





Assume the following.

$$\begin{aligned} & \forall A\_27a.nonempty\ A\_27a \Rightarrow (\forall V0s \in (2^{A\_27a}). (\forall V1t \in \\ & (2^{A\_27a}). (\forall V2x \in A\_27a. ((p\ (ap\ (ap\ (c\_2Ebool\_2EIN\ A\_27a) \\ & V2x)\ (ap\ (ap\ (c\_2Epred\_set\_2EUNION\ A\_27a)\ V0s)\ V1t))) \Leftrightarrow ((p\ (ap\ (ap\ (c\_2Ebool\_2EIN\ A\_27a)\ V2x)\ V0s)) \vee (p\ (ap\ (ap\ (c\_2Ebool\_2EIN\ A\_27a)\ V2x)\ V1t)))))) \end{aligned} \quad (9)$$

Assume the following.

$$(\forall V0t \in 2. ((\neg(\neg(p\ V0t))) \Leftrightarrow (p\ V0t))) \quad (10)$$

Assume the following.

$$(\forall V0A \in 2. ((p\ V0A) \Rightarrow ((\neg(p\ V0A)) \Rightarrow False))) \quad (11)$$

Assume the following.

$$(\forall V0A \in 2. (\forall V1B \in 2. (((\neg((p\ V0A) \vee (p\ V1B))) \Rightarrow False) \Leftrightarrow ((p\ V0A) \Rightarrow False) \Rightarrow ((\neg(p\ V1B)) \Rightarrow False)))) \quad (12)$$

Assume the following.

$$(\forall V0A \in 2. (\forall V1B \in 2. (((\neg((\neg(p\ V0A)) \vee (p\ V1B))) \Rightarrow False) \Leftrightarrow ((p\ V0A) \Rightarrow ((\neg(p\ V1B)) \Rightarrow False)))) \quad (13)$$

Assume the following.

$$(\forall V0A \in 2. (((\neg(p\ V0A)) \Rightarrow False) \Rightarrow (((p\ V0A) \Rightarrow False) \Rightarrow False))) \quad (14)$$

Assume the following.

$$\begin{aligned} & (\forall V0p \in 2. (\forall V1q \in 2. (\forall V2r \in 2. (((p\ V0p) \Leftrightarrow ( \\ & (p\ V1q) \Leftrightarrow (p\ V2r))) \Leftrightarrow (((p\ V0p) \vee ((p\ V1q) \vee (p\ V2r))) \wedge (((p\ V0p) \vee ((\neg \\ & p\ V2r)) \vee (\neg(p\ V1q)))) \wedge (((p\ V1q) \vee ((\neg(p\ V2r)) \vee (\neg(p\ V0p)))) \wedge ((p\ V2r) \vee \\ & ((\neg(p\ V1q)) \vee (\neg(p\ V0p)))))))))) \end{aligned} \quad (15)$$

Assume the following.

$$\begin{aligned} & (\forall V0p \in 2. (\forall V1q \in 2. (\forall V2r \in 2. (((p\ V0p) \Leftrightarrow ( \\ & (p\ V1q) \wedge (p\ V2r))) \Leftrightarrow (((p\ V0p) \vee ((\neg(p\ V1q)) \vee (\neg(p\ V2r)))) \wedge (((p\ V1q) \vee \\ & (\neg(p\ V0p))) \wedge ((p\ V2r) \vee (\neg(p\ V0p)))))))) \end{aligned} \quad (16)$$

Assume the following.

$$\begin{aligned} & (\forall V0p \in 2. (\forall V1q \in 2. (\forall V2r \in 2. (((p\ V0p) \Leftrightarrow ( \\ & (p\ V1q) \vee (p\ V2r))) \Leftrightarrow (((p\ V0p) \vee (\neg(p\ V1q))) \wedge (((p\ V0p) \vee (\neg(p\ V2r))) \wedge \\ & ((p\ V1q) \vee ((p\ V2r) \vee (\neg(p\ V0p)))))))))) \end{aligned} \quad (17)$$

Assume the following.

$$(\forall V0p \in 2. (\forall V1q \in 2. (((p V0p) \Leftrightarrow (\neg(p V1q))) \Leftrightarrow (((p V0p) \vee (p V1q)) \wedge ((\neg(p V1q)) \vee (\neg(p V0p))))))) \quad (18)$$

Assume the following.

$$\begin{aligned} & (\forall V0p \in 2. (\forall V1q \in 2. (\forall V2r \in 2. (\forall V3s \in \\ & 2. (((p V0p) \Leftrightarrow (p (ap (ap (ap (c\_2Ebool\_2ECOND 2) V1q) V2r) V3s))) \Leftrightarrow \\ & (((p V0p) \vee ((p V1q) \vee (\neg(p V3s)))) \wedge (((p V0p) \vee ((\neg(p V2r)) \vee (\neg(p V1q)))) \wedge \\ & (((p V0p) \vee ((\neg(p V2r)) \vee (\neg(p V3s)))) \wedge (((\neg(p V1q)) \vee ((p V2r) \vee (\neg(p V0p)))) \wedge ((p V1q) \vee ((p V3s) \vee (\neg(p V0p))))))))))))) \quad (19) \end{aligned}$$

Assume the following.

$$\begin{aligned} & \forall A\_27a. nonempty A\_27a \Rightarrow (\forall V0R \in ((2^{A\_27a})^{A\_27a}). \\ & (\forall V1s \in (2^{A\_27a}). (\forall V2q \in A\_27a. (\forall V3x \in A\_27a. \\ & (\forall V4y \in A\_27a. ((p (ap (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) \\ & (ap (ap (c\_2Epred\_set\_2EINSERT A\_27a) V2q) V1s) V3x) V4y))) \Leftrightarrow ( \\ & (p (ap (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) V1s) V3x) V4y))) \vee ( \\ & p (ap (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) V1s) V3x) V2q)) \wedge (p ( \\ & ap (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) V1s) V2q) V4y)))))))))) \quad (20) \end{aligned}$$

**Theorem 1**

$$\begin{aligned} & \forall A\_27a. nonempty A\_27a \Rightarrow (\forall V0R \in ((2^{A\_27a})^{A\_27a}). \\ & (\forall V1s \in (2^{A\_27a}). (\forall V2x \in A\_27a. (\forall V3a \in A\_27a. \\ & ((ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) (ap (ap (c\_2Epred\_set\_2EINSERT \\ & A\_27a) V2x) V1s) V3a) = (ap (ap (ap (c\_2Ebool\_2ECOND (2^{A\_27a}) \\ & (ap (ap (c\_2Ebool\_2EIN A\_27a) V2x) (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) \\ & V0R) V1s) V3a))) (ap (ap (c\_2Epred\_set\_2EUNION A\_27a) (ap (ap ( \\ & ap (c\_2Etc\_2EsubTC A\_27a) V0R) V1s) V3a)) (ap (ap (ap (c\_2Etc\_2EsubTC \\ & A\_27a) V0R) V1s) V2x))) (ap (ap (ap (c\_2Etc\_2EsubTC A\_27a) V0R) V1s) \\ & V3a))))))))) \end{aligned}$$