(1) $\emptyset \vdash (A \vee A) \equiv (A \vee A)$

$$\boxed{(A \vee A) \equiv (A \vee A), 0 \ominus}$$
$$0 \mathcal{R} 0$$
$$\boxed{\neg((A \vee A) \equiv (A \vee A)), 0 \oplus}$$

$\neg(A \vee A), 0 \ominus \qquad \boxed{A \vee A, 0 \ominus}$

$\boxed{A \vee A, 0 \ominus} \qquad \neg(A \vee A), 0 \ominus$

$\neg(A \vee A), 0 \oplus \qquad \neg(A \vee A), 0 \oplus$

$\otimes \qquad\qquad \otimes$