Discrete Mathematics Exam #1

2. Prove or Disprove Underline (20pt)

  a. $\exists\, x\,[P(x)\rightarrow Q(x)] \Leftrightarrow (\exists\, x P(x))\rightarrow(\exists\, x Q(x))$

  b. $\forall\, x\,[P(x)\rightarrow Q(x)] \Leftrightarrow (\forall\, x P(x))\rightarrow(\forall\, x Q(x))$

3. Prove or Disprove underline (20pt)

  $(A\wedge B)\vee C = A\wedge(B\vee C)\Leftrightarrow A\subseteq C$

4. Prove or disprove enderline (20pt)

  $R_1 \circ (R_2\cap R_3) = (R_1 \circ R_2)\cap(R_1 \circ R_3)$

5. Prove or disprove underline (20pt)

  a. $s(R) = R\cup R^{-1}$ (s, which symmetric closure)

  b. $s(R) = R$ if and only if R is symmetric

6. Prove or disprove underline (20pt)

  $a\notin [b]_R \Leftrightarrow b\notin [a]_R$

  $(b\in [a]_R \wedge c\notin [b]_R)\Rightarrow c\notin [a]_R$