Math 366

Exam 1

Fall 2005

Scarborough

NEATLY PRINT NAME: _____

STUDENT ID: _____

DATE: _____

PHONE: _____

EMAIL: _____

SECTION (circle one): $502_{\text{TR3:55pm}}$ $503_{\text{TR5:30pm}}$

"On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work."

_____
Signature of student

Academic Integrity Task Force, 2004
http://www.tamu.edu/aggiehonor/FinalTaskForceReport.pdf

WRITE ALL SOLUTIONS IN THE SPACE PROVIDED; FULL CREDIT WILL NOT BE GIVEN WITHOUT CORRECT ACCOMPANYING WORK. FULLY SIMPLIFY ALL ANSWERS AND GIVE EXACT ANSWERS UNLESS OTHERWISE STATED. WHERE PROVIDED, PUT YOUR FINAL ANSWER IN THE BLANK PROVIDED. POINTS WILL BE DEDUCTED FOR SPELLING ERRORS. REMEMBER YOUR UNITS!

1. (12pts – 1pt each) True/False. Write 'true' or 'false;' do not abbreviate.

_____ a. Three or more concurrent lines necessarily determine a plane.

_____ b. All squares are rectangles and some squares are rhombuses.

_____ c. Space is the union of two mutually disjoint sets: the interior and exterior of a sphere.

_____ d. If any two distinct coplanar lines are cut by a transversal, then the corresponding angles are congruent.

_____ e. The intersection of three planes is always a single point.

_____ f. A concave, right prism has all its lateral faces bounded by rectangles.

_____ g. Some right triangles are acute triangles.

_____ h. If points P and Q line in a plane, then $\overline{PQ}$ lies in the same plane.

_____ i. All regular polyhedra are convex.

_____ j. The "Seven Bridges of Konigsberg" graph is traversable.

_____ k. If two angles share a common vertex and side, then they are adjacent angles.

_____ l. The sum of the measures of the interior angles of a convex polygon is 180 degrees.

_____ 2. (4pts) What is the maximum number of intersection points between a triangle and a hexagon, where no sides of either polygon are on the same line?

_____ 3. (5pts) If the measure of an angle is 36^{o} 47' 29", what is the measure of its supplement?

_____ 4. (6pts – 2pts each) What are the three Platonic solids that have equilateral triangles as their faces?

_____

_____

_____ 5. (4pts – 2 pts each) Given that two angles are complementary and the ratio of their measures is $\frac{8}{7}$, find the measures of the angles.

_____

6. Sketch each of the following. If not possible, write ‘impossible.’

a. (3pts) Oblique kite pyramid

b. (3pts) A traversable graph that is not an Eulerian circuit

c. (3pts) Concave pentagon

d. (3pts) Right non-circular convex cylinder

e. (3pts) Non-simple non-connected polygonal curve

f. (3pts) Net of a tetrahedron

g. (3pts) Obtuse, scalene triangle

7. (6pts) What are all the possible cross-sections when the surface of a cube is intersected by a plane? Draw a figure and then use correct terminology to name the intersections.

8. “The diagonal of a prism is any segment determined by two vertices that do not lie in the same face.”

_____a. (2pts) How many vertices per base does an n-gonal prism have?

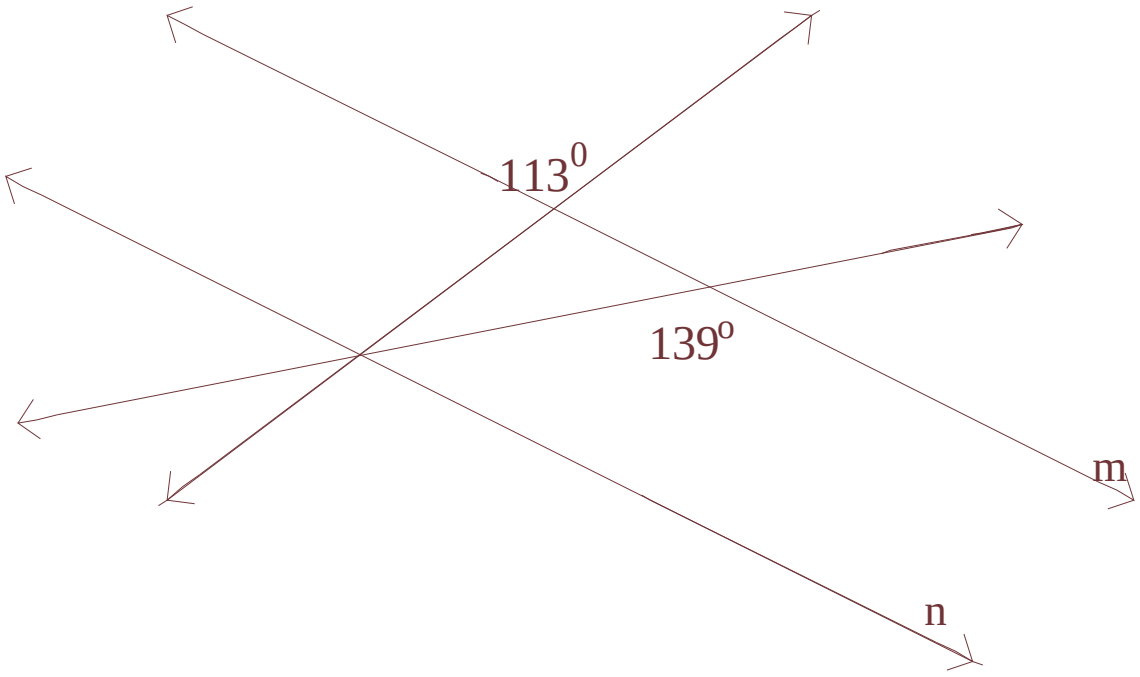
_____b. (2pts) How many diagonals per vertex does an n-gonal prism have?

_____c. (2pts) What is the total number of diagonals that an n-gonal prism has?

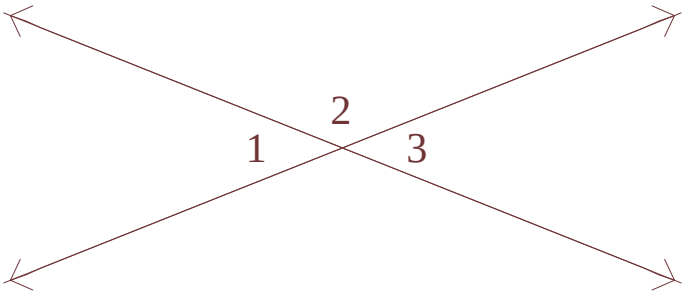
9. (5pts) In a convex octagon the smallest angle measure is 93 degrees. If the measures of all the angles form an arithmetic sequence, find the measure of the largest angle.

10. (6pts) If there are 20 points in a plane, no three of which are collinear, how many triangles can be found with those points as vertices?

11. (6pts) Given the following figure with line m parallel to line n, fill in the other 12 angle measures.



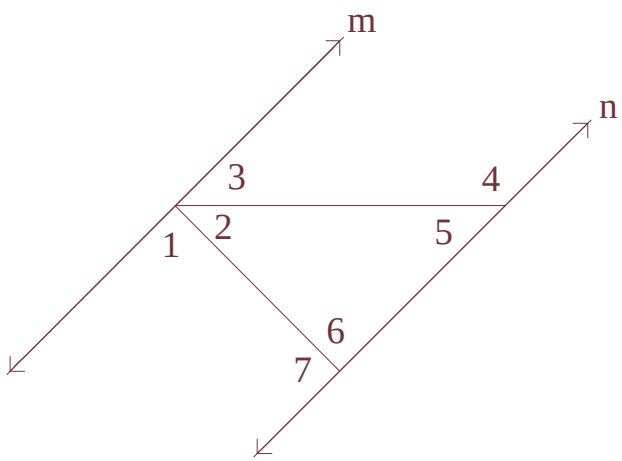
12. (9pts) Prove vertical angles are congruent.



1. intersecting lines forming vertical angles 1 and 3 and figure shown	1. Given
2.	2.

QED (*Quod erat demonstrandum*)
Latin for “which was to be demonstrated”

13. (10pts) Prove that the sum of the interior angles of a triangle is 180 degrees.



1. Line *m* is parallel to line *n*. Figure as shown.	1. Given
2.	2.

QED