9.2.16

Verificati daca urmatoarele formule sunt teoreme utilizand rezolutia generala.

5) $P(a)\wedge(\forall x)(P(x)\rightarrow P(f(x)))\rightarrow(\forall x)P(x)$

Se inlocuiesc conectivele $\rightarrow$

$\vdash P(a)\wedge(\forall x)(P(x)\rightarrow P(f(x)))\rightarrow(\forall x)P(x) = U$

$U = \neg(P(a)\wedge(\forall x)(P(x)\rightarrow P(f(x))))\vee(\forall x)P(x)$

$U = \neg P(a)\vee\neg(\forall x)(P(x)\rightarrow P(f(x)))\vee(\forall x)P(x)$

$U = \neg P(a)\vee\neg(\forall x)(\neg P(x)\vee P(f(x)))\vee(\forall x)P(x)$

Aplicarea legilor finite si infinite ale lui DeMorgan

$U = \neg P(a)\vee(\exists x)(P(x)\wedge\neg P(f(x)))\vee(\forall x)P(x)$

Negarea formulei

$\neg U = \neg(\neg P(a)\vee(\exists x)(P(x)\wedge\neg P(f(x)))\vee(\forall x)P(x))$

$\neg U = P(a)\wedge(\forall x)(\neg P(x)\vee P(f(x)))\wedge(\exists x)\neg P(x)$

Redenumirea variabilelor legate astfel incat sa fie distincte

$\neg U = P(a)\wedge(\forall x)(\neg P(x)\vee P(f(x)))\wedge(\exists t)\neg P(t)$

Extragerea cuantificatorilor in fata formulei

$\neg U = (\forall x)(\exists t)P(a)\wedge(\neg P(x)\vee P(f(x)))\wedge\neg P(t) = (\neg U)P$

Eliminarea cuantificatorilor $\exists$

$t\leftarrow b$

$(\neg U)S = (\forall x)P(a)\wedge(\neg P(x)\vee P(f(x)))\wedge\neg P(b)$

Eliminarea cuantificatorilor ∀

$(\neg U)\ Sq = P(a) \wedge (\neg P(x) \vee P(f(x))) \wedge \neg P(b) = (\neg U)\ C$

$P(a) \wedge (\neg P(x) \vee P(f(x))) \wedge \neg P(b) = (\neg U)\ C$

Aplicarea metodei rezolutiei

$C1 = P(a)$

$C2 = \neg P(x) \vee P(f(x))$

$C3 = \neg P(b)$

$S = \{C1, C2, C3\}$

$Rez_{\theta}^{Pr}(C_1, C_2) = P(f(a)) = C4$

$\theta = [x \leftarrow a]$

$Rez_{\lambda}^{Pr}(C_2, C_4) = P(f(f(a))) = C5$

$\lambda = [x \leftarrow f(a)]$

Ciclu infinit, deci nu putem decide daca formula este sau nu teorema.