the scope of another quantifier.
Read from left to right

Domain: all integers

$$\underbrace{\forall x}_{\text{for all } x}\ \underbrace{\exists y}_{\text{there exists a } y \text{ such that}}\ \underbrace{\forall z}_{\text{for all } z}\ \underbrace{[(x+y) \times z = 0]}_{(x+y) \times z = 0}$$

It depends on x, y is its negation if $x = 1$, $y = -1$ — What is the value of y? True

Domain: all integers

Commutative law for addition

$$\forall x\ \forall y\ (x + y = y + x)$$

$$\forall x\ \forall y\ \forall z\ [(x + y) + z = x + (y + z)]$$

Discrete Structures

for all x there exists a y such that $a + y = 0$

Depends on x, y is its negation (if $x = 1$, $y = -1$)

$\forall x \exists y (x + y = 0)$

Transpose the Quantifiers

$\exists y \forall x (x + y = 0)$

There exists a y (one y) for all x, such that $x+y=0$
Truth value = None

P.g. 66-67 : 19 (a-d)

$((x < 0) \wedge (y < 0)) \rightarrow (x+y < 0)$

P.g. 67 : 29 (a-d)

$$P(1,1) \vee P(1,2) \vee P(1,3)$$
$$P(2,1) \vee P(2,2) \vee P(2,3)$$
$$P(3,1) \vee P(3,2) \vee P(3,3)$$