Chapter Audio Summary for McDougal Littell
Geometry

Chapter 2 Reasoning and Proof

In Chapter 2 you learned to analyze and rewrite conditional statements. You saw how to write postulates using conditional statements. You used symbolic notation to represent logical statements and used laws of logic to draw conclusions. Then you used properties to justify segment and angle relationships and congruence. You also proved statements about segments and angles using congruence.

Turn to the lesson-by-lesson Chapter Review that starts on p. 118 of the textbook.

Lesson 2.1 Conditional Statements

Important words to know are: *conditional statement, if-then form, hypothesis, conclusion, converse, negation, inverse, contrapositive,* and *equivalent statement.*

The first goal of Lesson 2.1 is to recognize and analyze a conditional statement. The Examples present instances of conditional statements including the inverse, converse, and contrapositive. Note that the inverse *negates* the hypothesis and conclusion. The converse *switches* the hypothesis and conclusion. In the contrapositive, you negate the hypothesis and conclusion of the *converse*.

The second goal of Lesson 2.1 is to write postulates about points, lines, and planes. There is a list of all postulates in this course at the end of the book beginning on page 827.

Now try Exercises 1 through 4. If you need help, go to the worked-out Examples on pages 71 through 74.

Lesson 2.2 Definitions and Biconditional Statements

Important words to know are: *perpendicular lines, line perpendicular to a plane,* and *biconditional statement.*

The goal of Lesson 2.2 is to recognize and use biconditional statements. Biconditional statements contain the phrase “if and only if.” In the Example, a statement and its converse are combined to form the true biconditional statement, “A number is divisible by 10 if and only if it ends in 0.”

Unlike definitions, not all postulates can be written as true biconditional statements.

Now try Exercises 5 and 6. If you need help, go to the worked-out Examples on pages 79 through 81.

Lesson 2.3 Deductive Reasoning

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Important words to know are: *logical argument, Law of Detachment,* and *Law of Syllogism.*

The first goal of Lesson 2.3 is to use symbolic notation to represent logical statements. Conditional statements can also be written using symbolic notation where *p* represents the hypothesis, and *q* represents the conclusion. The statement is read, "If *p*, then *q*." The inverse is read, "If not *p*, then not *q*." The converse is read, "If *q*, then *p*." The contrapositive is read, "If not *q*, then not *p*."

Remember, that the negation of a negative statement is a positive statement.

The second goal of Lesson 2.3 is to form conclusions by applying the laws of logic to true statements.

Now try Exercises 7 through 12. If you need help, go to the worked-out Examples on pages 87 through 90.

Lesson 2.4 Reasoning with Properties from Algebra

The first goal of Lesson 2.4 is to use properties from algebra. See the summary of algebraic properties of equality on page 96. The Example shows how to use the given information and algebraic properties to show that $m\angle 1 = 27°$. First the given information is listed. Then 105° is substituted for the measure of $\angle 2$. Then 105° is subtracted from both sides to get the measure of angle 1 equal to 27°.

Now try Exercises 13 through 19. If you need help, go to the worked-out Examples on pages 96 through 98.

Lesson 2.5 Proving Statements about Segments

Important words to know are: *theorem, two-column proof,* and *paragraph proof.*

The first goal of Lesson 2.5 is to justify statements about congruent segments.

The second goal of Lesson 2.5 is to write reasons for steps in a proof. The Example proves that $AC = 2 \bullet BC$ given that $AB = BC$. Notice that the proof begins with a statement of what is given, *AB=BC*. The Segment Addition Postulate lets you write that *AC = AB+BC*. Substituting *BC* for *AB*, you get the statement that was to be proved, $AC = 2 \bullet BC$.

Remember, that when writing a reason for a step in a proof, you must use given information, a property, a postulate, or a previously proven theorem.

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Now try Exercise 20. If you need help, go to the worked-out Examples on pages 102 and 104.

Lesson 2.6 Proving Statements about Angles

The first goal of Lesson 2.6 is to use angle congruence properties. To prove that $\angle 2 \cong \angle 3$, first list the given statements. Then use the Linear Pair Postulate to list pairs of supplementary angles. Because $\angle 1 \cong \angle 4$, you can use the Congruent Supplements Theorem to get $\angle 2 \cong \angle 3$.

The second goal of Lesson 2.6 is to prove properties about special pairs of angles, such as vertical angles.

Remember that previously proven theorems can be used as reasons in a proof, as in Step 3.

Now try Exercise 21. If you need help, go to the worked-out Examples on pages 109 through 112.