1) For each of the sentences given and the interpretation following, say whether the sentence is true where $D = \aleph$ (the natural numbers). Then do the same where $D = \Re$ (the real numbers). Remember that $\aleph$ includes 0. You may want to make a table for your answers.

   L^2: $\{<x,y> \mid x < y\}$
   I^2: $\{<x,y> \mid x = y\}$
   S^3: $\{<x,y,z> \mid x + y = z\}$
   P^3: $\{<x,y,z> \mid x \cdot y = z\}$
   a_4:4 a_{10}:10

   a) $(x)(\exists y)Lxy$
   b) $(x)(\exists y)Lyx$
   c) $(x)(y)[Lxy \rightarrow (\exists z)(Lxz \wedge Lzy)]$
   d) $(x)(\exists y)Ixy$
   e) $(x)(y)(\exists z)Sxyz$
   f) $(x)(y)(\exists z)Sxzy$
   g) $(x)(y)(\exists z)Pxzy$
   h) $(\exists x)(Lxa_4 \rightarrow Sxxa_{10})$

2) Chapter 4, ex. 10, a-d.

3) For each of the following sets of sentences, show that it is consistent by giving an interpretation in which all of its members are true.

   a) $(x)(\exists y)Fxy$
      $(x)(\exists y)-Fxy$
      $(x)(y)(Fxy \rightarrow -Fyx)$
   b) $(\exists x)(\exists y)(Fxy \wedge Fyx)$
      $(x)(y)(Fxy \rightarrow Fyc)$
      $(x)(y)(Fxy \rightarrow (Gy \rightarrow (z)Fyz))$
      $(x)(\exists y)-Fxy$