

$$d) \{x \wedge y \rightarrow z, y \rightarrow z\} \models x \vee y \rightarrow z$$

TRUTH TABLE

x	y	z	$x \wedge y$	$x \wedge y \rightarrow z$	$y \rightarrow z$	$x \vee y$	$x \vee y \rightarrow z$
0	0	0	0	1	1	0	1
0	0	1	0	1	1	0	1
0	1	0	0	1	0	1	0
0	1	1	0	1	1	1	1
1	0	0	0	1	1	1	0
1	0	1	0	1	1	1	1
1	1	0	1	0	0	1	1
1	1	1	1	1	1	1	1

VALUATION v_5 SATISFIES F BUT NOT $\varphi \Rightarrow F$ $\not\models \varphi$

VALUATIONS

$$X \wedge Y \rightarrow Z, Y \rightarrow Z, \neg(\underline{X \vee Y \rightarrow Z})$$

| α -EXPANSION

$$X \wedge \neg Y \rightarrow Z, Y \rightarrow Z, \underline{X \vee Y}, \neg Z$$

β -FORMULA

$$X \wedge Y \rightarrow Z, \neg Y, X \vee Y, \neg Z$$

UNSATISFIABLE

$$X \wedge Y \rightarrow Z, \underline{Z}, X \vee Y, \neg Z$$

UNSATISFIABLE

$$\underline{X \wedge Y \rightarrow Z}, \neg Y, X, \neg Z$$

$$X \wedge Y \rightarrow Z, \neg Y, Y, \neg Z$$

β -FORMULA

UNSATISFIABLE

$$\neg(\underline{X \wedge Y}), \neg Y, X, \neg Z$$

$$\underline{Z}, \neg Y, X, \neg Z$$

$$\neg X, \neg Y, X, \neg Z$$

UNSATISFIABLE

$$\neg Y, X, \neg Z \Rightarrow V(X)=1, V(Y)=V(Z)=0$$

$\rightarrow V_5$ SATISFIES $F \cup \{\neg \psi\} \Rightarrow F \not\models \psi$

USE RESOLUTION TO CHECK CONSISTENCY OF THE SET

$$\{W \vee \neg X, W \rightarrow Y \wedge Z, \neg Y \rightarrow X, Y \rightarrow W \wedge \neg Z\}$$

INCONSISTENCY = CLOSED EXPANSION

STEP	FORMULA	RULE
1	$\{W \vee \neg X\}$	ASSUMPTION
2	$\{W \rightarrow Y \wedge Z\}$	ASSUMPTION
3	$\{\neg Y \rightarrow X\}$	ASSUMPTION
4	$\{Y \rightarrow W \wedge \neg Z\}$	ASSUMPTION
5	$\{W, \neg X\}$	1, β -EXPANSION
6	$\{\neg W, Y \wedge Z\}$	2, β -EXPANSION
7	$\{\neg W, Y\}$	6, α -EXPANSION
8	$\{\neg W, Z\}$	6, α -EXPANSION
9	$\{\neg \neg Y, X\}$	3, β -EXPANSION
10	$\{X, Y\}$	9, DOUBLE EXPANSION
11	$\{\neg X, W \wedge \neg Z\}$	4, β -EXPANSION
12	$\{W, \neg Y\}$	11, α -EXPANSION
13	$\{\neg Y, \neg Z\}$	11, α -EXPANSION

NOW WE DO NOT KNOW WHAT RESOLUTION TO USE. LET'S MAKE TRIES