1 Active Clauses

(C9) $\vdash m_0+(((k*(l_0+(\mathbf{1}+\mathbf{1})))+(l_0*(m_0+\mathbf{1})))+\mathbf{1}) = k+((k+(m_0+\mathbf{1}))*(l_0+\mathbf{1}))$

(C51) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_0 + \mathbf{1})) * (t_1 + \mathbf{1}))$
(subsumes 1 clause)

(C53) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_1 + \mathbf{1})) * (t_0 + \mathbf{1}))$
(subsumes 1 clause)

(C54) $\vdash (((t_0 + \mathbf{1}) * t_1) + t_0) + \mathbf{1} = (t_0 + \mathbf{1}) * (t_1 + \mathbf{1})$ (subsumes 1 clause)

(C70) $\mathbf{0} < \mathbf{p_0} \vdash \mathbf{p_0} = s_7(\mathbf{p_0}) + \mathbf{1}$

(C71) $\mathbf{0} < \mathbf{p_0} \vdash t_0 = s_5(\mathbf{p_0}, t_0) + (s_6(\mathbf{p_0}, t_0) * \mathbf{p_0})$

(C72) $\mathbf{0} < \mathbf{p_0}, s_5(\mathbf{p_0}, t_0) = \mathbf{0} \vdash t_0 = \mathbf{0} + (s_6(\mathbf{p_0}, t_0) * \mathbf{p_0})$

(C73) $\mathbf{0} < \mathbf{p_0} \vdash s_5(\mathbf{p_0}, t_0) < \mathbf{p_0}$

(C87) $\mathbf{0} < \mathbf{p_1} \vdash \mathbf{p_1} = s_7(\mathbf{p_1}) + \mathbf{1}$

(C88) $\mathbf{0} < \mathbf{p_1} \vdash t_0 = s_5(\mathbf{p_1}, t_0) + (s_6(\mathbf{p_1}, t_0) * \mathbf{p_1})$

(C89) $\mathbf{0} < \mathbf{p_1}, s_5(\mathbf{p_1}, t_0) = \mathbf{0} \vdash t_0 = \mathbf{0} + (s_6(\mathbf{p_1}, t_0) * \mathbf{p_1})$

(C90) $\mathbf{0} < \mathbf{p_1} \vdash s_5(\mathbf{p_1}, t_0) < \mathbf{p_1}$

(C104) $\mathbf{0} < \mathbf{p_2} \vdash \mathbf{p_2} = s_7(\mathbf{p_2}) + \mathbf{1}$

(C105) $\mathbf{0} < \mathbf{p_2} \vdash t_0 = s_5(\mathbf{p_2}, t_0) + (s_6(\mathbf{p_2}, t_0) * \mathbf{p_2})$

(C106) $\mathbf{0} < \mathbf{p_2}, s_5(\mathbf{p_2}, t_0) = \mathbf{0} \vdash t_0 = \mathbf{0} + (s_6(\mathbf{p_2}, t_0) * \mathbf{p_2})$

(C107) $\mathbf{0} < \mathbf{p_2} \vdash s_5(\mathbf{p_2}, t_0) < \mathbf{p_2}$

(C121) $\mathbf{0} < \mathbf{p_3} \vdash \mathbf{p_3} = s_7(\mathbf{p_3}) + \mathbf{1}$

(C122) $\mathbf{0} < \mathbf{p_3} \vdash t_0 = s_5(\mathbf{p_3}, t_0) + (s_6(\mathbf{p_3}, t_0) * \mathbf{p_3})$

(C123) $\mathbf{0} < \mathbf{p_3}, s_5(\mathbf{p_3}, t_0) = \mathbf{0} \vdash t_0 = \mathbf{0} + (s_6(\mathbf{p_3}, t_0) * \mathbf{p_3})$

(C124) $\mathbf{0} < \mathbf{p_3} \vdash s_5(\mathbf{p_3}, t_0) < \mathbf{p_3}$

(C170) $t_0 = \mathbf{p_3}, nat_{26} * nat_{27} = t_0 \vdash nat_{26} = \mathbf{1}, nat_{26} = t_0$

(C171) $t_0 = \mathbf{p_3} \vdash \mathbf{1} < t_0$

(C172) $t_0 = \mathbf{p_2}, nat_{26} * nat_{27} = t_0 \vdash nat_{26} = \mathbf{1}, nat_{26} = t_0$

(C173) $t_0 = \mathbf{p_2} \vdash \mathbf{1} < t_0$

(C174) $t_0 = \mathbf{p_1}, nat_{26} * nat_{27} = t_0 \vdash nat_{26} = \mathbf{1}, nat_{26} = t_0$

(C175) $t_0 = \mathbf{p_1} \vdash \mathbf{1} < t_0$

(C176) $t_0 = \mathbf{p_0}, nat_{26} * nat_{27} = t_0 \vdash nat_{26} = \mathbf{1}, nat_{26} = t_0$

(C177) $t_0 = \mathbf{p_0} \vdash \mathbf{1} < t_0$

(C187) $\vdash m_0 = \mathbf{1}, s_1(m_0) * s_4(m_0) = m_0$

(C190) $\vdash m_0 = \mathbf{1}, s_1(m_0) = \mathbf{p_0}, s_1(m_0) = \mathbf{p_1}, s_1(m_0) = \mathbf{p_2}, s_1(m_0) = \mathbf{p_3}$

(C193) $t_0 = \mathbf{p_3}, \mathbf{1} = n_0 * t_0 \vdash$

(C196) $t_0 = \mathbf{p_2}, \mathbf{1} = n_0 * t_0 \vdash$

(C199) $t_0 = \mathbf{p_1}, \mathbf{1} = n_0 * t_0 \vdash$

(C202) $t_0 = \mathbf{p_0}, \mathbf{1} = n_0 * t_0 \vdash$

2 Subsumed

(C1) $\mathbf{1} + (l_0 + \mathbf{1}) = \mathbf{1} \vdash$ by (A14)

(C17) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_0 + \mathbf{1})) * (t_1 + \mathbf{1}))$ by (C36)

(C21) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_1 + \mathbf{1})) * (t_0 + \mathbf{1}))$ by (C39)

(C22) $\vdash (((t_0 + \mathbf{1}) * t_1) + t_0) + \mathbf{1} = (t_0 + \mathbf{1}) * (t_1 + \mathbf{1})$ by (C40)

(C36) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_0 + \mathbf{1})) * (t_1 + \mathbf{1}))$ by (C51)

(C39) $m_0 = k_0 + (r_0 * ((t_0 + \mathbf{1}) * (t_1 + \mathbf{1}))) \vdash m_0 = k_0 + ((r_0 * (t_1 + \mathbf{1})) * (t_0 + \mathbf{1}))$ by (C53)

(C40) $\vdash (((t_0 + \mathbf{1}) * t_1) + t_0) + \mathbf{1} = (t_0 + \mathbf{1}) * (t_1 + \mathbf{1})$ by (C54)

(C65) $\mathbf{0} < \mathbf{p_0} \vdash (q_0 * \mathbf{p_0}) + (r_0 * \mathbf{p_0}) = (q_0 + r_0) * \mathbf{p_0}$ by (A24)

(C66) $\mathbf{0} < \mathbf{p_0} \vdash (i_0 + (q_0 * \mathbf{p_0})) + (r_0 * \mathbf{p_0}) = i_0 + ((q_0 * \mathbf{p_0}) + (r_0 * \mathbf{p_0}))$ by (A4)

(C74) $\mathbf{0} < i_0, \mathbf{0} < \mathbf{p_0}, i_0 < \mathbf{p_0}, i_0 + (q_0 * \mathbf{p_0}) = \mathbf{0} + (r_0 * \mathbf{p_0}) \vdash$ by (A30)

(C75) $i_0 < \mathbf{0}, \mathbf{0} < \mathbf{p_0}, i_0 < \mathbf{p_0}, i_0 + (q_0 * \mathbf{p_0}) = \mathbf{0} + (r_0 * \mathbf{p_0}) \vdash$ by (A29)

(C76) $\vdash i_0 = \mathbf{0}, i_0 < \mathbf{0}, \mathbf{0} < i_0$ by (A32)

(C78) $\mathbf{0} + \mathbf{1} < \mathbf{p_0} \vdash \mathbf{0} < \mathbf{p_0}$ by (A1)

(C79) $\vdash \mathbf{0} + \mathbf{1} = \mathbf{1}$ by (A7)

(C82) $\mathbf{0} < \mathbf{p_1} \vdash (q_0 * \mathbf{p_1}) + (r_0 * \mathbf{p_1}) = (q_0 + r_0) * \mathbf{p_1}$ by (A24)

(C83) $\mathbf{0} < \mathbf{p_1} \vdash (i_0 + (q_0 * \mathbf{p_1})) + (r_0 * \mathbf{p_1}) = i_0 + ((q_0 * \mathbf{p_1}) + (r_0 * \mathbf{p_1}))$ by (A4)

(C91) $\mathbf{0} < i_0, \mathbf{0} < \mathbf{p_1}, i_0 < \mathbf{p_1}, i_0 + (q_0 * \mathbf{p_1}) = \mathbf{0} + (r_0 * \mathbf{p_1}) \vdash$ by (A30)

(C92) $i_0 < \mathbf{0}, \mathbf{0} < \mathbf{p_1}, i_0 < \mathbf{p_1}, i_0 + (q_0 * \mathbf{p_1}) = \mathbf{0} + (r_0 * \mathbf{p_1}) \vdash$ by (A29)

(C93) $\vdash i_0 = \mathbf{0}, i_0 < \mathbf{0}, \mathbf{0} < i_0$ by (A32)

(C95) $\mathbf{0} + \mathbf{1} < \mathbf{p_1} \vdash \mathbf{0} < \mathbf{p_1}$ by (A1)

(C96) $\vdash \mathbf{0}+\mathbf{1}=\mathbf{1}$ by (A7)

(C99) $\mathbf{0}<\mathbf{p_2} \vdash (q_0 * \mathbf{p_2})+(r_0 * \mathbf{p_2})=(q_0+r_0) * \mathbf{p_2}$ by (A24)

(C100) $\mathbf{0}<\mathbf{p_2} \vdash (i_0+(q_0 * \mathbf{p_2}))+(r_0 * \mathbf{p_2})=i_0+((q_0 * \mathbf{p_2})+(r_0 * \mathbf{p_2}))$ by (A4)

(C108) $\mathbf{0}<i_0, \mathbf{0}<\mathbf{p_2}, i_0<\mathbf{p_2}, i_0+(q_0 * \mathbf{p_2})=\mathbf{0}+(r_0 * \mathbf{p_2}) \vdash$ by (A30)

(C109) $i_0<\mathbf{0}, \mathbf{0}<\mathbf{p_2}, i_0<\mathbf{p_2}, i_0+(q_0 * \mathbf{p_2})=\mathbf{0}+(r_0 * \mathbf{p_2}) \vdash$ by (A29)

(C110) $\vdash i_0=\mathbf{0}, i_0<\mathbf{0}, \mathbf{0}<i_0$ by (A32)

(C112) $\mathbf{0}+\mathbf{1}<\mathbf{p_2} \vdash \mathbf{0}<\mathbf{p_2}$ by (A1)

(C113) $\vdash \mathbf{0}+\mathbf{1}=\mathbf{1}$ by (A7)

(C116) $\mathbf{0}<\mathbf{p_3} \vdash (q_0 * \mathbf{p_3})+(r_0 * \mathbf{p_3})=(q_0+r_0) * \mathbf{p_3}$ by (A24)

(C117) $\mathbf{0}<\mathbf{p_3} \vdash (i_0+(q_0 * \mathbf{p_3}))+(r_0 * \mathbf{p_3})=i_0+((q_0 * \mathbf{p_3})+(r_0 * \mathbf{p_3}))$ by (A4)

(C125) $\mathbf{0}<i_0, \mathbf{0}<\mathbf{p_3}, i_0<\mathbf{p_3}, i_0+(q_0 * \mathbf{p_3})=\mathbf{0}+(r_0 * \mathbf{p_3}) \vdash$ by (A30)

(C126) $i_0<\mathbf{0}, \mathbf{0}<\mathbf{p_3}, i_0<\mathbf{p_3}, i_0+(q_0 * \mathbf{p_3})=\mathbf{0}+(r_0 * \mathbf{p_3}) \vdash$ by (A29)

(C127) $\vdash i_0=\mathbf{0}, i_0<\mathbf{0}, \mathbf{0}<i_0$ by (A32)

(C129) $\mathbf{0}+\mathbf{1}<\mathbf{p_3} \vdash \mathbf{0}<\mathbf{p_3}$ by (A1)

(C130) $\vdash \mathbf{0}+\mathbf{1}=\mathbf{1}$ by (A7)

(C188) $\vdash m_0=\mathbf{1}, s_4(m_0) * s_1(m_0)=s_1(m_0) * s_4(m_0)$ by (A15)

(C189) $\vdash m_0=\mathbf{1}, \mathbf{0}+(s_4(m_0) * s_1(m_0))=s_4(m_0) * s_1(m_0)$ by (A7)

(C195) $t_0=\mathbf{p_3} \vdash \mathbf{0}+(n_0 * t_0)=n_0 * t_0$ by (A7)

(C198) $t_0=\mathbf{p_2} \vdash \mathbf{0}+(n_0 * t_0)=n_0 * t_0$ by (A7)

(C201) $t_0=\mathbf{p_1} \vdash \mathbf{0}+(n_0 * t_0)=n_0 * t_0$ by (A7)

(C204) $t_0=\mathbf{p_0} \vdash \mathbf{0}+(n_0 * t_0)=n_0 * t_0$ by (A7)

3 Clauses with Tautologies

(C2) $nat_2+(nat_3+\mathbf{1})=\mathbf{1} \vdash nat_2+(nat_3+\mathbf{1})=\mathbf{1}$

(C3) $nat_4=\mathbf{1} \vdash nat_4=\mathbf{1}$

(C4) $nat_7=\mathbf{1} \vdash nat_7=\mathbf{1}$

(C5) $nat_7=nat_5+(nat_8 * (nat_6+\mathbf{1})) \vdash nat_7=nat_5+(nat_8 * (nat_6+\mathbf{1}))$

(C6) $nat_5=\mathbf{1} \vdash nat_5=\mathbf{1}$

(C7) $m_0+(n_0+\mathbf{1}) \in x \vdash m_0+(n_0+\mathbf{1}) \in x$

(C8) $m_0+(n_0+\mathbf{1})=k+(nat_1 * (l_0+\mathbf{1})) \vdash m_0+(n_0+\mathbf{1})=k+(nat_1 * (l_0+\mathbf{1}))$

(C10) $k \in x \vdash k \in x$

(C11) $nat_{11} = \mathbf{1} \vdash nat_{11} = \mathbf{1}$

(C12) $nat_{11} = nat_9 + (nat_{12} * (nat_{10} + \mathbf{1})) \vdash nat_{11} = nat_9 + (nat_{12} * (nat_{10} + \mathbf{1}))$

(C13) $nat_9 = \mathbf{1} \vdash nat_9 = \mathbf{1}$

(C14) $n_0 = \mathbf{1} \vdash n_0 = \mathbf{1}$

(C15) $n_0 = \mathbf{1} \vdash n_0 = \mathbf{1}$

(C16) $m_0 = \mathbf{0} + (nat_{91} * \mathbf{p_3}) \vdash m_0 = \mathbf{0} + (nat_{91} * \mathbf{p_3})$

(C18) $m_0 = \mathbf{0} + (nat_{90} * \mathbf{p_2}) \vdash m_0 = \mathbf{0} + (nat_{90} * \mathbf{p_2})$

(C19) $m_0 = \mathbf{0} + (nat_{89} * \mathbf{p_1}) \vdash m_0 = \mathbf{0} + (nat_{89} * \mathbf{p_1})$

(C20) $m_0 = \mathbf{0} + (nat_{88} * \mathbf{p_0}) \vdash m_0 = \mathbf{0} + (nat_{88} * \mathbf{p_0})$

(C23) $k_0 = \mathbf{0} + (nat_{87} * \mathbf{p_3}) \vdash k_0 = \mathbf{0} + (nat_{87} * \mathbf{p_3})$

(C24) $k_0 = \mathbf{0} + (nat_{86} * \mathbf{p_2}) \vdash k_0 = \mathbf{0} + (nat_{86} * \mathbf{p_2})$

(C25) $k_0 = \mathbf{0} + (nat_{85} * \mathbf{p_1}) \vdash k_0 = \mathbf{0} + (nat_{85} * \mathbf{p_1})$

(C26) $k_0 = \mathbf{0} + (nat_{84} * \mathbf{p_0}) \vdash k_0 = \mathbf{0} + (nat_{84} * \mathbf{p_0})$

(C27) $n_0 = \mathbf{0} + (nat_{83} * \mathbf{p_3}) \vdash n_0 = \mathbf{0} + (nat_{83} * \mathbf{p_3})$

(C28) $n_0 = \mathbf{0} + (nat_{82} * \mathbf{p_2}) \vdash n_0 = \mathbf{0} + (nat_{82} * \mathbf{p_2})$

(C29) $n_0 = \mathbf{0} + (nat_{81} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{81} * \mathbf{p_1})$

(C30) $n_0 = \mathbf{0} + (nat_{80} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{80} * \mathbf{p_0})$

(C31) $n_0 = \mathbf{0} + (nat_{76} * \mathbf{p_3}) \vdash n_0 = \mathbf{0} + (nat_{76} * \mathbf{p_3})$

(C32) $n_0 = \mathbf{0} + (nat_{79} * \mathbf{p_2}) \vdash n_0 = \mathbf{0} + (nat_{79} * \mathbf{p_2})$

(C33) $n_0 = \mathbf{0} + (nat_{78} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{78} * \mathbf{p_1})$

(C34) $n_0 = \mathbf{0} + (nat_{77} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{77} * \mathbf{p_0})$

(C35) $m_0 = \mathbf{0} + (nat_{75} * \mathbf{p_2}) \vdash m_0 = \mathbf{0} + (nat_{75} * \mathbf{p_2})$

(C37) $m_0 = \mathbf{0} + (nat_{74} * \mathbf{p_1}) \vdash m_0 = \mathbf{0} + (nat_{74} * \mathbf{p_1})$

(C38) $m_0 = \mathbf{0} + (nat_{73} * \mathbf{p_0}) \vdash m_0 = \mathbf{0} + (nat_{73} * \mathbf{p_0})$

(C41) $k_0 = \mathbf{0} + (nat_{72} * \mathbf{p_2}) \vdash k_0 = \mathbf{0} + (nat_{72} * \mathbf{p_2})$

(C42) $k_0 = \mathbf{0} + (nat_{71} * \mathbf{p_1}) \vdash k_0 = \mathbf{0} + (nat_{71} * \mathbf{p_1})$

(C43) $k_0 = \mathbf{0} + (nat_{70} * \mathbf{p_0}) \vdash k_0 = \mathbf{0} + (nat_{70} * \mathbf{p_0})$

(C44) $n_0 = \mathbf{0} + (nat_{67} * \mathbf{p_2}) \vdash n_0 = \mathbf{0} + (nat_{67} * \mathbf{p_2})$

(C45) $n_0 = \mathbf{0} + (nat_{69} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{69} * \mathbf{p_1})$

(C46) $n_0 = \mathbf{0} + (nat_{68} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{68} * \mathbf{p_0})$

(C47) $n_0 = \mathbf{0} + (nat_{64} * \mathbf{p_2}) \vdash n_0 = \mathbf{0} + (nat_{64} * \mathbf{p_2})$

(C48) $n_0 = \mathbf{0} + (nat_{66} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{66} * \mathbf{p_1})$

(C49) $n_0 = \mathbf{0} + (nat_{65} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{65} * \mathbf{p_0})$

(C50) $m_0 = \mathbf{0} + (nat_{63} * \mathbf{p_1}) \vdash m_0 = \mathbf{0} + (nat_{63} * \mathbf{p_1})$

(C52) $m_0 = \mathbf{0} + (nat_{62} * \mathbf{p_0}) \vdash m_0 = \mathbf{0} + (nat_{62} * \mathbf{p_0})$

(C55) $k_0 = \mathbf{0} + (nat_{61} * \mathbf{p_1}) \vdash k_0 = \mathbf{0} + (nat_{61} * \mathbf{p_1})$

(C56) $k_0 = \mathbf{0} + (nat_{60} * \mathbf{p_0}) \vdash k_0 = \mathbf{0} + (nat_{60} * \mathbf{p_0})$

(C57) $n_0 = \mathbf{0} + (nat_{59} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{59} * \mathbf{p_1})$

(C58) $n_0 = \mathbf{0} + (nat_{58} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{58} * \mathbf{p_0})$

(C59) $n_0 = \mathbf{0} + (nat_{56} * \mathbf{p_1}) \vdash n_0 = \mathbf{0} + (nat_{56} * \mathbf{p_1})$

(C60) $n_0 = \mathbf{0} + (nat_{57} * \mathbf{p_0}) \vdash n_0 = \mathbf{0} + (nat_{57} * \mathbf{p_0})$

(C61) $nat_{53} = \mathbf{0} + (nat_{55} * \mathbf{p_0}) \vdash nat_{53} = \mathbf{0} + (nat_{55} * \mathbf{p_0})$

(C62) $nat_{53} = nat_{50} + (nat_{54} * (nat_{52} + \mathbf{1})) \vdash nat_{53} = nat_{50} + (nat_{54} * (nat_{52} + \mathbf{1}))$

(C63) $nat_{50} = \mathbf{0} + (nat_{51} * \mathbf{p_0}) \vdash nat_{50} = \mathbf{0} + (nat_{51} * \mathbf{p_0})$

(C64) $\mathbf{0} < \mathbf{p_0}, t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_0}) \vdash t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_0})$

(C67) $\mathbf{0} < \mathbf{p_0}, m_0 = i_0 + (q_0 * \mathbf{p_0}) \vdash m_0 = i_0 + (q_0 * \mathbf{p_0})$

(C68) $\mathbf{0} < \mathbf{p_0}, i_0 = \mathbf{0} \vdash i_0 = \mathbf{0}$

(C69) $\mathbf{0} < \mathbf{p_0}, i_0 < \mathbf{p_0} \vdash i_0 < \mathbf{p_0}$

(C77) $t_0 = i_0 + (q_0 * \mathbf{p_0}) \vdash t_0 = i_0 + (q_0 * \mathbf{p_0})$

(C80) $\mathbf{1} < \mathbf{p_0} \vdash \mathbf{1} < \mathbf{p_0}$

(C81) $\mathbf{0} < \mathbf{p_1}, t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_1}) \vdash t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_1})$

(C84) $\mathbf{0} < \mathbf{p_1}, m_0 = i_0 + (q_0 * \mathbf{p_1}) \vdash m_0 = i_0 + (q_0 * \mathbf{p_1})$

(C85) $\mathbf{0} < \mathbf{p_1}, i_0 = \mathbf{0} \vdash i_0 = \mathbf{0}$

(C86) $\mathbf{0} < \mathbf{p_1}, i_0 < \mathbf{p_1} \vdash i_0 < \mathbf{p_1}$

(C94) $t_0 = i_0 + (q_0 * \mathbf{p_1}) \vdash t_0 = i_0 + (q_0 * \mathbf{p_1})$

(C97) $\mathbf{1} < \mathbf{p_1} \vdash \mathbf{1} < \mathbf{p_1}$

(C98) $\mathbf{0} < \mathbf{p_2}, t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_2}) \vdash t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_2})$

(C101) $\mathbf{0} < \mathbf{p_2}, m_0 = i_0 + (q_0 * \mathbf{p_2}) \vdash m_0 = i_0 + (q_0 * \mathbf{p_2})$

(C102) $\mathbf{0} < \mathbf{p_2}, i_0 = \mathbf{0} \vdash i_0 = \mathbf{0}$

(C103) $\mathbf{0} < \mathbf{p_2}, i_0 < \mathbf{p_2} \vdash i_0 < \mathbf{p_2}$

(C111) $t_0 = i_0 + (q_0 * \mathbf{p_2}) \vdash t_0 = i_0 + (q_0 * \mathbf{p_2})$

(C114) $\mathbf{1} < \mathbf{p_2} \vdash \mathbf{1} < \mathbf{p_2}$

(C115) $\mathbf{0} < \mathbf{p_3}, t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_3}) \vdash t_0 = i_0 + ((q_0 + r_0) * \mathbf{p_3})$

(C118) $\mathbf{0} < \mathbf{p_3}, m_0 = i_0 + (q_0 * \mathbf{p_3}) \vdash m_0 = i_0 + (q_0 * \mathbf{p_3})$

(C119) $\mathbf{0} < \mathbf{p_3}, i_0 = \mathbf{0} \vdash i_0 = \mathbf{0}$

(C120) $\mathbf{0} < \mathbf{p_3}, i_0 < \mathbf{p_3} \vdash i_0 < \mathbf{p_3}$

(C128) $t_0 = i_0 + (q_0 * \mathbf{p_3}) \vdash t_0 = i_0 + (q_0 * \mathbf{p_3})$

(C131) $\mathbf{1} < \mathbf{p_3} \vdash \mathbf{1} < \mathbf{p_3}$

(C132) $nat_{40} = \mathbf{p_3} \vdash nat_{40} = \mathbf{p_3}$

(C133) $nat_{40} = \mathbf{1} \vdash nat_{40} = \mathbf{1}$

(C134) $nat_{40} * nat_{41} = \mathbf{p_3} \vdash nat_{40} * nat_{41} = \mathbf{p_3}$

(C135) $\mathbf{1} < \mathbf{p_3} \vdash \mathbf{1} < \mathbf{p_3}$

(C137) $nat_{38} = \mathbf{p_2} \vdash nat_{38} = \mathbf{p_2}$

(C138) $nat_{38} = \mathbf{1} \vdash nat_{38} = \mathbf{1}$

(C139) $nat_{38} * nat_{39} = \mathbf{p_2} \vdash nat_{38} * nat_{39} = \mathbf{p_2}$

(C140) $\mathbf{1} < \mathbf{p_2} \vdash \mathbf{1} < \mathbf{p_2}$

(C142) $nat_{36} = \mathbf{p_1} \vdash nat_{36} = \mathbf{p_1}$

(C143) $nat_{36} = \mathbf{1} \vdash nat_{36} = \mathbf{1}$

(C144) $nat_{36} * nat_{37} = \mathbf{p_1} \vdash nat_{36} * nat_{37} = \mathbf{p_1}$

(C145) $\mathbf{1} < \mathbf{p_1} \vdash \mathbf{1} < \mathbf{p_1}$

(C147) $nat_{34} = \mathbf{p_0} \vdash nat_{34} = \mathbf{p_0}$

(C148) $nat_{34} = \mathbf{1} \vdash nat_{34} = \mathbf{1}$

(C149) $nat_{34} * nat_{35} = \mathbf{p_0} \vdash nat_{34} * nat_{35} = \mathbf{p_0}$

(C150) $\mathbf{1} < \mathbf{p_0} \vdash \mathbf{1} < \mathbf{p_0}$

(C152) $nat_{32} = t_0 \vdash nat_{32} = t_0$

(C153) $nat_{32} = \mathbf{1} \vdash nat_{32} = \mathbf{1}$

(C154) $nat_{32} * nat_{33} = t_0 \vdash nat_{32} * nat_{33} = t_0$

(C155) $\mathbf{1} < t_0 \vdash \mathbf{1} < t_0$

(C156) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C157) $nat_{30} = t_0 \vdash nat_{30} = t_0$

(C158) $nat_{30} = \mathbf{1} \vdash nat_{30} = \mathbf{1}$

(C159) $nat_{30} * nat_{31} = t_0 \vdash nat_{30} * nat_{31} = t_0$

(C160) $\mathbf{1} < t_0 \vdash \mathbf{1} < t_0$

(C161) $t_0 = \mathbf{p_1} \vdash t_0 = \mathbf{p_1}$

(C162) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C163) $nat_{28} = t_0 \vdash nat_{28} = t_0$

(C164) $nat_{28} = \mathbf{1} \vdash nat_{28} = \mathbf{1}$

(C165) $nat_{28} * nat_{29} = t_0 \vdash nat_{28} * nat_{29} = t_0$

(C166) $\mathbf{1} < t_0 \vdash \mathbf{1} < t_0$

(C167) $t_0 = \mathbf{p_2} \vdash t_0 = \mathbf{p_2}$

(C168) $t_0 = \mathbf{p_1} \vdash t_0 = \mathbf{p_1}$

(C169) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C178) $m_0 = \mathbf{0} + (nat_{16} * t_0) \vdash m_0 = \mathbf{0} + (nat_{16} * t_0)$

(C179) $t_0 = \mathbf{p_3} \vdash t_0 = \mathbf{p_3}$

(C180) $m_0 = \mathbf{0} + (nat_{15} * t_0) \vdash m_0 = \mathbf{0} + (nat_{15} * t_0)$

(C181) $t_0 = \mathbf{p_2} \vdash t_0 = \mathbf{p_2}$

(C182) $m_0 = \mathbf{0} + (nat_{14} * t_0) \vdash m_0 = \mathbf{0} + (nat_{14} * t_0)$

(C183) $t_0 = \mathbf{p_1} \vdash t_0 = \mathbf{p_1}$

(C184) $m_0 = \mathbf{0} + (nat_{13} * t_0) \vdash m_0 = \mathbf{0} + (nat_{13} * t_0)$

(C185) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C191) $m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C192) $m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C194) $t_0 = \mathbf{p_3}, m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C197) $t_0 = \mathbf{p_2}, m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C200) $t_0 = \mathbf{p_1}, m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C203) $t_0 = \mathbf{p_0}, m_0 = \mathbf{1} \vdash m_0 = \mathbf{1}$

(C205) $m_0 = \mathbf{0} + (nat_{19} * \mathbf{p_3}) \vdash m_0 = \mathbf{0} + (nat_{19} * \mathbf{p_3})$

(C207) $m_0 = \mathbf{0} + (nat_{25} * t_0) \vdash m_0 = \mathbf{0} + (nat_{25} * t_0)$

(C208) $t_0 = \mathbf{p_2} \vdash t_0 = \mathbf{p_2}$

(C209) $t_0 = \mathbf{p_1} \vdash t_0 = \mathbf{p_1}$

(C210) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C211) $m_0 = \mathbf{0} + (nat_{20} * \mathbf{p_2}) \vdash m_0 = \mathbf{0} + (nat_{20} * \mathbf{p_2})$

(C213) $m_0 = \mathbf{0} + (nat_{24} * t_0) \vdash m_0 = \mathbf{0} + (nat_{24} * t_0)$

(C214) $t_0 = \mathbf{p_1} \vdash t_0 = \mathbf{p_1}$

(C215) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C216) $m_0 = \mathbf{0} + (nat_{21} * \mathbf{p_1}) \vdash m_0 = \mathbf{0} + (nat_{21} * \mathbf{p_1})$

(C218) $m_0 = \mathbf{0} + (nat_{23} * t_0) \vdash m_0 = \mathbf{0} + (nat_{23} * t_0)$

(C219) $t_0 = \mathbf{p_0} \vdash t_0 = \mathbf{p_0}$

(C220) $m_0 = \mathbf{0} + (nat_{22} * \mathbf{p_0}) \vdash m_0 = \mathbf{0} + (nat_{22} * \mathbf{p_0})$

4 Clauses with Reflexivity

(C136) $\vdash \mathbf{p_3} = \mathbf{p_3}$

(C141) $\vdash \mathbf{p_2} = \mathbf{p_2}$

(C146) $\vdash \mathbf{p_1} = \mathbf{p_1}$

(C151) $\vdash \mathbf{p_0} = \mathbf{p_0}$

(C186) $\vdash m_0 = \mathbf{1}, m_0 = m_0$

(C206) $\vdash \mathbf{p_3} = \mathbf{p_3}$

(C212) $\vdash \mathbf{p_2} = \mathbf{p_2}$

(C217) $\vdash \mathbf{p_1} = \mathbf{p_1}$

(C221) $\vdash \mathbf{p_0} = \mathbf{p_0}$

(C222) $\vdash \mathbf{1} = \mathbf{1}$

5 Explicit Axioms

(A1) $n + \mathbf{1} < m \vdash n < m$ (subsumes 4 clauses)

(A2) $\vdash k + l = l + k$

(A3) $\vdash k + (l + m) = (k + l) + m$

(A4) $\vdash (k + l) + m = k + (l + m)$ (subsumes 4 clauses)

(A5) $\vdash k + \mathbf{0} = k$

(A6) $k + l = k + m \vdash l = m$

(A7) $\vdash \mathbf{0} + k = k$ (subsumes 9 clauses)

(A8) $k + l = m + l \vdash k = m$

(A9) $k = l + k \vdash l = \mathbf{0}$

(A10) $k = k + l \vdash l = \mathbf{0}$

(A11) $k + l = k \vdash l = \mathbf{0}$

(A12) $k + l = l \vdash k = \mathbf{0}$

(A13) $k = l \vdash m + k = m + l$

(A14) $\mathbf{1} + (k + \mathbf{1}) = \mathbf{1} \vdash$ (subsumes 1 clause)

(A15) $\vdash k * l = l * k$ (subsumes 1 clause)

(A16) $k + \mathbf{1} = \mathbf{0} \vdash$

(A17) $\vdash k * (l * m) = (k * l) * m$

(A18) $\vdash (k * l) * m = k * (l * m)$

(A19) $\vdash k * \mathbf{1} = k$

(A20) $\vdash \mathbf{1} * k = k$

(A21) $\vdash k * (l + m) = (k * l) + (k * m)$

(A22) $\vdash (k * l) + (k * m) = k * (m + l)$

(A23) $\vdash (k + l) * m = (k * m) + (l * m)$

(A24) $\vdash (k * l) + (m * l) = (k + m) * l$ (subsumes 4 clauses)

(A25) $\vdash (k * l) + k = k * (l + \mathbf{1})$

(A26) $\vdash (k + l) * m = (l * m) + (k * m)$

(A27) $\mathbf{1} = k * l \vdash k = \mathbf{1}$

(A28) $\mathbf{1} = l * k \vdash k = \mathbf{1}$

(A29) $k < l, k < m, l < m, k + (i * m) = l + (j * m) \vdash$ (subsumes 4 clauses)

(A30) $k < l, k < m, l < m, l + (i * m) = k + (j * m) \vdash$ (subsumes 4 clauses)

(A31) $\mathbf{1} < k, k = \mathbf{1} \vdash$

(A32) $\vdash k = l, k < l, l < k$ (subsumes 4 clauses)

(A33) $\vdash \mathbf{0} < k + \mathbf{1}$

(A34) $\mathbf{1} < k, \mathbf{1} = l * k \vdash$