CONSERVATIVITY

'Every vampire yawns' is equivalent to 'Every vampire is a vampire who yawns'
A B A A∩B

A $[\![\text{vampire}]\!]^s = \{a, b, c\}$

B $[\![\text{yawns}]\!]^s = \{a, b, c, ab, bc, ac, abc\}$

'Every vampire yawns' is true if $A \subseteq B$ (✓)

'Every vampire is a vampire who yawns' is true if $A \subseteq (A \cap B)$ (✓)

If it is true that $A \subseteq B$, then intersecting A w/ B = A, and $A \subseteq A$.

If it is true that $A \subseteq (A \cap B)$, then A is also a subset of B, so $A \subseteq B$.

'Somenon vampire yawns' is not equivalent to 'Somenon vampire is a vampire who yawns'
A B A A∩B

↳ true if something not in A is in B: eg., bc

↳ true if something not in A is in A∩B, but this is impossible.

SYMMETRY

'Some dogs (A) snore (B)' is equivalent to 'Some snorers (B) are dogs (A)'

A: $[\![\text{dogs}]\!]^s = \{ab, bc, ac, abc\}$

B: $[\![\text{snore}]\!]^s = \{b, c, d, bc, bd, \ldots bcd\}$

→ true if $A \cap B \neq \emptyset$

$A \cap B = \{bc\}$ ✓

B · $[\![\text{snorers}]\!]^s = \{bc, bd, \ldots bcd\}$

→ true if $B \cap A \neq \emptyset$

$B \cap A = \{bc\}$ ✓

'Every dog (A) snores (B)' is not equivalent to 'Every snorer (B) is a dog (A)'

→ true if $A \subseteq B$

A: $[\![\text{dogs}]\!]^s = \{a, b, c\}$

B: $[\![\text{snores}]\!]^s = \{a, b, c, ab, bc, ac, abc, \ldots, abcd\}$

A indeed is a subset of B

B: $[\![\text{snorer}]\!]^s = \{a, b, c, d\}$

→ true if $B \subseteq A$, but

$\{a, b, c, d\} \not\subseteq \{a, b, c\}$

The Royal Foundation of St Katharine
An extraordinary urban oasis

MONOTONICITY

'Some [vampire]^{B} yawns'

↑

'Some [blonde vampire]^{A} yawns'

$[\![\text{blonde v.}]\!]^{s}_{A} \subseteq [\![\text{vampire}]\!]^{s}_{B}$

'Some' is ↑L

↑L

'Some vampire [yawns]^{B}'

↑

Some vampire [yawns noisily]^{A}

$[\![\text{yawns noisily}]\!]^{s}_{A} \subseteq [\![\text{yawns}]\!]^{s}_{B}$

↑R

Every vampire [yawns]^{B}

↑

Every vampire [yawns noisily]^{A}

Every [vampire]^{B} yawns

↓

Every [blonde vampire]^{A} yawns

$[\![\text{blonde v.}]\!]^{s}_{A} \subseteq [\![\text{vampire}]\!]^{s}_{B}$

'Every' is ↓L

↓L

No vampire [yawns]^{B}

↓

No vampire [yawns noisily]^{A}

$[\![\text{yawns noisily}]\!]^{s}_{A} \subseteq [\![\text{yawns}]\!]^{s}_{B}$

↓R

Few vampires [yawn]^{B}

↓

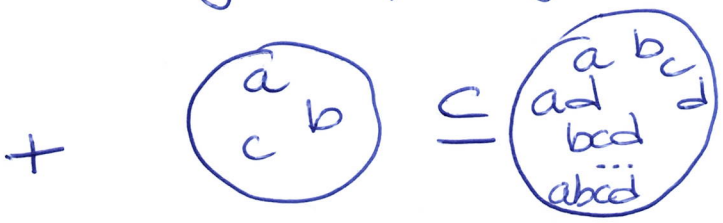
Few vampires [yawn noisily]^{A}

TRANSITIVITY

Every

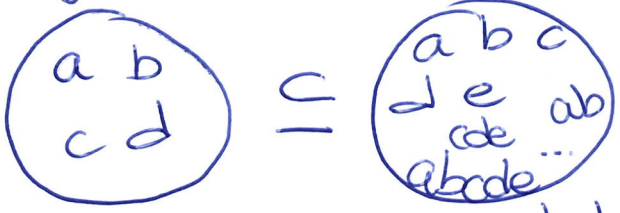
A B

Every vampire yawns

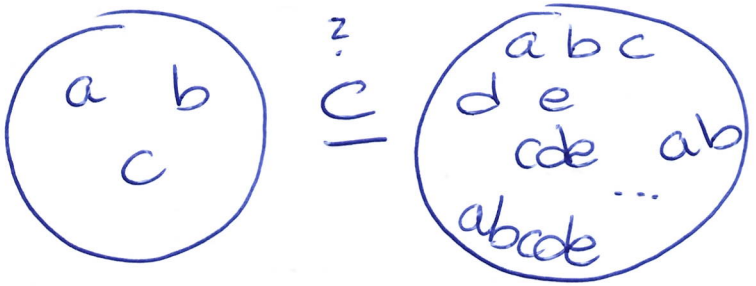


B C

Every yawner is red-haired



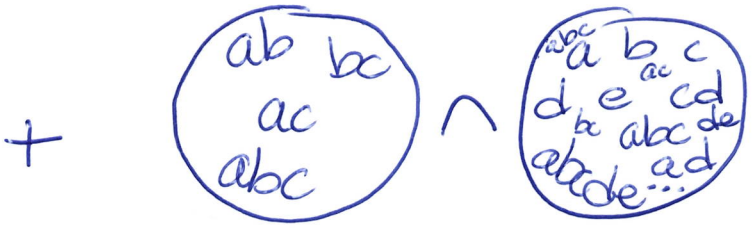
? ↓ Every vampire is red-haired



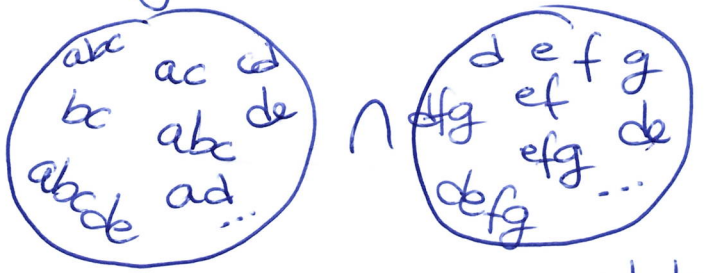
✓

Some

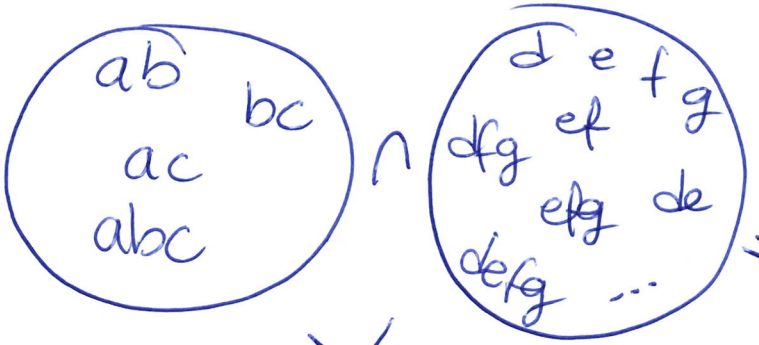
Some vampires yawn



Some yawners are red-haired



? ↓ Some vampires are red-haired



✗