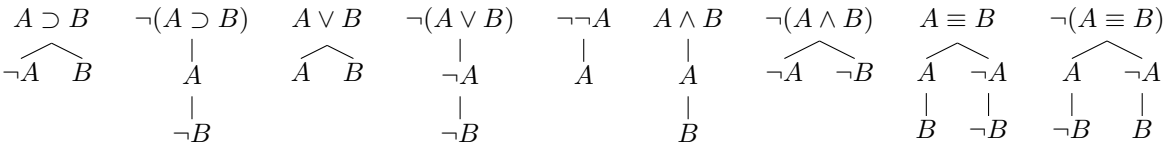
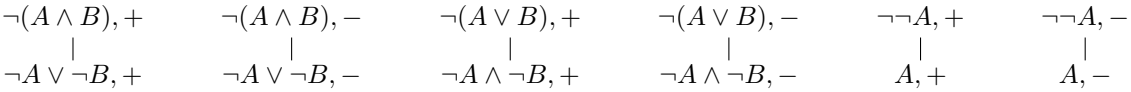
1 Tableaux for classical propositional logic

Initial list for $A_1, ...A_n \models B$ is with $\neg B$. Closure condition: A and $\neg A$ for some formula A occur on a branch.



2 Semantic tableaux for FDE

Initial list for $A_1, ...A_n \models B$ is with all $A_n, +$ and $B, -$. Closure condition: $A, +$ and $A, -$ for some formula A occur on a branch.



3 Semantic tableaux for K_3, LP, L_3, RM_3

3.1 K_3

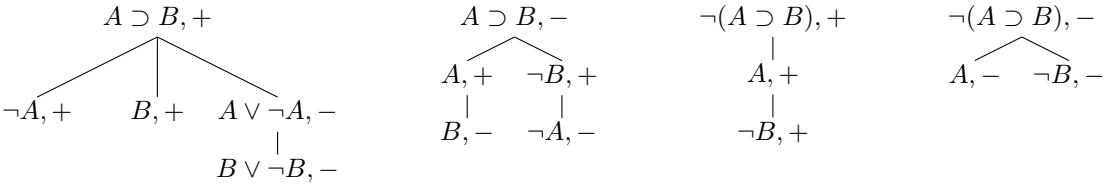
Same as for FDE with extra closure condition: A branch also closes if it contains $A, +$ and $\neg A, +$ for some formula A.

3.2 LP

Same as for FDE with extra closure condition: A branch also closes if it contains $A, -$ and $\neg A, -$ for some formula A.

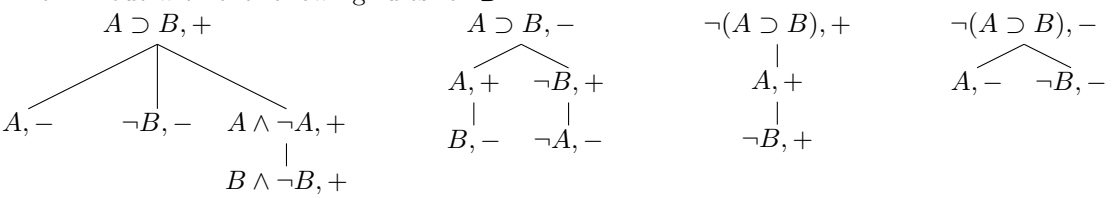
3.3 Ł$_3$

Like K_3 but with the following rules for $\supset$:



3.4 RM_3

Like LP but with the following rules for $\supset$:



4 Tableaux for modal logic

Initial list for $A_1, ...A_n \models B$ is with all $A_n, 0$ and $\neg B, 0$. Closure condition: A, i and $\neg A, i$ for some formula A occur on a branch with the same number i.

$A \supset B, i$: $\neg A, i$ | B, i

$\neg(A \supset B), i$: A, i / $\neg B, i$

$A \vee B, i$: A, i | B, i

$\neg(A \vee B), i$: $\neg A, i$ / $\neg B, i$

$\neg\neg A, i$: A, i

$A \wedge B, i$: A, i / B, i

$\neg(A \wedge B), i$: $\neg A, i$ | $\neg B, i$

$A \equiv B, i$: A, i / B, i | $\neg A, i$ / $\neg B, i$

$\neg(A \equiv B), i$: A, i / $\neg B, i$ | $\neg A, i$ / B, i

$\neg\Box A, i$: $\Diamond\neg A, i$

$\neg\Diamond A, i$: $\Box\neg A, i$

$\Box A, i$: irj / A, j (old j)

$\Diamond A, i$: irj / A, j (new j)

$\neg\Box A, i$: irj / $\neg A, j$ (new j)

$\neg\Diamond A, i$: irj / $\neg A, j$ (old j)

4.1 Restrictions

Reflexive (ρ):

iri

Symmetric (σ)(old j):

irj / jri

Extendable (η)(new j):

irj

Transitive (τ)(old j and k):

irj, jrk / irk

Universal (υ):

$\Diamond A, i$ / A, j

$\Box A, i$ / A, j

Dense (δ)(old j):

irj / irk, krj

Extra rules for $=$:

$\alpha(i)$ / $i = j$ / $\alpha(j)$

$\alpha(i)$ / $j = i$ / $\alpha(j)$

Forward convergent (φ):
(old j and k)

irj, irk / jrk | $j = k$ | krj

Backward convergent (β):
(old j and k)

jri, kri / jrk | $j = k$ | krj

4.2 Tense logic

$[F]A, i$: irj / A, j (old j)

$\langle F\rangle A, i$: irj / A, j (new j)

$\neg[F]A, i$: $\langle F\rangle\neg A, i$

$\neg\langle F\rangle A, i$: $[F]\neg A, i$

$[P]A, i$: jri / A, j (old j)

$\langle P\rangle A, i$: jri / A, j (new j)

$\neg[P]A, i$: $\langle P\rangle\neg A, i$

$\neg\langle P\rangle A, i$: $[P]\neg A, i$

5 First-order modal logic

5.1 CK

$\neg\exists x A, i$: $\forall x\neg A, i$

$\neg\forall x A, i$: $\exists x\neg A, i$

$\forall x A, i$: $A_x(a), i$
where a is old (if possible); otherwise introduce an a

$\exists x A, i$: $A_x(c), i$
where c is new

5.2 VK

$\forall x A, i$: $\neg\mathfrak{E}a, i$ | $A_x(a), i$

$\exists x A, i$: $\mathfrak{E}c, i$ / $A_x(c), i$

a is old, if possible; otherwise introduce a new a, c is a new variable[1]

[1] Made by Nick Ubels, `https://github.com/nickubels/TableauOverview`