Math 300 Spring 2010 Homework 02

Due February 2

Name

Remember, you are not to discuss these problems with anyone with three exceptions: (1) discussions with me are allowed, (2) you may use any information that comes to light during a Brainstorming session and (3) if the directions to the problem specifies you may work with others.
"No, no, you're not thinking, you're just being logical." -Niels Bohr, physicist (1885-1962)

Problems

- Be ready to answer the Review Exercise Questions in Chapter 2. [You may work with others on this problem.]

I. Prove the Proposition(s) from the following list that are in the same column of the table below as your name.

Proposition 1 (2.6) *For every point P there are at least two distinct points neither of which is P.*

Proposition 2 (2.7) *For every line l there are at least two distinct lines neither of which is l.*

Proposition 3 (2.8) *If l is a line and P is a point not incident with l then there is a one-to-one correspondence between the set of points incident with l and the set of lines through P that meet l.*

Proposition 4 (2.9) *Let P be a point. Denote the set of points $\{X : X$ is on a line passing through $P\}$ by S. Then S contains every point.*

Proposition 5 (2.10) *Let l be a line. Denote the set of lines $\{m : m$ is incident with a point that lies on l or m is pa by L. Then L contains every line.*

II. Do the problem(s) in the following list that are in the same column of the table below as your name.

1. Carefully show the interpretation in Example 3 of the text is a model of Incidence geometry. Further, show this model satisfies the Euclidean parallel property.
2. Carefully show the interpretation in Example 4 of the text is a model of Incidence geometry. Further, show this model satisfies the hyperbolic parallel property.
3. Construct an interpretation of Incidence geometry in which Incidence Axioms 1 and 2 hold but 3 fails. Explain why problems II.3, II.4 and II.5 together show that it is impossible to prove any of the three axioms using only the other two. Then explain why each axiom is independent of the other two.
4. Construct an interpretation of Incidence geometry in which Incidence Axioms 2 and 3 hold but 1 fails. Explain why problems II.3, II.4 and II.5 together show that it is impossible to prove any of the three axioms using only the other two. Then explain why each axiom is independent of the other two.
5. Construct an interpretation of Incidence geometry in which Incidence Axioms 1 and 3 hold but 2 fails. Explain why problems II.3, II.4 and II.5 together show that it is impossible to prove any of the three axioms using only the other two. Then explain why each axiom is independent of the other two.

Isabelle J **Monica H**	**Dawa S** **Allison G**	**Sarah M** **Casey L**	**Kelly A** **Roy M**	**Matt E** **Greg P**	**David E** **Samantha B**	**Hannah K** **Mark M**	**Matt F** **Keith B**
Prop 2.6 II.3	Prop 2.7 II.4	Prop 2.8 II.5	Prop 2.6 II.3	Prop 2.7 II.4	Prop 2.8 II.5	Prop 2.9 II.3	Prop 2.10 II.4
Text 13(affine) Text 11	Text 14.a, b Text 11	Text 10.b Text 11	Text 10.c Text 11	Text 13 (affine) Text 11	Text 14.a, b Text 11	Text 10.b Text 11	Text 10.c Text 11