Translating Predicate Logic

Classwork

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Recap

Last week we introduced Predicate Logic and the use of ∀ and ∃. As a reminder:

∀x [Fx] = For all values of x, F is true of x
∃x [Fx] = There exists some x where F is true of that x

Fx where F is some property such as "... likes cheese"

We also presented two general rules for transforming natural language into predicate logic.

Universal Conditional
All As are Bs → ∀x [Ax → Bx]

Existentially qualified conjunction

Some As are Bs →∃x [Ax ∧ Bx]

Negation

Negation has a special importance in predicate logic. Consider how to represent:

There are no unicorns

Translating Natural Language into Predicate Logic

Something is A

Nothing is A

Everything is A

Some As are Bs

All As are Bs

No As are Bs

Relationships 1

Convert the following into predicate logic:

John loves Mary

Everybody hates Chris

Somebody loves Chris

John loves everybody

John loves somebody

Nobody loves John

Mary doesn't love anybody & John loves Mary

Mary hates Chris but Chris loves Mary

Mary doesn't love everybody or somebody doesn't love Mary

If Mary loves everybody then somebody doesn't love Mary and Mary loves somebody

Relationships 2

Everybody loves everybody

Everybody loves somebody

Everyone loves themselves

Everybody loves anybody with red hair

All Virgos love Taurens

All Virgos love a Leo

Everybody has a mother therefore somebody is the mother of everyone.