Proof of Theorem 29b

The theorem to be proved is

$0 = y \quad \vee \quad y - 0 \neq 0 \quad \vee \quad 0 - y \neq 0$

Suppose the theorem does not hold. Then, with the variables held fixed,

(H) $[[\neg\ (0) = (y)] \quad \& \quad [(y - 0) = (0)] \quad \& \quad [(0 - y) = (0)]]$

Special cases of the hypothesis and previous results:

0: $\neg\ 0 = y$ from H:y

1: $y - 0 = 0$ from H:y

2: $y - 0 = y$ from 17;y

Equality substitutions:

3: $\neg\ y - 0 = 0 \quad \vee \quad \neg\ y - 0 = y \quad \vee \quad 0 = y$

Inferences:

4: $\neg\ y - 0 = 0 \quad \vee \quad \neg\ y - 0 = y$ by
0: $\neg\ 0 = y$
3: $\neg\ y - 0 = 0 \quad \vee \quad \neg\ y - 0 = y \quad \vee \quad 0 = y$

5: $\neg\ y - 0 = y$ by
1: $y - 0 = 0$
4: $\neg\ y - 0 = 0 \quad \vee \quad \neg\ y - 0 = y$

6: QEA by
2: $y - 0 = y$
5: $\neg\ y - 0 = y$