Proof of Theorem 289

The theorem to be proved is

$a \oplus c$ ends with c

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

(H) $[[\neg\ (a \oplus c)$ ends with $(c)]]$

Special cases of the hypothesis and previous results:

0: $\neg\ a \oplus c$ ends with c from H:a:c

1: $a \preceq a \oplus c$ from 277;a;c

2: $a \oplus c$ ends with $c \quad \vee \quad \neg\ a \preceq a \oplus c \quad \vee \quad \neg\ a \oplus c = a \oplus c$ from $288^{\Leftarrow}$;$a \oplus c$;c;a

3: $a \oplus c = a \oplus c$ from 5;$a \oplus c$

Inferences:

4: $\neg\ a \preceq a \oplus c \quad \vee \quad \neg\ a \oplus c = a \oplus c$ by

0: $\neg\ a \oplus c$ ends with c

2: $a \oplus c$ ends with $c \quad \vee \quad \neg\ a \preceq a \oplus c \quad \vee \quad \neg\ a \oplus c = a \oplus c$

5: $\neg\ a \oplus c = a \oplus c$ by

1: $a \preceq a \oplus c$

4: $\neg\ a \preceq a \oplus c \quad \vee \quad \neg\ a \oplus c = a \oplus c$

6: QEA by

3: $a \oplus c = a \oplus c$

5: $\neg\ a \oplus c = a \oplus c$