

## Chapter Audio Summary for McDougal Littell *Algebra 2*

### Chapter 1 Equations and Inequalities

In Chapter 1 you found how to use a number line to graph and order real numbers, and identify the properties of real numbers. After evaluating and simplifying algebraic expressions, you learned to solve and rewrite linear equations, including formulas. To set up and solve real-life applications, you followed a problem solving strategy. Finally, you used your new skills to solve simple and compound inequalities.

*Turn to the lesson-by-lesson Chapter Review that starts on p. 58 of the textbook.*

#### Lesson 1.1 Real Numbers and Number Operations

Important words to know are: *whole numbers, integers, rational numbers, irrational numbers, origin, graph of a real number, coordinate, opposite, and reciprocal.*

The first goal of Lesson 1.1 is to use a number line to graph and order real numbers.

To graph and order 0.3, -1, -4, and  $\sqrt{7}$ , graph the numbers on a number line. Numbers increase from left to right, so the order from least to greatest is -4, -1, 0.3,  $\sqrt{7}$ .

The second goal of Lesson 1.1 is to identify properties of and use operations with real numbers. To help you distinguish the associative and commutative properties, remember that *associate* means to group together while *commute* means to move around.

*Now try Exercises 1 through 4. If you need help, go to the worked-out Examples on pages 3 through 6.*

#### Lesson 1.2 Algebraic Expressions and Models

Important words to know are: *numerical expression, base, exponent, power, order of operations, variable, value of a variable, algebraic expression, value of an expression, mathematical model, terms of an expression, coefficient, like terms, constant terms, equivalent expressions, and identity.*

The first goal of Lesson 1.2 is to evaluate algebraic expressions.

To evaluate  $3x^2 - 1$  when  $x = -5$ , substitute  $-5$  for  $x$ . You get  $3 \cdot (-5)^2 - 1$ . Evaluate the power and multiply to get  $75 - 1$ , or 74.

The second goal of Lesson 1.2 is to simplify algebraic expressions by combining like terms and using the distributive property if necessary.

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To simplify  $2x^2 - 4x + 10x - 1$ , use the distributive property and combine like terms to get  $2x^2 + 6x - 1$ . When simplifying, pay special attention to whether or not a negative sign is included inside or outside the parentheses.

***Now try Exercises 5 through 12. If you need help, go to the worked-out Examples on pages 11 through 13.***

### **Lesson 1.3 Solving Linear Equations**

Important words to know are: *equation*, *linear equation*, *solution of an equation*, and *equivalent equations*.

The first goal of Lesson 1.3 is to solve linear equations. The second goal of Lesson 1.3 is to use linear equations to solve real-life problems.

An equation is a statement in which two expressions are equal. To solve  $-2(x - 4) = 12$ , use number properties to isolate  $x$  on one side of the equation. First use the distributive property to get  $-2x + 8 = 12$ . Subtract 8 from each side of the equation to get  $-2x = 4$ . Finally divide each side by  $-2$  to get  $x = -2$ . You can check your solution by substituting  $-2$  for  $x$  in the original equation.

***Now try Exercises 13 through 18. If you need help, go to the worked-out Examples on pages 19 through 21.***

### **Lesson 1.4 Rewriting Equations and Formulas**

The first goal of Lesson 1.4 is to rewrite equations with more than one variable. You can solve such an equation for one of its variables by isolating that variable. To solve the equation  $2x - 3y = 6$  for  $y$ , subtract  $2x$  from each side and then divide each side by  $-3$  to get  $y = \frac{2}{3}x - 2$ .

The second goal of Lesson 1.4 is to rewrite common formulas. Rewriting a formula is often easier if fractions are cleared first. Notice that multiplying each side of the equation  $A = \frac{1}{2}(b_1 + b_2)h$  by 2 clears the fraction.

***Now try Exercises 19 through 26. If you need help, go to the worked-out Examples on pages 26 through 28.***

### **Lesson 1.5 Problem Solving Using Algebraic Models**

Important words to know are: *verbal model* and *algebraic model*.

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The first goal of Lesson 1.5 is to use a problem solving plan to solve real-life problems. It is sometimes helpful when solving real-life problems to first write an equation in words before you write it in mathematical symbols. To model and solve the problem in the example, first write a verbal model: Distance = rate • time. Then assign labels: Distance =  $d$  in miles; rate = 55 miles per hour; time = 4 hours. Now write an algebraic model:  $d = 55 \cdot 4$ , or 220. You can drive 220 miles.

The second goal of Lesson 1.5 is to use other problem solving strategies such as drawing a diagram, looking for a pattern, and guess, check, and revise. When you finish solving the problem, be sure to check that you have answered the question that was asked.

***Now try Exercises 27 and 28. If you need help, go to the worked-out Examples on pages 33 through 36.***

### **Lesson 1.6 Solving Linear Inequalities**

Important words to know are: *linear inequality in one variable*, *solution of a linear inequality in one variable*, *graph of a linear inequality in one variable*, and *compound inequality*.

The goals of Lesson 1.6 are to solve simple and compound inequalities.

Solving inequalities is similar to solving equations, although there are some important differences. To solve the inequality  $4x + 1 < 7x - 5$ , first subtract  $7x$ , and then subtract 1 from each side to get  $-3x < -6$ . Then divide each side by  $-3$  to get  $x > 2$ . Remember that you must reverse the inequality symbol because you divided by a negative number.

***Now try Exercises 29 through 34. If you need help, go to the worked-out Examples on pages 42 through 44.***

### **Lesson 1.7 Solving Absolute Value Equations and Inequalities**

An important term to know is: *absolute value*.

The first goal of Lesson 1.7 is to solve absolute value equations and inequalities. The second goal of Lesson 1.7 is to use absolute value equations and inequalities to solve real-life problems.

To solve the absolute value equation  $|x + 3| = 5$ , rewrite it as two linear equations:  $x + 3 = 5$  or  $x + 3 = -5$ . Solve the equations to get  $x = 2$  or  $x = -8$ . To solve an absolute value inequality, first rewrite it as a compound inequality.

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*Now try Exercises 35 through 40. If you need help, go to the worked-out Examples on pages 50 through 52.*