COURSE: Plane Geometry (Math 32) Section 1515, Summer 2005
This course meets 10:15am – 12:20pm on MTWTh in SM AIR 335, July 5 – Aug 11.

PREREQ: Completion of Math 31 with a grade of C or better or appropriate Math Assessment score

OFFICE: MC 26

HOURS: By appointment

PHONE: Voicemail (310) 434-4722

MAIL: Students may leave written material/messages in the Student Services Office at SM AIR.

email: manion_fran@smc.edu (I try to check my email each evening.)

WEB Site: http://homepage.smc.edu/manion_fran
The Website contains copies of the syllabus, tentative lecture schedule, homework assignments, unit objectives, review sheets, announcements and links to course-related material.

Tutorial assistance, both “drop-in” and by appointment is available in the Math Lab located in room MC 84 on the Main Campus.


Materials: You will need a compass, protractor and ruler. Be sure to bring these with you to class!

COURSE DESCRIPTION
This course is equivalent to one year of high school plane geometry. Topics include sets, postulates, theorems, proofs, constructions, congruent triangles, parallels, similar polygons, regular polygons, right triangles, circles, loci, and area. Emphasis will be made on thinking, memorizing, and analyzing abstract mathematical concepts.

ENTRY SKILLS
These skills will not be taught in the class. You should already be able to:
1. Solve a proportion.
2. Solve 1st degree equations in a single variable over the rational.
3. Add and multiply monomials and polynomials.
4. Apply properties of equality and order.
5. Solve quadratic equations by factoring, completing the square and the quadratic formula
6. Solve word problems involving 1st degree equations in a single variable.
7. Solve equations involving square roots.
8. Simplify square roots.
9. Simplify and perform basic operations with numerical fractions.

EXIT SKILLS
Upon successful completion of this course, you will be able to:
A. Define basic geometric terms.
B. Distinguish between a “hypothesis” and a “conclusion”.
C. Describe the relationship between a theorem, its converse, its inverse and its contrapositive.
D. Set up and complete simple direct and indirect proofs.
E. Perform basic geometric constructions.
F. Apply geometric theorems involving:
   • similar and congruent triangles
   • parallel lines
   • parallelograms and their properties
   • lines, circles, and their properties
   • lines, circles, and their relationships
   • right triangles (Pythagorean Theorem)
STUDENT RESPONSIBILITIES
You are expected to arrive on time to class and stay for the entire class. Attendance will be taken. You may be dropped from the course if you miss four more classes. You are expected to take notes, to participate in the classwork and to do the homework. You are responsible for all announcements/assignments issued during class time. You would be wise to get the names and phone numbers of some fellow students in case you are absent and need that day’s notes, homework changes, etc.

HOMEWORK
To succeed in any math class, you must practice. Homework will be assigned at every class meeting.
- Assignments are due in “sets” on the day of each test. Each page of your homework should include, in the upper right hand corner of the page, your name, the textbook section number and the numbers of the problems presented on that page. Your homework should be LEGIBLE, NEATLY ORGANIZED and STAPLED together!!!
- The first 10 - 15 minutes of class each day will be used to review homework questions. You should be ready to ask questions each day on the assignment from the previous class. This means that you should complete daily assigned problems prior to the following class meeting to be able to ask questions and participate in a classroom discussion. This will be your only chance to ask questions on those sections.
- The sets will be graded on completeness and neatness. All problems must at least be attempted to get full credit. If you are missing problems, you will get less credit. All work must be shown! Late homework IS accepted, but for significantly fewer points. Homework scores will not be dropped. No extra credit will be given. Do your homework and you'll have no need for extra credit.
- Homework also includes pre-reading the sections scheduled for discussion at the next class. Frequent QUIZZES, (based on homework problems and lectures) will monitor students’ understanding of concepts, notation and terminology.

TIME MANAGEMENT
This class moves fast during a regular semester. During the summer it moves about three times as fast! You should expect to devote about 4 hours per day outside of class to doing homework and previewing the coming sections. If you do not have the time to commit to this class, or are not willing to commit, you should drop this now. You will not pass if you are unwilling to put in a few hours every day OUTSIDE of class. However, if you keep up with homework and ask questions each day during “Homework Time”, the tests/quizzes should come easy.

EVALUATION
There will be three UNIT TESTS during the semester. Your test scores will account for 60% of the final grade in the course. Topics included on each test are:

<table>
<thead>
<tr>
<th>Unit Test</th>
<th>Chapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1 Test</td>
<td>1 &amp; 2</td>
</tr>
<tr>
<td>Unit 2 Test</td>
<td>3 &amp; 4</td>
</tr>
<tr>
<td>Unit 3 Test</td>
<td>5 &amp; 6</td>
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</table>

Your final exam score will replace your lowest unit test score if the final exam score is higher. No tests will be dropped and no make-up tests will be given.

A comprehensive final exam will be given according to the college final exam schedule and will account for 25% in the computation of the final grade. Any student earning a grade of F on the final exam will not pass the class.

Letter grades on tests, quizzes, and the final exam will be assigned according to the following scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Range</th>
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<tbody>
<tr>
<td>A</td>
<td>90% - 100%</td>
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<tr>
<td>B</td>
<td>80% - 89%</td>
</tr>
<tr>
<td>C</td>
<td>70% - 79%</td>
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<tr>
<td>D</td>
<td>60% - 69%</td>
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<tr>
<td>F</td>
<td>below 60%</td>
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</table>
Your final grade will be calculated as a weighted average using the following formula:

\[
\text{Final Grade} = 0.05(\text{Homework}) + 0.10(\text{Participation & Quizzes}) + 0.60(\text{Test Average}) + 0.25(\text{Final Exam})
\]

Maintaining the appropriate \text{CLASSROOM CLIMATE} is the responsibility of each student.

- As a matter of courtesy, you should arrive on time for class.
- Pagers and cellular phones should be turned off or muted during class time to avoid creating a distraction.
- Food and beverages should be consumed outside the classroom.
- You are expected to be courteous to and respectful of your colleagues as well as the instructor.
- Talking during the lecture or announcements is a distraction to other students and the instructor and should be avoided.

Santa Monica College has a \text{STUDENT CONDUCT CODE} and may discipline students in accordance with its provisions. The College also has the authority to remove students from a class or program if they are disruptive of the instructional process, do not respect the civil rights of other students, cannot benefit from instruction, or present health and/or safety hazards in a class. Disciplinary sanctions include, but are not limited to, verbal or written reprimand, disciplinary probation, removal from class, ineligibility to participate in extracurricular activities, suspension, and expulsion.

Santa Monica College defines \text{ACADEMIC DISHONESTY} as the act of or assistance in deceiving, including fraud or deception, in any academic exercise. This includes, but is not limited to, the following actions not authorized by the instructor:

- Using testing aids such as calculators, tape recorders, or notes on any examination.
- Allowing another individual to assume one’s identity for the purpose of enhancing one’s grade in any of the following: testing, field trips, or attendance.
- Falsifying or attempting to falsify attendance records and/or grade rosters.
- Representing the words, ideas or work of another as one’s own in any academic exercise (plagiarism), including the use of commercial term paper companies.
- Changing answers on a previously scored test, assignment, or experiment with the intent to defraud.
- Copying or allowing another student to copy from one’s paper or answer sheet during an examination.
- Inventing information for the purpose of completing a laboratory exercise or case study with the intent to defraud.
- Giving and/or taking information during an examination by any means including sign language, hand signals, secret codes, or electronic transmission.

When taking a quiz or exam, you should keep your eyes on your own paper. Communicating (talk or body language) with another student during the exam without instructor permission is unacceptable. You are expected to do your own work on all quizzes and examinations. Students are encouraged to work together on the homework and review exercises. A first offense of academic dishonesty will result in a zero grade on that quiz or exam. A zero grade assigned as a result of academic dishonesty will NOT be dropped as the lowest score. In addition, a report will be filed with the Campus Disciplinarian.

For more detailed information, please refer to the \text{College Conduct Code and Academic Conduct Code} found posted in the classroom and in the \text{SMC Student Handbook/Guide}. 
# Tentative Schedule for Math 32

<table>
<thead>
<tr>
<th>Session</th>
<th>Text Section/Activity</th>
<th>Homework</th>
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<tbody>
<tr>
<td>Tue, 7/05</td>
<td>1.1 Statements and reasoning</td>
<td>1.1 #1,3,5,9,13,15,17,19,23,27,29,37,39,41,45,49</td>
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<tr>
<td></td>
<td>1.3 Early definitions and postulates</td>
<td>1.3 #1,13,15,17,23,25,27,29,35</td>
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<td></td>
<td></td>
<td>Get protractor, ruler and compass!!!!</td>
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<tr>
<td>Wed, 7/06</td>
<td>1.2 Informal geometry and measurement</td>
<td>1.2 #3,7,11,13,17,21,25,29,31,33,35,39,41,43,44,45</td>
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<td>1.4 Angles and their relationships</td>
<td>1.4 #5,7,11,15,17,19,21,23,29,31</td>
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<tr>
<td>Thu, 7/07</td>
<td>1.5 Introduction to geometric proof</td>
<td>1.5 #17,19,21,23,25</td>
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<td>1.6 Perpendicular lines</td>
<td>1.6 #1,3,5,9,11</td>
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<tr>
<td>Mon, 7/11</td>
<td>2.1 Parallel Postulate and Special Angles</td>
<td>2.1 #1,3,7-23 odd</td>
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<td>2.2 Indirect Proof</td>
<td>2.2 #1-9 odd, 13-21 odd</td>
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<tr>
<td>Tue, 7/12</td>
<td>2.3 Proving Lines Parallel</td>
<td>2.3 #1-31 odd</td>
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<td>2.4 The Angles of a Triangle</td>
<td>2.4 #1,3,5,7,11,13,17,21,23,25,27,31,37,39,41</td>
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<tr>
<td>Wed, 7/13</td>
<td>2.5 Convex polygons</td>
<td>2.5 #1-17 odd,21,23,27,31</td>
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<td>3.1 Congruent triangles</td>
<td>3.1 #1,3,9-31 odd,35,39</td>
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<tr>
<td>Thu, 7/14</td>
<td>Review Chapters 1 and 2</td>
<td>3.2 #1-25 odd,35</td>
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<td></td>
<td>3.2 Corresponding Parts of Congruent Triangles</td>
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<tr>
<td>Mon, 7/18</td>
<td><strong>Test 1, Chapters 1 and 2</strong></td>
<td>3.3 #1,3,5,7,17,19,23-35 odd</td>
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<td>3.3 Isosceles Triangles</td>
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<tr>
<td>Tue, 7/19</td>
<td>3.4 Basic Constructions</td>
<td>3.4 #1-25 odd,29,33,35</td>
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<td>3.5 Inequalities in a Triangle</td>
<td>3.5 #1-15 odd,21,23</td>
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<tr>
<td>Wed, 7/20</td>
<td>4.1 Properties of a Parallelogram</td>
<td>4.1 #3,5,7,9,11,17,19,21,23,25,27,29</td>
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<tr>
<td></td>
<td>4.2 Parallelograms and Kites</td>
<td>4.2 #1-13 odd,17,19,23,27,29</td>
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<tr>
<td>Thu, 7/21</td>
<td>4.3 Properties of a Parallelogram</td>
<td>4.3 #1-21 odd,27,29,31</td>
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<td>4.4 Trapezoids</td>
<td>4.4 #1-17 odd,21,23,25,27,29</td>
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<tr>
<td>Mon, 7/25</td>
<td>5.1 Ratios, rates and proportions</td>
<td>5.1 #1-25 odd,29,31</td>
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<td></td>
<td>Review Chapters 3 and 4</td>
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<tr>
<td>Tue, 7/26</td>
<td><strong>Test 2 Chapters 3 and 4</strong></td>
<td>5.2 #5,7,11,15-39 odd</td>
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<td>5.2 Similar Triangles and polygons</td>
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<td>Wed, 7/27</td>
<td>5.3 Pythagorean Theorem</td>
<td>5.3 #1-27 odd,33</td>
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<td>5.4 Special Right Triangles</td>
<td>5.4 #1-17 odd,23,25,27,29,5 #3-29 odd</td>
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<tr>
<td>Thu, 7/28</td>
<td>5.5 Segments Divided proportionally</td>
<td>5.5 #3-29 odd</td>
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<td></td>
<td>6.1 Circles and Related Segments and Angles</td>
<td>6.1 #1-17 odd, 29-37 odd</td>
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<tr>
<td>Mon, 8/01</td>
<td>6.2 More Angle measures in the Circle</td>
<td>6.2 #1-21 odd,29,33,35</td>
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<tr>
<td></td>
<td>6.3 Line and Segment Relationships in the Circle</td>
<td>6.3 #1-19 odd,23,25,35</td>
</tr>
<tr>
<td>Tue, 8/02</td>
<td>6.4 Constructions and Inequalities for the Circle</td>
<td>6.4 #1-9 odd,15,17,21,23,25</td>
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<td>6.5 Locus of Points</td>
<td>6.5 #1-9 odd,23,31,33,35,36,39</td>
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<tr>
<td>Wed, 8/03</td>
<td>6.6 Concurrency of Lines</td>
<td>6.6 #1-31 odd</td>
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<tr>
<td></td>
<td>Review Chapters 5 and 6</td>
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<tr>
<td>Thu, 8/04</td>
<td><strong>Test #3 Chapters 5 and 6</strong></td>
<td>7.1 #9-27 odd,31,33,35,37,43,45</td>
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<td></td>
<td>7.1 Area and Initial Postulates</td>
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<tr>
<td>Mon, 8/08</td>
<td>7.2 Perimeter and Area of Polygons</td>
<td>7.2 #1-19 odd,23-45 odd</td>
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<tr>
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<td>7.3 Regular Polygons and Area</td>
<td>7.3 #3-25 odd</td>
</tr>
<tr>
<td>Tue, 8/09</td>
<td>7.4 Circumference and Area of a Circle</td>
<td>7.4 #1-27 odd,33,35,37</td>
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<tr>
<td></td>
<td>7.5 More Area Relationships in the Circle</td>
<td>7.5 #1-19 odd,23-31 odd,37</td>
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<tr>
<td>Wed, 8/10</td>
<td>Final Exam Review</td>
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</tr>
<tr>
<td>Thu, 8/11</td>
<td><strong>Final Exam</strong></td>
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</table>

Policies, dates. and procedures stated on this syllabus may be changed during the course of the semester.
How to Study Geometry

Textbook:
1. Read the textbook word for word.

2. Pay special attention to undefined terms and definitions. The topics of the textbook that follow build upon this terminology.

3. When you encounter a definition:
   a. Make a drawing (to reinforce the concept).
   b. Think of other examples and counter-examples (things that do not meet the description) to compare with the defined term.
   c. State the definition in your own words (Do not just memorize a cluster of words).

4. When you encounter a postulate or theorem:
   a. Read and reread until you understand the statement.
   b. Make a drawing to illustrate the statement.
   c. Ask if the meaning would change if words were added or deleted.
   d. State the postulate or theorem in your own words.
   e. For a given theorem, ask yourself if the statement makes sense. Why should it be true?

   NOTE: You may wish to create an index card for each important term, postulate, or theorem. On the card, write the statement (the definition, postulate, or theorem), illustrate with a drawing, and include an example.

5. When you encounter a textbook example:
   a. Read it step by step, justifying each step as it unfolds.
   b. Refer to the drawings that are provided in arriving at each conclusion.
   c. Try repeating the steps of the example with the book closed.

6. When you encounter a completed proof (like an example):
   a. Note the ordering of "statements" and the justifying "reasons."
   b. Reason from the given information using the drawings that are provided.
   c. Consider the statements in reverse order noting that each statement is true because it follows logically from a statement that precedes it.
   d. Try repeating the steps with the book closed.

7. It is good to keep track of the many methods that achieve a particular goal. For example, write a list of methods for proving that triangles are congruent or that lines are parallel. For reference, see the list of postulates and theorems in the appendix of the textbook.

Assignments
1. Be sure to complete as many of the assigned problems as possible. One cannot expect to solve problems found on quizzes or tests if one has not practiced by doing assignments beforehand. If you have a Student's Solutions Manual, you must use it wisely; try the problem first, and then use the manual to help you with a difficult step. DO NOT just read the author's solution; in no way does that guarantee that you the student could generate that solution.

2. If a problem of the assignment seems difficult, try the next one. Unlike a cluster of very similar algebra problems, consecutive geometry problems are often very different. Due to a.
discovery made in solving a later problem, you can sometimes return to and solve the "difficult" problem.

3. It is important to work on an assignment solo at first. When having difficulty doing an assigned problem, you should look for a textbook example of a similar nature to serve as a guide.

4. When there are difficulties or you are frustrated, it is worthwhile to seek the help of a tutor or of a classmate. You may need to make an appointment to speak to the instructor.

Preparing for a Test
1. Handwrite a list of the definitions, postulates, and theorems included in the test material. Study the list thoroughly and then try to write each statement in your own words.

2. Study the chapter summaries and attempt chapter review exercises found at the end of each chapter of the textbook.

3. Repeat the assigned problems, especially the ones that caused difficulty.

4. If questions remain, consult your instructor, a tutor, or a study partner.

5. Preparation for a test really begins with the first day of class. It may be very important for your success in a course like geometry to form a study group . . . to study with on a regular basis and before tests.

General Behavior
1. Attend all classes. Arrive on time!

2. Develop an interest. Ask questions in class.

3. Find a study buddy or form a study group that meets regularly.

4. Utilize the instructor's office hours and tutoring services.
Learning Objectives for Chapter One
Line and Angle Relationships

Learning objectives indicate what you should be able to do upon completing your work in each of the textbook sections.

Section 1.1: Statements and Reasoning
1. determine whether a collection of words/symbols forms a statement;
2. form the negation of a given statement;
3. form the conjunction, disjunction, or implication determined by two statements; 4. recognize the hypothesis/conclusion of a conditional statement;
4. state the three types of reasoning used in geometry;
5. determine the type of reasoning used in a specific situation; and
6. recognize/apply the Law of Detachment.

Section 1.2: Informal Geometry and Measurement
1. describe the terms point, line, and plane;
2. become familiar with geometric terms such as collinear, line segment, and angle;
3. measure a line segment with a ruler/measure an angle with a protractor;
4. write equations based upon statements involving midpoint, bisect, and congruent;
5. recognize the terms right angle, straight angle, and perpendicular;
6. use the compass to construct a line segment of specified length; and
7. use the compass to determine the midpoint of a given line segment.

Section 1.3: Early Definitions and Postulates
1. know the parts of a mathematical system: undefined terms, definitions, postulates, and theorems;
2. recognize the need for/characteristics of a precise definition;
3. know the definition/symbol for line segment and its length;
4. accept and state the initial postulates involving lines and planes (in your own words);
5. use the Segment-Addition Postulate to write equations;
6. understand the concepts parallel lines and parallel planes; and
7. recognize the significance of the term "unique" as it applies to geometry.

Section 1.4: Angles and Their Relationships
1. know the definition/symbol for angle and its measure;
2. understand/use terms related to angles (like sides, vertex, etc.);
3. state/apply postulates involving an angle(s);
4. recognize the type of angle shown/measured: acute, right, obtuse, and straight;
5. use the Angle-Addition Postulate to write equations;
6. know the classifications of pairs of angles: adjacent, congruent, complementary, supplementary, and vertical;
7. use the compass to construct an angle congruent to a given angle; and
8. use the compass to construct the bisector of a given angle.
Section 1.5: Introduction to Geometric Proof
1. demonstrate the two-column form of a proof;
2. understand the role of the Given, Prove, and Drawing for a proof problem;
3. provide reasons that justify statements supplied in partial proofs; and
4. provide statements that are justified by the reasons supplied in partial proofs;

Section 1.6: Relationships: Perpendicular Lines
1. know/apply the definition of perpendicular lines in practice and proof;
2. develop an understanding of the concept of "relation;"
3. understand/apply the reflexive, symmetric, and transitive properties of congruence;
4. construct the unique line perpendicular to a line at a point on the line; and
5. construct the unique perpendicular-bisector of a given line segment.

Section 1.7: The Formal Proof of a Theorem
1. state the hypothesis and conclusion of a given theorem;
2. state the five written parts of the formal proof of a theorem;
3. make the "Drawing" for the proof of a theorem based upon the hypothesis of the theorem;
4. write the "Given" for the proof of a theorem based upon its hypothesis and the "Drawing;"
5. write the "Prove" for the proof of a theorem based upon its conclusion and the "Drawing;"
6. state/apply theorems involving perpendicular lines, complementary angles, and so on; and
7. construct/complete the formal proof of a theorem.

A Look Beyond Chapter 1: Historical Sketch of Euclid
1. recognize Euclid (Greek) as a principal contributor to geometry; and
2. know that the Elements of Euclid is the basis for any plane geometry textbook.