CENG - 424 HW-6

Convert sentences and goal into relational logic sentences and convert them into clausal form:

1) $\forall x\,(CRY(x) \Rightarrow HR(x))$

$\equiv \{\neg CRY(x),\ HR(x)\}$

2) $\forall x \forall y \forall z\,((COM(y) \Rightarrow INVEST(x,y)) \Rightarrow ((FRC(z) \Rightarrow \neg INVEST(x,z))$

$\equiv \{COM(y),\ \neg FRC(z),\ \neg INVEST(x,z)\}$ and

$\{\neg INVEST(x,y),\ \neg FRC(z),\ \neg INVEST(x,z)\}$

we can eliminate it

3) $\forall x \forall y\,(ANXIETY(x) \Rightarrow (HR(y) \Rightarrow \neg INVEST(x,y)))$

$\equiv \{\neg ANXIETY(x),\ \neg HR(y),\ \neg INVEST(x,y)\}$

4) $\forall x\,(INVEST(Alan,x) \Rightarrow ((COM(x) \wedge \neg CRY(x)) \vee (\neg COM(x) \wedge CRY(x))))$

$\equiv \{\neg INVEST(Alan,x),\ COM(x)\}$ and

$\{\neg INVEST(Alan,x),\ \neg COM(x)\}$ and

$\{\neg INVEST(Alan,x),\ CRY(x)\}$ and

$\{\neg INVEST(Alan,x),\ \neg CRY(x)\}$

Goal : $\forall z\,(ANXIETY(Alan) \Rightarrow (FRC(z) \Rightarrow \neg INVEST(Alan,z)))$

$\equiv \{\neg ANXIETY(Alan),\ \neg FRC(z),\ \neg INVEST(Alan,z)\}$

1) $\{\neg CRY(x), HR(x)\}$ Premise

2) $\{com(y), \neg FRC(z), \neg INVEST(x,z)\}$ Premise

3) $\{\neg FRC(z), \neg INVEST(x,z)\}$ Premise

4) $\{\neg ANXIETY(x), \neg HR(y), \neg INVEST(x,y)\}$ Premise

5) $\{\neg INVEST(Alan,x), com(x)\}$ Premise

6) $\{\neg INVEST(Alan,x), \neg com(x)\}$ "

7) $\{\neg INVEST(Alan,x), CRY(x)\}$ "

8) $\{\neg INVEST(Alan,x), \neg CRY(x)\}$ "

---

9) $\{\neg ANXIETY(Alan), \neg INVEST(Alan,y), \neg HR(y), \neg com(x)\}$ (4,6) $\{x \leftarrow Alan\}$

10) $\{\neg ANXIETY(Alan), \neg INVEST(Alan,z), \neg HR(z), \neg FRC(z)\}$ (2,9) $\{y \leftarrow z\}$

11) $\{\neg ANXIETY(Alan), \neg INVEST(Alan,z), \neg FRC(z), \neg CRY(z)\}$ (1,10) $\{x \leftarrow z\}$

12) $\{\neg ANXIETY(Alan), \neg INVEST(Alan,z), \neg FRC(z)\}$ (7,11) $\{x \leftarrow z\}$

$\equiv \forall z (\neg ANXIETY(Alan) \vee \neg INVEST(Alan,z) \vee \neg FRC(z))$

$\equiv \forall z (ANXIETY(Alan) \Rightarrow (FRC(z) \Rightarrow \neg INVEST(Alan,z)))$