

1.	* show	$\neg(\exists y)(\forall x)(P(x,y) \leftrightarrow \neg P(x,x))$	
2.		$(\exists y)(\forall x)(P(x,y) \leftrightarrow \neg P(x,x))$	ASSUME
3.		$(\forall x)(P(x,z_9) \leftrightarrow \neg P(x,x))$	2, EI
4.		$(P(z_9,z_9) \leftrightarrow \neg P(z_9,z_9))$	3, UI
5.		$(P(z_9,z_9) \rightarrow \neg P(z_9,z_9))$	4, BC
6.		$(\neg P(z_9,z_9) \rightarrow P(z_9,z_9))$	4, BC
7.		* show $P(z_9,z_9)$	
8.		$\neg P(z_9,z_9)$	ASSUME
9.		$P(z_9,z_9)$	8,6, MP
10.		$\neg P(z_9,z_9)$	5,7, MP

CPU time: 73 msec

Lines deleted: 0

1.	* show (($\exists y$)($\forall x$)($F(x,y) \leftrightarrow F(x,x)$) $\rightarrow$ $\neg$ ($\forall x$)($\exists y$)($\forall z$)($F(z,y) \leftrightarrow \neg F(z,x)$))	
2.	($\exists y$)($\forall x$)($F(x,y) \leftrightarrow F(x,x)$)	ASSUME
3.	* show $\neg$ ($\forall x$)($\exists y$)($\forall z$)($F(z,y) \leftrightarrow \neg F(z,x)$)	
4.	($\forall x$)($\exists y$)($\forall z$)($F(z,y) \leftrightarrow \neg F(z,x)$)	ASSUME
5.	($\forall x$)($F(x,z_9) \leftrightarrow F(x,x)$)	2, EI
6.	($\exists y$)($\forall z$)($F(z,y) \leftrightarrow \neg F(z,z_9)$)	4, UI
7.	($\forall z$)($F(z,z_8) \leftrightarrow \neg F(z,z_9)$)	6, EI
8.	($F(z_8,z_9) \leftrightarrow F(z_8,z_8)$)	2, EI
9.	($F(z_8,z_8) \leftrightarrow \neg F(z_8,z_9)$) 7, UI	
10.	($F(z_8,z_9) \rightarrow F(z_8,z_8)$)	8, BC
11.	($F(z_8,z_8) \rightarrow F(z_8,z_9)$)	8, BC
12.	($F(z_8,z_8) \rightarrow \neg F(z_8,z_9)$) 9, BC	
13.	($\neg F(z_8,z_9) \rightarrow F(z_8,z_8)$) 9, BC	
14.	* show $F(z_8,z_9)$	
15.	$\neg F(z_8,z_9)$	ASSUME
16.	$F(z_8,z_8)$	13,15, MP
17.	$F(z_8,z_9)$	16,11, MP
18.	$F(z_8,z_8)$	10,14, MP
19.	$\neg F(z_8,z_9)$	12,18, MP

CPU time: 467 msec

Lines deleted: 45

1.	* show	$((\forall z)(\exists y)(\forall x)(F(x,y) \leftrightarrow (F(x,z) \& \neg F(x,x))) \rightarrow \neg(\exists z)(\forall x)F(x,z))$	
2.		$(\forall z)(\exists y)(\forall x)(F(x,y) \leftrightarrow (F(x,z) \& \neg F(x,x)))$	ASSUME
3.	* show	$\neg(\exists z)(\forall x)F(x,z)$	
4.		$(\exists z)(\forall x)F(x,z)$	ASSUME
5.		$(\forall x)F(x,z_9)$	4, EI
6.		$(\exists y)(\forall x)(F(x,y) \leftrightarrow (F(x,z_9) \& \neg F(x,x)))$	2, UI
7.		$F(z_9,z_9)$	5, UI
8.		$(\forall x)(F(x,z_8) \leftrightarrow (F(x,z_9) \& \neg F(x,x)))$	6, EI
9.		$(F(z_9,z_8) \leftrightarrow (F(z_9,z_9) \& \neg F(z_9,z_9)))$	8, UI
10.		$(F(z_9,z_8) \rightarrow (F(z_9,z_9) \& \neg F(z_9,z_9)))$	9, BC
11.		$((F(z_9,z_9) \& \neg F(z_9,z_9)) \rightarrow F(z_9,z_8))$	9, BC
12.	* show	$F(z_9,z_8)$	
13.		$\neg F(z_9,z_8)$	ASSUME
14.		$\neg(F(z_9,z_9) \& \neg F(z_9,z_9))$	13, 11, MT
15.		$F(z_9,z_9)$	7, R
16.	* show	$\neg F(z_9,z_9)$	
17.		$F(z_8,z_9)$	5, UI
18.		$(F(z_8,z_8) \leftrightarrow (F(z_8,z_9) \& \neg F(z_8,z_8)))$	8, UI
19.		$(F(z_8,z_8) \rightarrow (F(z_8,z_9) \& \neg F(z_8,z_8)))$	18, BC
20.		$((F(z_8,z_9) \& \neg F(z_8,z_8)) \rightarrow F(z_8,z_8))$	18, BC
21.	* show	$F(z_8,z_8)$	
22.		$\neg F(z_8,z_8)$	ASSUME
23.		$\neg(F(z_8,z_9) \& \neg F(z_8,z_8))$	22, 20, MT
24.		$(F(z_8,z_9) \& \neg F(z_8,z_8))$	17, 22, ADJ
25.		$(F(z_8,z_9) \& \neg F(z_8,z_8))$	19, 21, MP
26.		$\neg F(z_8,z_8)$	25, S
27.		$(F(z_9,z_9) \& \neg F(z_9,z_9))$	15, 16, ADJ
28.		$(F(z_9,z_9) \& \neg F(z_9,z_9))$	10, 12, MP
29.		$\neg F(z_9,z_9)$	28, S

CPU time: 204 msec

Lines Deleted: 6

1.	* show $\neg(\exists y)(\forall x)(F(x,y) \leftrightarrow \neg(\exists z)(F(x,z) \& F(z,x)))$	
2.	$(\exists y)(\forall x)(F(x,y) \leftrightarrow \neg(\exists z)(F(x,z) \& F(z,x)))$	ASSUME
3.	$(\forall x)(F(x,z_9) \leftrightarrow \neg(\exists z)(F(x,z) \& F(z,x)))$	2, EI
4.	$(F(z_9,z_9) \leftrightarrow \neg(\exists z)(F(z_9,z) \& F(z,z_9)))$	3, UI
5.	$(F(z_9,z_9) \rightarrow \neg(\exists z)(F(z_9,z) \& F(z,z_9)))$	4, BC
6.	$(\neg(\exists z)(F(z_9,z) \& F(z,z_9)) \rightarrow F(z_9,z_9))$	4, BC
7.	* show $F(z_9,z_9)$	
8.	$\neg F(z_9,z_9)$	ASSUME
9.	$\neg\neg(\exists z)(F(z_9,z) \& F(z,z_9))$	6, 8, MT
10.	$(\exists z)(F(z_9,z) \& F(z,z_9))$ 9, DN	
11.	$(F(z_9,z_8) \& F(z_8,z_9))$	10, EI
12.	$F(z_9,z_8)$	11, S
13.	$F(z_8,z_9)$	11, S
14.	* show $\neg(\exists z)(F(z_9,z) \& F(z,z_9))$	
15.	$(F(z_8,z_9) \leftrightarrow \neg(\exists z)(F(z_8,z) \& F(z,z_8)))$	3, UI
16.	$(F(z_8,z_9) \rightarrow \neg(\exists z)(F(z_8,z) \& F(z,z_8)))$	15, BC
17.	$\neg(\exists z)(F(z_8,z) \& F(z,z_8))$	16, 13, MP
18.	$(\forall z)\neg(F(z_8,z) \& F(z,z_8))$	17, QN
19.	$\neg(F(z_8,z_9) \& F(z_9,z_8))$	18, UI
20.	$(F(z_8,z_9) \& F(z_9,z_8))$	13, 12, ADJ
21.	$\neg(\exists z)(F(z_9,z) \& F(z,z_9))$	5, 7, MP
22.	$(\forall z)\neg(F(z_9,z) \& F(z,z_9))$	21, QN
23.	$\neg(F(z_9,z_9) \& F(z_9,z_9))$ 22, UI	
24.	$(F(z_9,z_9) \& F(z_9,z_9))$	7, 7, ADJ

CPU time: 191 msec
Lines Discarded: 2