

RESOLUTION

$$\{ (x \leftrightarrow y) \rightarrow z, (x \leftrightarrow z) \rightarrow y, \neg(x \rightarrow (y \leftrightarrow z)) \}$$

STEP	FORMULA	RULE
1	$\{ (x \leftrightarrow y) \rightarrow z \}$	ASSUMPTION
2	$\{ (x \leftrightarrow z) \rightarrow y \}$	ASSUMPTION
3	$\{ \neg(x \rightarrow (y \leftrightarrow z)) \}$	ASSUMPTION
4	$\{ (x \rightarrow y) \rightarrow z \}$	1, BIIMPLICATION
5	$\{ (y \rightarrow x) \rightarrow z \}$	1, BIIMPLICATION
6	$\{ \neg(x \rightarrow y), z \}$	4, β -EXPANSION
7	$\{ x, z \}$	6, α -EXPANSION
8	$\{ \neg y, z \}$	6, α -EXPANSION
9	$\{ \neg(y \rightarrow x), z \}$	5, β -EXPANSION
10	$\{ y, z \}$	9, α -EXPANSION
11	$\{ \neg x, z \}$	9, α -EXPANSION
12	$\{ (x \rightarrow z) \rightarrow y \}$	2, BIIMPLICATION
13	$\{ (z \rightarrow x) \rightarrow y \}$	2, BIIMPLICATION
14	$\{ \neg(x \rightarrow z), y \}$	12, β -EXPANSION
15	$\{ x, y \}$	14, α -EXPANSION

16	$\{\neg z, y\}$	14, α -EXPANSION
17	$\{\neg(z \rightarrow x) \rightarrow y\}$	13, β -EXPANSION
18	$\{\neg z, y\}$	17, α -EXPANSION
19	$\{\neg x, y\}$	18, α -EXPANSION
20	$\{x\}$	3, α -EXPANSION
21	$\{\neg(y \leftrightarrow z)\}$	3, α -EXPANSION
22	$\{\neg(y \rightarrow z)\}$	21, BIIMPLICATION
23	$\{\neg(z \rightarrow y)\}$	21, BIIMPLICATION
24	$\{y\}$	22, α -EXPANSION
25	$\{\neg z\}$	22, α -EXPANSION
26	$\{\neg z\}$	23, α -EXPANSION
27	$\{\neg y\}$	23, α -EXPANSION
28	$\{y\}$	16, 26 RESOLUTION
29	\perp	27, 28 RESOLUTION

THE SET HAS A DUAL CLAUSE \Rightarrow THE STATEMENT IS CORRECT $\Rightarrow F \vdash \varphi$

d) $\neg x \vee y, y \rightarrow z \models (\neg y \rightarrow x) \rightarrow \neg z$

SEMANTICAL

x	y	z	$\neg x$	F_1	F_2	$\neg y$	$\neg y \rightarrow x$	$\neg z$	φ
0	0	0	1	1	1	1	0	1	1
0	0	1	1	1	1	1	0	0	1
0	1	0	1	1	0	0	1	1	1
0	1	1	1	1	1	0	1	0	0
1	0	0	0	0	1	1	1	1	1
1	0	1	0	0	1	1	1	0	0
1	1	0	0	1	0	0	1	1	1
1	1	1	0	1	1	0	1	0	0

v_4 SATISSES THE PREMISES BUT NOT THE CONCLUSION

$\models F \not\models \varphi$