PHILADELPHIA UNIVERSITY
DEPARTMENT OF BASIC SCIENCES

Module:	Modern Euclidean Geometry	Paper:	Exam 2
Instructor:	Amin Witno	Date:	8 May 2005

Problems 1 to 6: Circle the best choice.

1. Euclidean Geometry and Hyperbolic Geometry use the same set of axioms, except the Parallelism Axiom.
   (a) True (b) False

2. All 5 of Euclid's Postulates can be proved in Neutral Geometry.
   (a) True (b) False

3. Hilbert Parallelism Axiom and Euclid's Parallel Postulate are equivalent.
   (a) True (b) False

4. Which is not a criterion for congruence between 2 triangles?
   (a) ASA
   (b) SSS
   (c) AAA
   (d) SAA
   (e) SAS

5. Given a line l and a point P not on l. Which statement cannot be proved in Neutral Geometry?
   (a) There exists a line through P perpendicular to l.
   (b) There exists a unique line through P perpendicular to l.
   (c) There exists at least one line through P parallel to l.
   (d) There exists a unique line through P parallel to l.

6. "The angle sum of any triangle is ≤ 180 degree." This theorem is
   (a) not true in Euclidean Geometry
   (b) not true in Hyperbolic Geometry
   (c) not true in Elliptic Geometry
   (d) true in Neutral Geometry only

Problems 7 to 10: Give the definitions.

7. segment AB $<$ segment CD

8. $\angle BAC \leq \angle EDF$

9. a point P is inside a circle

10. ray AD is between ray AB and ray AC

Problems 11 to 14: Write the propositions in detail.

11. Segment Subtraction

12. ASA Criterion

13. Angle Ordering

14. Every angle has a unique bisector

Problem 15: Fill in the blank with the right reasoning.

Given ΔABC and ΔDEF. If $\angle A \approx \angle D$ and $\angle C \approx \angle F$ and $AC \approx DF$ then $\Delta ABC \approx \Delta DEF$.
Proof.

1. There is a unique point G on the ray DE such that $DG \approx AB$ (_____________)
2. $\Delta ABC \approx \Delta DGF$ (______________)
3. $\angle DFG \approx \angle C$
4. ray FE = ray FG (______________)
5. G = E
6. $\Delta ABC \approx \Delta DEF$

Problem 16: Prove the following proposition.

Given ΔABC, $\angle B \approx \angle C$ if and only if $AB \approx AC$.