Logik TUT 4

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4.1 Wandern 2.0

4.1.1

a) nein
b) nein
c) ja
d) nein
e) nein

4.1.2

A)
$\Box(C \wedge \Diamond B)$
B)
$\Diamond(C \wedge \Box A)$
C)
$\neg\Diamond A \rightarrow \Box(B \vee C)$
D)
$\Box\Box B$

4.1.3

A)
1
B)
nicht existent

4.2 Aequivalenz oder nicht

4.2.1

$\varphi_1 = \neg\Box A \vee \neg\Box\neg B$
$\equiv \Diamond\neg A \vee \Diamond\neg\neg B$
$\equiv \Diamond(A \to B) = \psi_1$

4.2.2

$\varphi_2 = \Box(A \to B)$
$\equiv \Box(\neg A \vee B)$
$\equiv \Box\neg A \vee \Box B$
$\not\equiv \neg(\Box A) \vee \Box B$
$\equiv \Box A \to \Box B = \psi_2$

4.2.3

$\varphi_3 = \Diamond(A \to (\Box B \to \Diamond C))$
$\equiv \Diamond(A \to (\neg\Box B \vee \Diamond C))$
$\equiv \Diamond(A \to (\Diamond\neg B \vee \Diamond C))$
$\equiv \Diamond(A \to \Diamond(\neg B \vee C))$
$\equiv \Diamond\neg A \vee \Diamond\Diamond(\neg B \vee C)$
$\equiv \neg\Box A \vee \Diamond\Diamond(\neg B \vee C)$
$\equiv \Box A \to \Diamond\Diamond(\neg B \vee C) = \psi_3$

4.2.4

$\varphi_4 = \Box(A \to (\Diamond B \to \Box C))$
$\equiv \Box(A \to (\neg\Diamond B \vee \Box C))$
$\equiv \Box(\neg A \vee (\Box\neg B \vee \Box C))$
$\equiv \Box(\neg A \vee \Box(\neg B \vee C))$
$\equiv \Box\neg A \vee \Box\Box(\neg B \vee C)$
$\equiv \neg\Diamond A \vee \Box\Box(\neg B \vee C)$
$\equiv \Diamond A \to \Box\Box(\neg B \vee C)$
$\not\equiv \Box A \to \Box\Box(\neg B \vee C) = \psi_4$