1-1 Lesson Reading Guide

Variables and Expressions

Get Ready for the Lesson

Read the introduction to Lesson 1-1 in your textbook. Then complete the description of the expression 4s.

In the expression $4s$, 4 represents the ____________________ of sides and s represents the ____________________ of each side.

Read the Lesson

1. Why is the symbol $\times$ avoided in algebra?

2. What are the factors in the algebraic expression $3xy$?

3. In the expression x^n, what is the base? What is the exponent?

4. Write the Roman numeral of the algebraic expression that best matches each phrase.

a. three more than a number n _________	**I.** $5(x - 4)$
b. five times the difference of x and 4 _________	**II.** x^4
c. one half the number r _________	**III.** $\frac{1}{2}r$
d. the product of x and y divided by 2 _________	**IV.** $n + 3$
e. x to the fourth power _________	**V.** $\frac{xy}{2}$

Remember What You Learned

5. Multiplying 5 times 3 is not the same as raising 5 to the third power. How does the way you write "5 times 3" and "5 to the third power" in symbols help you remember that they give different results?

1-2 Lesson Reading Guide

Order of Operations

Get Ready for the Lesson

Read the introduction to Lesson 1-2 in your textbook.

In the expression $4.95 + 0.99(117 - 100)$, ________________ represents the regular monthly cost of internet service, ________________ represents the cost of each additional hour after 100 hours, and ________________ represents the number of hours over 100 used by Nicole in a given month.

Read the Lesson

1. The first step in evaluating an expression is to evaluate inside grouping symbols. List four types of grouping symbols found in algebraic expressions.

2. What does *evaluate powers* mean? Use an example to explain.

3. Read the order of operations on page 11 in your textbook. For each of the following expressions, write *addition*, *subtraction*, *multiplication*, *division*, or *evaluate powers* to tell what operation to use first when evaluating the expression.

a. $400 - 5[12 + 9]$

b. $26 - 8 + 14$

c. $17 + 3 \cdot 6$

d. $69 + 57 \div 3 + 16 \cdot 4$

e. $\dfrac{19 + 3 \cdot 4}{6 \div 2}$

f. $\dfrac{51 \div 729}{9^2}$

Remember What You Learned

4. The sentence *Please Excuse My Dear Aunt Sally* (PEMDAS) is often used to remember the order of operations. The letter P represents parentheses and other grouping symbols. Write what each of the other letters in PEMDAS means when using the order of operations.

NAME ____ DATE______________ PERIOD _____

1-3 Lesson Reading Guide

Open Sentences

Get Ready for the Lesson

Read the introduction to Lesson 1-3 in your textbook.

How is the open sentence different from the expression $15.50 + 5n$?

Read the Lesson

1. How can you tell whether a mathematical sentence is or is not an open sentence?

2. How would you read each inequality symbol in words?

Inequality Symbol	Words
$<$	
$>$	
$\leq$	
$\geq$	

3. Consider the equation $3n + 6 = 15$ and the inequality $3n + 6 \leq 15$. Suppose the replacement set is $\{0, 1, 2, 3, 4, 5\}$.

   a. Describe how you would find the solutions of the equation.

   b. Describe how you would find the solutions of the inequality.

   c. Explain how the solution set for the equation is different from the solution set for the inequality.

Remember What You Learned

4. Look up the word *solution* in a dictionary. What is one meaning that relates to the way we use the word in algebra?

1-4 Lesson Reading Guide

Identity and Equality Properties

Get Ready for the Lesson

Read the introduction to Lesson 1-4 in your textbook.

Write an open sentence to represent the change in rank *r* of Auburn from week 6 to week 7. Explain why the solution is the same as the solution in the introduction.

Read the Lesson

1. Write the Roman numeral of the sentence that best matches each term.

a. additive identity ________	**I.** $\frac{5}{7} \cdot \frac{7}{5} = 1$
b. multiplicative identity ________	**II.** $18 = 18$
c. Multiplicative Property of Zero ________	**III.** $3 \cdot 1 = 3$
d. Multiplicative Inverse Property ________	**IV.** If $12 = 8 + 4$, then $8 + 4 = 12$.
e. Reflexive Property ________	**V.** $6 + 0 = 6$
f. Symmetric Property ________	**VI.** If $2 + 4 = 5 + 1$ and $5 + 1 = 6$, then $2 + 4 = 6$.
g. Transitive Property ________	**VII.** If $n = 2$, then $5n = 5 \cdot 2$.
h. Substitution Property ________	**VIII.** $4 \cdot 0 = 0$

Remember What You Learned

2. The prefix *trans-* means "across" or "through." Explain how this can help you remember the meaning of the Transitive Property of Equality.

1-5 Lesson Reading Guide

The Distributive Property

Get Ready for the Lesson

Read the introduction to Lesson 1-5 in your textbook.

How would you find the amount spent by each of the first eight customers at Instant Replay Video Games on Saturday?

Read the Lesson

1. Explain how the Distributive Property could be used to rewrite $3(1 + 5)$.

2. Explain how the Distributive Property can be used to rewrite $5(6 - 4)$.

3. Write three examples of each type of term.

Term	Example
number	
variable	
product of a number and a variable	
quotient of a number and variable	

4. Tell how you can use the Distributive Property to write $12m + 8m$ in simplest form. Use the word *coefficient* in your explanation.

Remember What You Learned

5. How can the everyday meaning of the word *identity* help you to understand and remember what the additive identity is and what the multiplicative identity is?

NAME ____ DATE______________ PERIOD _____

1-6 Lesson Reading Guide

Commutative and Associative Properties

Get Ready for the Lesson

Read the introduction to Lesson 1-6 in your textbook.

How are the expressions 0.4 + 1.5 and 1.5 + 0.4 alike? different?

Read the Lesson

1. Write the Roman numeral of the term that best matches each equation.

a. $3 + 6 = 6 + 3$ ________

b. $2 + (3 + 4) = (2 + 3) + 4$ ________

c. $2 \cdot (3 \cdot 4) = (2 \cdot 3) \cdot 4$ ________

d. $2 \cdot (3 \cdot 4) = 2 \cdot (4 \cdot 3)$ ________

I. Associative Property of Addition

II. Associative Property of Multiplication

III. Commutative Property of Addition

IV. Commutative Property of Multiplication

2. What property can you use to change the order of the terms in an expression?

3. What property can you use to change the way three factors are grouped?

4. What property can you use to combine two like terms to get a single term?

5. To use the Associative Property of Addition to rewrite the sum of a group of terms, what is the least number of terms you need?

Remember What You Learned

6. Look up the word *commute* in a dictionary. Find an everyday meaning that is close to the mathematical meaning and explain how it can help you remember the mathematical meaning.

1-7 Lesson Reading Guide

Logical Reasoning and Counterexamples

Get Ready for the Lesson

Read the introduction to Lesson 1-7 in your textbook.

If you know the heat was not too high, what must have caused the popcorn to burn?

Read the Lesson

1. Write *hypothesis* or *conclusion* to tell which part of the if-then statement is underlined.

a. If it is Tuesday, then it is raining.

b. If our team wins this game, then they will go to the playoffs.

c. I can tell you your birthday if you tell me your height.

d. If $\underline{3x + 7 = 13}$, then $x = 2$.

e. If x is an even number, then $\underline{x \div 2 \text{ is an odd number}}$.

2. What does the term *valid conclusion* mean?

3. Give a counterexample for the statement *If a person is famous, then that person has been on television*. Tell how you know it really is a counterexample.

Remember What You Learned

4. Write an example of a conditional statement you would use to teach someone how to identify an hypothesis and a conclusion.

1-8 Lesson Reading Guide

Number Systems

Get Ready for the Lesson

Read the introduction to Lesson 1-8 in your textbook.

The expression $\sqrt{3600}$ is read, "the square root of 3600." How would you read the expression $\sqrt{64}$?

Read the Lesson

Complete each statement below.

1. The symbol $\sqrt{}$ is called a ___________________________ and is used to indicate a nonnegative or principal square root of the expression under the symbol.

2. A ___________________________ of an irrational number is a rational number that is close to, but not equal to, the value of the irrational number.

3. The positive square root of a number is called the ___________________________ square root of the number.

4. A number whose positive square root is a rational number is a ___________________________.

5. Write each of the following as a mathematical expression that uses the $\sqrt{}$ symbol.

a. the positive square root of 1600

b. the negative square root of 729

c. the principal square root of 3025

6. The irrational numbers and rational numbers together form the set of ___________________________ numbers.

Remember What You Learned

7. Use a dictionary to look up several words that begin with "ir-". What does the prefix "ir-" mean? How can this help you remember the meaning of the word *irrational*?

NAME ____ DATE______________ PERIOD _____

1-9 Lesson Reading Guide

Functions and Graphs

Get Ready for the Lesson

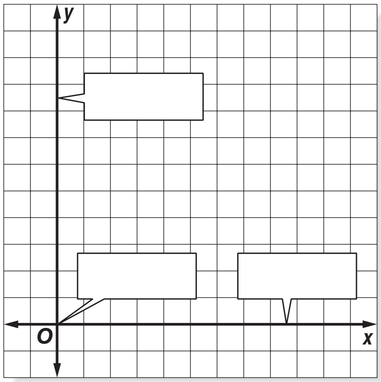
Read the introduction to Lesson 1-9 in your textbook.

The numbers 25%, 50% and 75% represent the ____ and the numbers 0 through 10 represent the ____.

Read the Lesson

1. Write another name for each term.
   - **a.** coordinate system
   - **b.** horizontal axis
   - **c.** vertical axis

2. Identify each part of the coordinate system.



3. In your own words, tell what is meant by the terms *dependent variable* and *independent variable*. Use the example below.

dependent variable		independent variable
the distance it takes to stop a motor vehicle	is a function of	the speed at which the vehicle is traveling
d		*s*

Remember What You Learned

4. In the alphabet, x comes before y. Use this fact to describe a method for remembering how to write ordered pairs.

2-1 Lesson Reading Guide

Writing Equations

Get Ready for the Lesson

Read the introduction to Lesson 2-1 in your textbook.

Does the equation $305 - s = 154$ also represent the situation? Explain.

Read the Lesson

1. Translate each sentence into an equation.

a.

Two	times	the sum of *x* and three	minus	four	equals	four	times	*x*.

b.

The difference of *k* and 3	is	two	times	*k*	divided by	five.

2. A 1-oz serving of chips has 140 calories. There are about 14 servings of chips in a bag. How many calories are there in a bag of chips? Write what your solution would be as you use each step in the Four-Step Problem-Solving Plan.

Explore What do you know?

What do you want to know?

Plan Write an equation.

Solve Solve the problem.

Check Does your answer make sense?

Remember What You Learned

3. If you cannot remember all the steps of the Four-Step Problem-Solving Plan, try to remember the first letters of the first word in each step. Write those letters here with their associated words.

NAME ____ DATE______________ PERIOD _____

2-2 Lesson Reading Guide

Solving Equations by Using Addition and Subtraction

Get Ready for the Lesson

Read the introduction to Lesson 2-2 in your textbook.

In the equation $66 = m - 50$, the number 5 represents

____

____

and the number 66 represents

____

____

Read the Lesson

1. To solve $x + 17 = 46$ using the Subtraction Property of Equality, you would subtract ___________ from each side.

2. To solve $y - 9 = -30$ using the Addition Property of Equality, you would add ___________ to each side.

3. Write an equation that you could solve by subtracting 32 from each side.

4. A student used the Subtraction Property of Equality to solve an equation. Explain why it would also be possible to use the Addition Property of Equality to solve the equation.

Remember What You Learned

5. Explain how you decide whether to use the Addition Property or the Subtraction Property of Equality to solve an equation.

2-3 Lesson Reading Guide

Solving Equations by Using Multiplication and Division

Get Ready for the Lesson

Read the introduction to Lesson 2-3 in your textbook.

- In the equation $rt = d$, shown in the introduction, what number is used for r? for d?
- What equation could you use to find the time it takes light to reach Earth from the farthest star in the Big Dipper?

Read the Lesson

Complete the sentence after each equation to tell how you would solve the equation.

1. $\frac{x}{7} = 16$ ___________________ each side by _________.

2. $5x = 125$ ___________________ each side by _________, or multiply each side by _________.

3. $-8k = 96$ Divide each side by _________, or multiply each side by _________.

4. Explain how rewriting $4\frac{1}{3}x = 2\frac{1}{8}$ as $\frac{13}{3}x = \frac{17}{8}$ helps you solve the equation.

Remember What You Learned

5. One way to remember something is to explain it to someone else. Write how you would explain to a classmate how to solve the equation $\frac{2}{3}x = 12$.

NAME ____ DATE______________ PERIOD _____

2-4 Lesson Reading Guide

Solving Multi-Step Equations

Get Ready for the Lesson

Read the introduction to Lesson 2-4 in your textbook.

- Write the equation $8 + 12a = 124$ in words.
- How many operations are involved in the equation?

Read the Lesson

1. What does the phrase *undo the operations* mean to you? Give an example.

2. a. If we undo operations in reverse of the order of operations, what operations do we do first?

b. What operations do we do last?

3. Suppose you want to solve $\frac{x+3}{5} = 6$.

a. What is the grouping symbol in the equation $\frac{x+3}{5} = 6$?

b. What is the first step in solving the equation?

c. What is the next step in solving the equation?

4. Write an equation for the problem below.

Seven	times	*k*	minus	five	equals	negative forty-seven

Remember What You Learned

5. Explain why working backward is a useful strategy for solving equations.

2-5 Lesson Reading Guide

Solving Equations with the Variable on Each Side

Get Ready for the Lesson

Read the introduction to Lesson 2-5 in your textbook.

In the equation $46 \cdot 9 - 3x = 26 + 8x$, what do $3x$ and $8x$ represent?

Read the Lesson

1. Suppose you want to help a friend solve $6k + 7 = 3k - 8$. What would you advise her to do first? Why?

2. When solving $2(3x - 4) = 3(x + 5)$, why is it helpful first to use the Distributive Property to remove the grouping symbols?

3. On a quiz, Jason solved three equations. His teacher said all the work was correct, but she asked him to write short sentences to tell what the solutions were. In what follows, you see the *last* equation in his work for each equation. Write sentences to describe the solutions.

a. $x = -4$

b. $6m = 6m$

c. $12 = 37$

4. In Question 3, one of the equations Jason solved was an identity. Which equation was it? Explain how you know.

Remember What You Learned

5. An equation with variables is an identity when the equation is always true. In other words, the expressions on the left and right sides always have the same value. Look up the word *identity* in the dictionary. Write all the definitions that are similar to the mathematical definition.

NAME ____ DATE______________ PERIOD _____

2-6 Lesson Reading Guide

Ratios and Proportions

Lesson 2-6

Getting Ready for the Lesson

Read the introduction to Lesson 2-6 in your textbook.

- How many servings of honey frozen yogurt are made by this recipe?
- How many recipes would be needed to make enough honey frozen yogurt for all the students in your class?

Read the Lesson

1. Complete the following sentence.

A ratio is a comparison of two numbers by ______________________.

2. Describe two ways to decide whether the sentence $\frac{2}{5} = \frac{8}{20}$ is a proportion.

3. For each proportion, tell what the extremes are and what the means are.

a. $\frac{14}{35} = \frac{6}{15}$ Extremes: ______________________ Means: ______________________

b. $\frac{6}{8} = \frac{12}{16}$ Extremes: ______________________ Means: ______________________

4. A jet flying at a steady speed traveled 825 miles in 2 hours. If you solved the proportion $\frac{825}{2} = \frac{x}{1.5}$, what would the answer tell you about the jet?

Remember What You Learned

5. Write how you would explain solving a proportion to a friend who missed Lesson 3-6.

NAME ____ DATE______________ PERIOD _____

2-7 Lesson Reading Guide

Percent of Change

Get Ready for the Lesson

Read the introduction to Lesson 2-7 in your textbook.

- How many area codes were in use in 1947?
- How many *more* area codes were in use in 1999?

Read the Lesson

1. If you use (original amount) — (new amount) to find the change for a percent of change problem, then the problem involves a percent of ______________________ (increase/decrease).

2. If you use (new amount) — (original amount) to find the change for a percent of change problem, then the problem involves a percent of ______________________ (increase/decrease).

Complete the chart.

	Original Amount	New Amount	Percent Proportion	Percent Increase or Percent Decrease?
3.	10	13		
4.	10	7		
5.	50	42		
6.	50	58		

7. When you find a discount price, do you add to or subtract from the original price?

Remember What You Learned

8. If you remember only two things about the ratio used for finding percent of change, what should they be?

2-8 Lesson Reading Guide

Solving Equations and Formulas

Get Ready for the Lesson

Read the introduction to Lesson 2-8 in your textbook.

The equation $g(195 - h) = \frac{1}{2}v^2$ contains several variables. What number values do you know for these variables in this situation?

Read the Lesson

1. Suppose you have an equation with several variables. You want to solve for a particular variable. How does the procedure compare with that for solving an equation with just one variable? How does the solution compare with the solution for an equation with one variable?

2. Describe what dimensional analysis involves.

3. What do you have to be careful about when you use variables in denominators of fractions?

Remember What You Learned

4. When you give the dimensions of a rectangle, you have to tell how many units long it is and how many units wide it is. How can this help you remember what dimensional analysis involves.

NAME ______________________________ DATE______________ PERIOD _____

2-9 Lesson Reading Guide

Weighted Averages

Get Ready for the Lesson

Read the introduction to Lesson 2-9 in your textbook.

Why is the sum of the skater's scores divided by 3?

Read the Lesson

1. Read the definition of *weighted average* on page 171 of your textbook. What is meant by the weight of a number in a set of data?

2. Linda's quiz scores in science are 90, 85, 85, 75, 85, and 90. What is the weight of the score 85?

3. Suppose Clint drives at 50 miles per hour for 2 hours. Then he drives at 60 miles per hour for 3 hours.

a. Write his speed for each hour of the trip.

Speed					
Hour	1	2	3	4	5

b. What is the weight of each of the two speeds?

Remember What You Learned

4. Making a table can be helpful in solving mixture problems. In your own words, explain how you use a table to solve mixture problems.

Lesson 2-9

3-1 Lesson Reading Guide

Representing Relations

Getting Ready for the Next Lesson

Read the introduction to Lesson 3-1 in your textbook.

In 2001, Ken Griffey, Jr. had ________ home runs and ________ strikeouts.

This can be represented with the ordered pair (________, ________).

Read the Lesson

1. Look at page 141 in your textbook. There you see the same relation represented by a set of ordered pairs, a table, a graph, and a mapping.

a. In the list of ordered pairs, where do you see the numbers for the domain? the numbers for the range?

b. What parts of the table show the domain and the range?

c. How do the table, the graph, and the mapping show that there are three ordered pairs in the relation?

2. Which tells you more about a relation, a list of the ordered pairs in the relation or the domain and range of the relation? Explain.

3. Describe how you would find the inverse of the relation {(1, 2), (2, 4), (3, 6), (4, 8)}.

Remember What You Learned

4. The first letters in two words and their order in the alphabet can sometimes help you remember their mathematical meaning. Two key terms in this lesson are *domain* and *range*. Describe how the alphabet method could help you remember their meaning.

3-2 Lesson Reading Guide

Representing Functions

Get Ready for the Lesson

Read the introduction to Lesson 3-2 in your textbook.

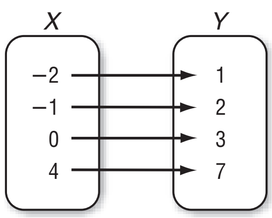
If pressure is the independent variable and temperature is the dependent variable, what are the ordered pairs for this set of data?

Read the Lesson

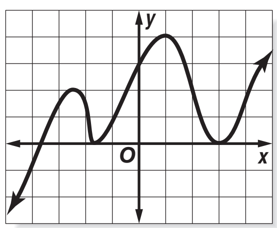
1. The statement, "Relations in which each element of the range is paired with exactly one element of the domain are called functions," is false. How can you change the underlined words to make the statement true?

2. Describe how each method shows that the relation represented is a function.

a. mapping



b. vertical line test



Remember What You Learned

3. A student who was trying to help a friend remember how functions are different from relations that are not functions gave the following advice: *Just remember that functions are very strict and never give you a choice*. Explain how this might help you remember what a function is.

3-3 Lesson Reading Guide

Linear Functions

Getting Ready for the Next Lesson

Read the introduction to Lesson 3-3 in your textbook.

In the equation $f = 0.3\left(\frac{C}{9}\right)$, what are the independent and dependent variables?

Read the Lesson

1. Describe the graph of a linear equation.

2. Determine whether each equation is a linear equation. Explain.

	Equation	Linear or non-linear?	Explanation
a.	$2x = 3y + 1$		
b.	$4xy + 2y = 7$		
c.	$2x^2 = 4y - 3$		
d.	$\frac{x}{5} - \frac{4y}{3} = 2$		

3. What do the terms *x-intercept* and *y-intercept* mean?

Remember What You Learned

4. Describe two methods you could use to graph $4x + 2y = 8$.

3-4 Lesson Reading Guide

Arithmetic Sequences

Get Ready for the Lesson

Read the introduction to Lesson 3-4 in your textbook.

Describe the pattern in the data.

Read the Lesson

1. Do the recorded altitudes in the introduction form an arithmetic sequence? Explain.

2. What is meant by *successive terms*?

3. Complete the table.

	Pattern	Is the sequence increasing or decreasing?	Is there a common difference? If so, what is it?
a.	2, 5, 8, 11, 14, …		
b.	55, 50, 45, 40, …		
c.	1, 2, 4, 9, 16, …		
d.	$\frac{1}{2}$, 0, $-\frac{1}{2}$, −1, …		
e.	2.6, 2.9, 3.2, 3.5, …		

Remember What You Learned

4. Use the pattern 3, 7, 11, 15, … to explain how you would help someone else learn how to find the 10th term of an arithmetic sequence.

3-5 Lesson Reading Guide

Describing Number Patterns

Get Ready for the Lesson

Read the introduction to Lesson 3-5 in your textbook.

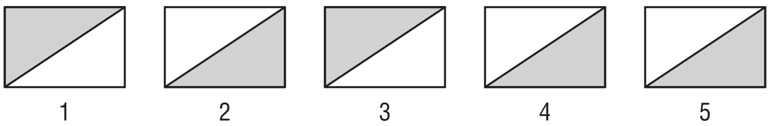
- What is meant by the term *linear pattern*?

- Describe any arithmetic sequences in the data.

Read the Lesson

1. What is meant by the term *inductive reasoning*?

2. For the figures below, explain why Figure 5 does not follow the pattern.



3. Describe the steps you would use to find the pattern in the sequence 1, 5, 25, 125, … .

Remember What You Learned

4. What are some basic things to remember when you are trying to discover whether there is a pattern in a sequence of numbers?

NAME ____ DATE______________ PERIOD _____

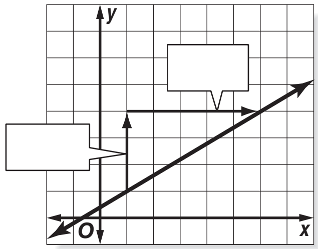
4-1 Lesson Reading Guide

Rate of Change and Slope

Get Ready for the Lesson

Read the introduction to Lesson 4-1 in your textbook.

Complete the definition of slope and fill in the boxes on the graph with the words ***rise*** and ***run***.



slope = ——

In this graph, the rise is ______ units, and the run is ______ units.

Thus, the slope of this line is $\frac{\text{units}}{\text{units}}$ or —.

Read the Lesson

1. Describe each type of slope and include a sketch.

Type of Slope	Description of Graph	Sketch
positive		
negative		
zero		
undefined		

2. Describe how each expression is related to *slope*.

a. $\frac{y_2 - y_1}{x_2 - x_1}$

b. $\frac{\text{rise}}{\text{run}}$

c. $\frac{\text{\$52,000 increase in spending}}{\text{26 months}}$

Remember What You Learned

3. The word *rise* is usually associated with going up. Sometimes going from one point on the graph does not involve a rise and a run but a fall and a run. Describe how you could select points so that it is always a rise from the first point to the second point.

4-2 Lesson Reading Guide

Slope and Direct Variation

Get Ready for the Lesson

Read the introduction to Lesson 4-2 in your textbook.

- How do the numbers in the table relate to the graph shown?
- Think about the first sentence. What does it mean to say that it costs about $2.25 per ringtone that you download for your cell phone?

Read the Lesson

1. What is the form of a direct variation equation?

2. How is the constant of variation related to slope?

3. The expression "y varies directly as x" can be written as the equation $y = kx$. How would you write an equation for "w varies directly as the square of t"?

4. For each situation, write an equation with the proper constant of variation.

a. The distance d varies directly as time t, and a cheetah can travel 88 feet in 1 second.

b. The perimeter p of a pentagon with all sides of equal length varies directly as the length s of a side of the pentagon. A pentagon has 5 sides.

c. The wages W earned by an employee vary directly with the number of hours h that are worked. Enrique earned $172.50 for 23 hours of work.

Remember What You Learned

5. Look up the word *constant* in a dictionary. How does this definition relate to the term constant of variation?

4-3 Lesson Reading Guide

Graphing Equations in Slope-Intercept Form

Get Ready for the Lesson

Read the introduction to Lesson 4-3 in your textbook.

- What point on the graph shows that shipping costs $3.00?
- How does the rate of $0.99 per book relate to the graph?

Read the Lesson

1. Fill in the boxes with the correct words to describe what m and b represent.

$$y = mx + b$$

2. What are the slope and y-intercept of a vertical line?

3. What are the slope and y-intercept of a horizontal line?

4. Read the problem. Then answer each part of the exercise.

A ruby-throated hummingbird weighs about 0.6 gram at birth and gains weight at a rate of about 0.2 gram per day until fully grown.

a. Write a verbal equation to show how the words are related to finding the average weight of a ruby-throated hummingbird at any given week. Use the words *weight at birth*, *rate of growth*, *weight*, and *weeks after birth*. Below the equation, fill in any values you know and put a question mark under the items that you do not know.

	=		×		+	

b. Define what variables to use for the unknown quantities.

c. Use the variables you defined and what you know from the problem to write an equation.

Remember What You Learned

5. One way to remember something is to explain it to another person. Write how you would explain to someone the process for using the y-intercept and slope to graph a linear equation.

NAME ____ DATE______________ PERIOD _____

4-4 Lesson Reading Guide

Writing Equations in Slope-Intercept Form

Get Ready for the Lesson

Read the introduction to Lesson 4-4 in your textbook.

- What is the rate of change per year?
- Study the pattern on the graph. How would you find the population in 2005?

Read the Lesson

1. Suppose you are given that a line goes through (2, 5) and has a slope of −2. Use this information to complete the following equation.

$$y \quad = \quad mx \quad + \quad b$$

$$\boxed{} = \boxed{} \cdot \boxed{} + \boxed{}$$

2. What must you first do if you are not given the slope in the problem?

3. What is the first step in answering any standardized test practice question?

4. What are four steps you can use in solving a word problem?

5. Define the term *linear extrapolation*.

Remember What You Learned

6. In your own words, explain how you would answer a question that asks you to write the slope-intercept form of an equation.

4-5 Lesson Reading Guide

Writing Equations in Point-Slope Form

Get Ready for the Lesson

Read the introduction to Lesson 4-5 in your textbook.

Note that in the final equation there is a value subtracted from x and from y. What are these values?

Read the Lesson

1. In the formula $y - y_1 = m(x - x_1)$, what do x_1 and y_1 represent?

2. Complete the chart below by listing three forms of equations. Then write the formula for each form. Finally, write three examples of equations in those forms.

Form of Equation	Formula	Example

3. Refer to Example 5 on page 288 of your textbook. What do you think the *hypotenuse* of a right triangle is?

Remember What You Learned

4. Suppose you could not remember all three formulas listed in the table above. Which of the forms would you concentrate on for writing linear equations? Explain why you chose that form.

4-6 Lesson Reading Guide

Statistics: Scatter Plots and Lines of Fit

Get Ready for the Lesson

Read the introduction to Lesson 4-6 in your textbook.

- What does the phrase linear relationship mean to you?
- Write three ordered pairs that fit the description *as x increases, y decreases*.

Read the Lesson

1. Look up the word *scatter* in a dictionary. How does this definition compare to the term *scatter plot*?

2. What is a *line of fit*? How many data points fall on the line of fit?

3. What is *linear interpolation*? How can you distinguish it from linear *extrapolation*?

Remember What You Learned

4. How can you remember whether a set of data points shows a positive correlation or a negative correlation?

4-7 Lesson Reading Guide

Geometry: Parallel and Perpendicular Lines

Get Ready for the Lesson

Read the introduction to Lesson 4-7 in your textbook.

- What is a family of graphs?
- Do you think lines that do not appear to intersect are parallel or perpendicular?

Reading the Lesson

1. Refer to the Key Concept box on the same page. Why does the definition use the term *nonvertical* when talking about lines with the same slope?

2. What is a right angle?

3. Refer to the Key Concept box. Describe how you find the opposite reciprocal of a number.

4. Write the opposite reciprocal of each number.

a. 2 **b.** -3 **c.** $\frac{12}{13}$ **d.** $-\frac{1}{5}$

Remember What You Learned

5. One way to remember how slopes of parallel lines are related is to say "same direction, same slope." Try to think of a phrase to help you remember that perpendicular lines have slopes that are opposite reciprocals.

5-1 Lesson Reading Guide

Graphing Systems of Equations

Get Ready for the Lesson

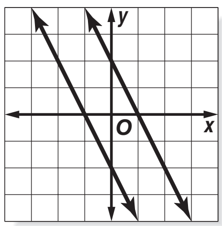
Read the introduction to Lesson 7-1 in your textbook.

- What is meant by the term *linear function?*
- What does it mean to say that *two lines intersect?*

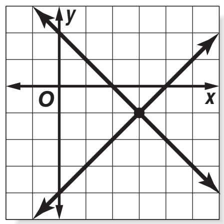
Read the Lesson

1. Each figure shows the graph of a system of two equations. Write the letter of the figures that illustrate each statement.

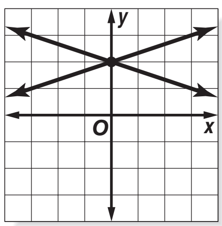
A.



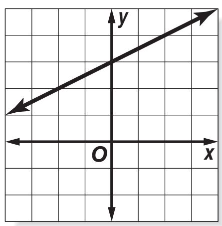
B.



C.



D.



a. A system of two linear equations can have an infinite number of solutions.

b. A system of equations is consistent if there is at least one ordered pair that satisfies both equations.

c. If two graphs are parallel, there are no ordered pairs that satisfy both equations.

d. If a system of equations has exactly one solution, it is independent.

e. If a system of equations has an infinite number of solutions, it is dependent.

Remember What You Learned

2. Describe how you can solve a system of equations by graphing.

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5-2 Lesson Reading Guide

Substitution

Get Ready for the Lesson

Read the introduction to Lesson 5-2 in your textbook.

- What is the system of equations?
- Based on the graph, are there 0, 1, or infinitely many solutions of the system?

Read the Lesson

1. Describe how you would use substitution to solve each system of equations.

a. $y = -2x$
$x + 3y = 15$

b. $3x - 2y = 12$
$x = 2y$

c. $x + 2y = 7$
$2x - 8y = 8$

d. $-3x + 5y = 81$
$2x + y = 24$

2. Jess solved a system of equations and her result was $-8 = -8$. All of her work was correct. Describe the graph of the system. Explain.

3. Miguel solved a system of equations and his result was $5 = -2$. All of his work was correct. Describe the graph of the system. Explain.

Remember What You Learned

4. What is usually the first step in solving a system of equations by substitution?

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5-3 Lesson Reading Guide

Elimination Using Addition and Subtraction

Get Ready for the Lesson

Read the introduction to Lesson 5-3 in your textbook.

What fact explains why the variable *d* gets eliminated from the system of equations?

Read the Lesson

1. Write *addition* or *subtraction* to tell which operation it would be easiest to use to eliminate a variable of the system. Explain your choice.

	System of Equations	Operation	Explanation
a.	$3x + 5y = 12$ $-3x + 2y = 6$		
b.	$3x + 5y = 7$ $3x - 2y = 8$		
c.	$-x - 4y = 9$ $4x - 4y = 6$		
d.	$5x - 7y = 17$ $8x + 7y = 9$		

Remember What You Learned

2. Tell how you can decide whether to use addition or subtraction to eliminate a variable in a system of equations.

5-4 Lesson Reading Guide

Elimination Using Multiplication

Get Ready for the Lesson

Read the introduction to Lesson 5-4 in your textbook.

Can the system of equations be solved by elimination with addition or subtraction? Explain.

Reading the Lesson

1. Could elimination by multiplication be used to solve the system shown below? Explain.

$$\begin{aligned} 3x - 5y &= 15 \\ -6x + 7y &= 11 \end{aligned}$$

2. Tell whether it would be easiest to use substitution, elimination by addition, elimination by subtraction, or elimination by multiplication to solve the system. Explain your choice.

	System of Equations	Solution Method	Explanation
a.	$-3x + 4y = 2$ $3x + 2y = 10$		
b.	$x - 2y = 0$ $5x - 4y = 8$		
c.	$6x - 5y = -18$ $2x + 10y = 27$		
d.	$-2x + 3y = 9$ $3x + 3y = 12$		

Remember What You Learned

3. If you are going to solve a system by elimination, how do you decide whether you will need to multiply one or both equations by a number?

5-5 Lesson Reading Guide

Applying Systems of Linear Equations

Get Ready For the Lesson

Do the activity at the beginning of the lesson in your textbook.

a. Write an equation to describe the total length of both tours.

b. Write an equation to describe the relationship between the length of the Crystal Palace tour and then Horseshoe Lake tour.

c. Combine both equations into a system of equations. Use any method to solve for the lengths of the tours.

Read the Lesson

Complete the following chart.

Method	The Best Time to Use
Graphing	
Substitution	
Elimination Using Addition	
Elimination Using Subtraction	
Elimination Using Multiplication	

Remember What You Learned

7. Think of an example of a system of linear equations you have seen earlier in this lesson. Explain what the benefits or drawbacks might be for using each of the methods for solving systems of linear equations.

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6-1 Lesson Reading Guide

Solving Inequalities by Addition and Subtraction

Get Ready for the Lesson

Read the introduction to Lesson 6-1 in your textbook.

- Use the information in the graph to write an inequality statement about participation in two sports.

- Rewrite your inequality statement to show that 40 schools added both of the sports. Is the statement still true?

Read the Lesson

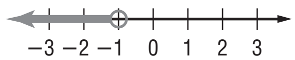
Write the letter of the graph that matches each inequality.

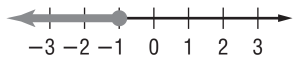
1. $x \leq -1$ __________

2. $x \geq -1$ __________

3. $x < -1$ __________

4. $x > -1$ __________

a.


b.


c.


d.


5. Use the chart to write a sentence that could be described by the inequality $3n \geq 2n + 7$. Then solve the inequality.

Inequalities			
$<$	$>$	$\leq$	$\geq$
less than fewer than	greater than more than	at most no more than less than or equal to	at least no less than greater than or equal to

Remember What You Learned

6. Teaching someone else can help you remember something. Explain how you would teach another student who missed class to solve the inequality $2x + 4 \leq 3x$.

6-2 Lesson Reading Guide

Solving Inequalities by Multiplication and Division

Get Ready for the Lesson

Read the introduction to Lesson 6-2 in your textbook.

- Would a wall 6 bricks high be lower than a wall 6 blocks high? Why?

- Would a wall n bricks high be lower than a wall n blocks high? Explain.

Read the Lesson

1. Write an inequality that describes each situation.

a. A number n divided by 8 is greater than 5.

b. Twelve times a number k is at least 7.

c. A number x divided by -10 is less than or equal to 50.

d. Three fifths of a number n is at most 13.

e. Nine is greater than or equal to one half of a quantity m.

2. Use words to tell what each inequality says.

a. $12 < 6n$

b. $\frac{t}{-3} \geq 14$

c. $11x \leq 32$

Remember What You Learned

3. In your own words, write a rule for multiplying and dividing inequalities by positive and negative numbers.

6-3 Lesson Reading Guide

Solving Multi-Step Inequalities

Get Ready for the Lesson

Read the introduction to Lesson 6-3 in your textbook.

Suppose that the temperature in the Sahara desert is 60.5° F at 9:00 A.M., and it continues to increase until noon. Write an inequality that represents the possible temperatures of the Sahara desert at noon in degrees Celcius.

Read the Lesson

1. What does the phrase “undoing the operations in reverse of the order of operations” mean?

2. Describe how checking the solution of an inequality is different from checking the solution of an equation.

3. Describe how the Distributive Property can be used to remove the grouping symbols in the inequality $4x - 7(2x + 8) \leq 3x - 5$.

4. Is it possible to have no solution when you solve an inequality? Explain your answer and give an example.

Remember What You Learned

5. Make a checklist of steps you can use when solving inequalities.

6-4 Lesson Reading Guide

Solving Compound Inequalities

Get Ready for the Lesson

Read the introduction to Lesson 6-4 in your textbook.

- Explain why it is possible that a rider weighs 150 pounds.

- Explain why it is *not* possible that a rider weighs 270 pounds.

Read the Lesson

1. When is a compound inequality containing *and* true?

2. The graph of a compound inequality containing *and* is the ________________________ of the graphs of the two inequalities.

3. When is a compound inequality containing *or* true?

4. The graph of a compound inequality containing *or* is the ________________________ of the graphs of the two inequalities.

5. Suppose you use yellow to show the graph of Inequality #1 on the number line. You use blue to show the graph of Inequality #2. Write *and* or *or* in each blank to complete the sentence.

a. The part that is green is the graph of Inequality #1 ____________ Inequality #2.

b. All colored parts form the graph of Inequality #1 ____________ Inequality #2.

Remember What You Learned

6. One way to remember something is to connect it to something that is familiar to you. Write two *true* compound statements about yourself, one using the word *and* and the other using the word *or*.

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6-5 Lesson Reading Guide

Solving Open Sentences Involving Absolute Value

Get Ready for the Lesson

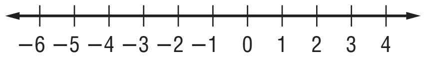
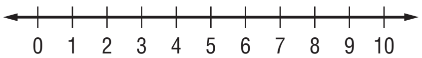
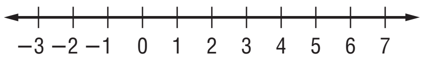
Read the introduction to Lesson 6-5 in your textbook.

- What does the phrase margin of error mean to you?

- In this poll, the number of students favoring notebook computers over other technology may be as high as ________ or as low as ________. This can be written as the inequality $|x - \_\_\_\_\_\_\_\_| = 3$.

Read the Lesson

Complete each compound sentence by writing *and* or *or* in the blank. Use the result to help you graph the absolute value sentence.

	Absolute Value Sentence	Compound Sentence	Graph
1.	$\lvert 2x + 2 \rvert = 8$	$2x + 2 = 8$ ________ $2x + 2 = -8$	
2.	$\lvert x - 5 \rvert = 4$	$x - 5 = 4$ ________ $x - 5 = -4$	
3.	$\lvert 2x - 3 \rvert = 5$	$2x - 3 = 5$ ________ $2x - 3 = -5$	

4. How would you write the compound sentence $3x + 7 = 5$ or $3x + 7 = -5$ as an absolute value sentence?

Remember What You Learned

5. Recall that $|x|$ tells you how many units the number x is from zero on the number line. Explain the meaning of $|x| = n$ by using the idea of the distance from x to zero.

6-6 Lesson Reading Guide

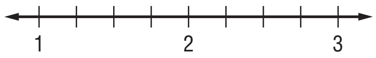
Solving Inequalities Involving Absolute Value

Get Ready for the Lesson

Read the introduction to Lesson 6-6 in your textbook.

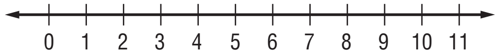
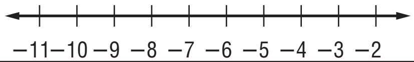
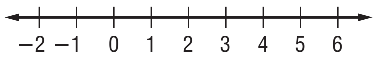
- Write an open sentence involving absolute value for the length of baby carrots.

- Graph the solution set.



Reading the Lesson

Complete each compound sentence by writing *and* or *or* in the blank. Use the result to help you graph the absolute value sentence.

	Absolute Value Sentence	Compound Sentence	Graph
1.	$\lvert x - 6\rvert < 4$	$x - 6 < 4$ ___ $x - 6 > -4$	
2.	$\lvert x + 8\rvert \geq 2$	$x + 8 \geq 2$ ____ $x + 8 \leq -2$	
3.	$\lvert 2x - 5\rvert > 3$	$2x - 5 > 3$ ___ $2x - 5 < -3$	

4. How would you write the compound sentence $4x - 7 \geq 3$ or $4x - 7 \leq -3$ as an absolute value sentence?

Remember What You Learned

5. Recall that $\lvert x\rvert$ tells you how many units the number x is from zero on the number line. Explain the meaning of $\lvert x\rvert < n$ and $\lvert x\rvert > n$ by using the idea of the distance from x to zero.

6-7 Lesson Reading Guide

Graphing Inequalities in Two Variables

Get Ready for the Lesson

Read the introduction to Lesson 6-7 in your textbook.

What do 3 and 4 represent in the terms $3x$ and $4y$?

Read the Lesson

1. Complete the chart to show which type of line is needed for each symbol.

Symbol	Type of Line	Boundary Part of Solution?
$<$		
$>$		
$\leq$		
$\geq$		

2. If a test point results in a false statement, what do you know about the graph?

3. If a test point results in a true statement, what do you know about the graph?

4. When can the origin *not* be used as a test point?

Remember What You Learned

5. The two-variable inequalities in this lesson can be solved for y in terms of x to get a sentence in slope-intercept form. It looks much like a slope-intercept equation, but it has an inequality symbol instead of an equals sign. For example, $4x + 2y \leq 5$ can be written as $y \leq -2x + \frac{5}{2}$. Explain how to graph an inequality once it is written in slope-intercept form. Use the idea that *greater* can mean *above* and *less* can mean *below*.

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6-8 Lesson Reading Guide

Graphing Systems of Inequalities

Get Ready for the Lesson

Read the introduction to Lesson 6-8 in your textbook.

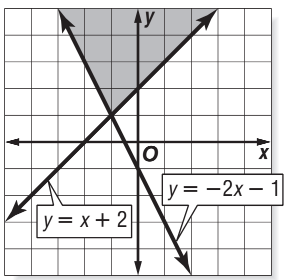
The green section on the graph represents a range of _________________

Calories a day and _________________ grams of fat per day.

Read the Lesson

Write the inequality symbols that you need to get a system whose graph looks like the one shown. Use <, ≤, >, or ≥.

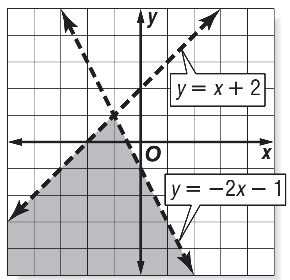
1.



y ______ $x + 2$

y ______ $-2x - 1$

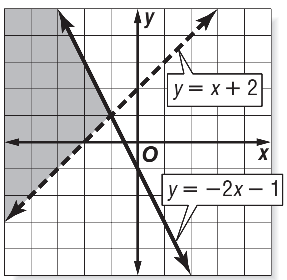
2.



y ______ $x + 2$

y ______ $-2x - 1$

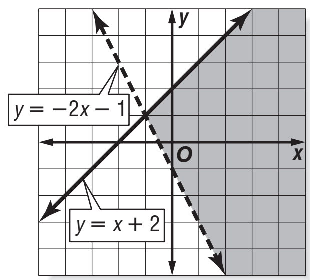
3.



y ______ $x + 2$

y ______ $-2x - 1$

4.



y ______ $x + 2$

y ______ $-2x - 1$

Remember What You Learned

5. Describe how you would explain the process of using a graph to solve a system of inequalities to a friend who missed Lesson 6-8.

7-1 Lesson Reading Guide

Multiplying Monomials

Get Ready for the Lesson

Read the introduction to Lesson 7-1 in your textbook.

Find two examples in the table to verify the statement that when speed is doubled, the braking distance is quadrupled. Write your examples in the table.

Speed (miles per hour)	Braking Distance (feet)	Speed Doubled (miles per hour)	Braking Distance Quadrupled (feet)

Read the Lesson

1. Describe the expression $3xy$ using the terms *monomial*, *constant*, *variable*, and *product*.

2. Complete the chart by choosing the property that can be used to simplify each expression. Then simplify the expression.

Expression	Property	Expression Simplified
$3^5 \cdot 3^2$	Product of Powers Power of a Power Power of a Product	
$(a^3)^4$	Product of Powers Power of a Power Power of a Product	
$(-4xy)^5$	Product of Powers Power of a Power Power of a Product	

Remember What You Learned

3. Write an example of each of the three properties of powers discussed in this lesson. Then, using the examples, explain how the property is used to simplify them.

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7-2 Lesson Reading Guide

Dividing Monomials

Get Ready for the Lesson

Read the introduction to Lesson 7-2 in your textbook.

- In the formula $c = \left(\frac{1}{10}\right)^{\text{pH}}$, identify the base and the exponent.
- How do you think c will change as the exponent increases?

Read the Lesson

1. Explain what the statement $\frac{a^m}{a^n} = a^{m-n}$ means.

2. To find c in the formula $c = \left(\frac{1}{10}\right)^{\text{pH}}$, you can find the power of the numerator, the power of the denominator, and divide. This is an example of what property?

3. Use the Quotient of Powers Property to explain why $3^0 = 1$.

4. Consider the expression 4^{-3}.

a. Explain why the expression 4^{-3} is not simplified.

b. Define the term reciprocal.

c. 4^{-3} is the reciprocal of what power of 4?

d. What is the simplified form of 4^{-3}?

Remember What You Learned

5. Describe how you would help a friend who needs to simplify the expression $\frac{4x^2}{2x^5}$.

7-3 Lesson Reading Guide

Polynomials

Get Ready for the Lesson

Read the introduction to Lesson 7-3 in your textbook.

- How many terms does $t^4 - 9t^3 + 24t^2 + 19t + 280$ have?

- What could you call a polynomial with just one term?

Read the Lesson

1. What is the meaning of the prefixes *mono*-, *bi*-, and *tri*-?

2. Write examples of words that begin with the prefixes *mono*-, *bi*-, and *tri*-.

3. Complete the table.

	monomial	binomial	trinomial	polynomial with more than three terms
Example	$3r^2t$	$2x^2 + 3x$	$5x^2 + 3x + 2$	$7s^2 + s^4 + 2s^3 - s + 5$
Number of Terms				

4. What is the degree of the monomial $3xy^2z$?

5. What is the degree of the polynomial $4x^4 + 2x^3y^3 + y^2 + 14$? Explain how you found your answer.

Remember What You Learned

6. Use a dictionary to find the meaning of the terms *ascending* and *descending*. Write their meanings and then describe a situation in your everyday life that relates to them.

7-4 Lesson Reading Guide

Adding and Subtracting Polynomials

Get Ready for the Lesson

Read the introduction to Lesson 7-4 in your textbook.

What operation would you use to find how much more the country music sales C were than the rap/hip-hop music sales R?

Read the Lesson

1. Use the example $(-3x^3 + 4x^2 + 5x + 1) + (-5x^3 - 2x^2 + 2x - 7)$.

a. Show what is meant by grouping like terms horizontally.

b. Show what is meant by aligning like terms vertically.

c. Choose one method, then add the polynomials.

2. How is subtracting a polynomial like subtracting a rational number?

3. An algebra student got the following exercise wrong on his homework. What was his error?

$(3x^5 - 3x^4 + 2x^3 - 4x^2 + 5) - (2x^5 - x^3 + 2x^2 - 4)$

$= [3x^5 + (-2x^5)] + (-3x^4) + [2x^3 + (-x^3)] + [-4x^2 + (-2x^2)] + (5 + 4)$

$= x^5 - 3x^4 + x^3 - 6x^2 + 9$

Remember What You Learned

4. How is adding and subtracting polynomials vertically like adding and subtracting decimals vertically?

Lesson 7-4

7-5 Lesson Reading Guide

Multiplying a Polynomial by a Monomial

Get Ready for the Lesson

Read the introduction to Lesson 7-5 in your textbook.

You may recall that the formula for the area of a rectangle is $A = \ell w$. In this rectangle, $\ell =$ ____________ and $w =$ ____________. How would you substitute these values in the area formula?

Read the Lesson

1. Refer to Lesson 7-5.

a. How is the Distributive Property used to multiply a polynomial by a monomial?

b. Use the Distributive Property to complete the following.

$2y^2(3y^2 + 2y - 7) = 2y^2(\_\_\_\_\_\_) + 2y^2(\_\_\_\_\_\_) - 2y^2(\_\_\_\_\_\_)$

$= \_\_\_\_\_\_ + \_\_\_\_\_\_ - \_\_\_\_\_\_$

$-3x^3(x^3 - 2x^2 + 3) = \_\_\_\_\_\_ - \_\_\_\_\_\_ + \_\_\_\_\_\_$

$= \_\_\_\_\_\_ + \_\_\_\_\_\_ - \_\_\_\_\_\_$

2. What is the difference between simplifying an expression and solving an equation?

Remember What You Learned

3. Use the equation $2x(x - 5) + 3x(x + 3) = 5x(x + 7) - 9$ to show how you would explain the process of solving equations with polynomial expressions to another algebra student.

7-6 Lesson Reading Guide

Multiplying Polynomials

Get Ready for the Lesson

Read the introduction to Lesson 7-6 in your textbook.

In your own words, explain how the distributive property is used twice to multiply two-digit numbers.

Read the Lesson

1. How is multiplying binomials similar to multiplying two-digit numbers?

2. Complete the table using the FOIL method.

		Product of First Terms	+	Product of Outer Terms	+	Product of Inner Terms	+	Product of Last Terms
$(x + 5)(x - 3)$	=		+		+		+	
	=		+		+		+	
	=		+		−			
$(3y + 6)(y - 2)$	=		+		+		+	
	=		+		+		+	
	=		−					

Remember What You Learned

3. Think of a method for remembering all the product combinations used in the FOIL method for multiplying two binomials. Describe your method using words or a diagram.

7-7 Lesson Reading Guide

Special Products

Get Ready for the Lesson

Read the introduction to Lesson 7-7 in your textook.

What is a meant by the term *trinomial product*?

Read the Lesson

1. Refer to the Key Concepts boxes on pages 398, 399, and 400.

a. When multiplying two binomials, there are three special products. What are the three special products that may result when multiplying two binomials?

b. Explain what is meant by the name of each special product.

c. Use the examples in the Key Concepts boxes to complete the table.

	Symbols	Product	Example	Product
Square of a Sum				
Square of a Difference				
Product of a Sum and a Difference				

2. What is another phrase that describes the product of the sum and difference of two terms?

Remember What You Learned

3. Explain how FOIL can help you remember how many terms are in the special products studied in this lesson.

8-1 Lesson Reading Guide

Monomials and Factoring

Get Ready for the Lesson

Read the introduction to Lesson 8-1 in your textbook.

What would the third signal in the series be?

Read the Lesson

1. Every whole number greater than 1 is either composite or ____________.

2. Complete each statement.

a. In the prime factorization of a whole number, each factor is a ____________ number.

b. In the prime factorization of a negative integer, all the factors are prime except the factor ____________.

3. Explain why the monomial $5x^2y$ is *not* in factored form.

4. Explain the steps used below to find the greatest common factor (GCF) of 84 and 120.

$84 = 2 \cdot 2 \cdot 3 \cdot 7$

$120 = 2 \cdot 2 \cdot 2 \cdot 3 \cdot 5$

Common prime factors: 2, 2, 3

$2 \cdot 2 \cdot 3 = 12$

Remember What You Learned

5. How can the two words that make up the term *prime factorization* help you remember what the term means?

NAME ____ DATE______________ PERIOD _____

8-2 Lesson Reading Guide

Factoring Using the Distributive Property

Get Ready for the Lesson

Read the introduction to Lesson 8-2 in your textbook.

In the formula $h = 151t - 16t^2$, what does the number 151 represent?

Read the Lesson

1. Factoring a polynomial means to find its completely factored form.

a. The expression $x(6x - 9)$ is a factored form of the polynomial $6x^2 - 9x$. Why is this *not* its completely factored form?

b. Provide an example of a completely factored polynomial.

c. Provide an example of a polynomial that is not completely factored.

2. The polynomial $5ab + 5b^2 + 3a + 6b$ can be rewritten as $5b(a + b) + 3(a + 2b)$. Does this indicate that the original polynomial can be factored by grouping? Explain.

3. The polynomial $3x^2 - 3xy + 2x - 2y$ can be rewritten as $3x(x - y) + 2(x - y)$. Does this indicate that the original polynomial can be factored by grouping? Explain.

Remember What You Learned

4. How would you explain to a classmate when it is possible to use the Zero Product Property to solve an equation?

8-3 Lesson Reading Guide

Factoring Trinomials: $x^2 + bx + c$

Get Ready for the Lesson

Read the introduction to Lesson 8-3 in your textbook.

- Why do you need to find two numbers whose *product* is 54?

- Why is the *sum* of these two numbers half the perimeter or 15?

Read the Lesson

Tell what sum and product you want m and n to have to use the pattern $(x + m)(x + n)$ to factor the given trinomial.

1. $x^2 + 10x + 24$ sum: _____________ product: _____________

2. $x^2 - 12x + 20$ sum: _____________ product: _____________

3. $x^2 - 4x - 21$ sum: _____________ product: _____________

4. $x^2 + 6x - 16$ sum: _____________ product: _____________

5. To factor $x^2 - 18x + 32$, you can look for numbers with a product of 32 and a sum of -18. Explain why the numbers in the pair you are looking for must both be negative.

Remember What You Learned

6. If you are using the pattern $(x + m)(x + n)$ to factor a trinomial of the form $x^2 + bx + c$, how can you use your knowledge of multiplying integers to help you remember whether m and n are positive or negative factors?

8-4 Lesson Reading Guide

Factoring Trinomials: $ax^2 + bx + c$

Get Ready for the Lesson

Read the introduction to Lesson 8-4 in your textbook.

Why does $mn = ac$ in the table given?

Read the Lesson

1. Suppose you want to factor the trinomial $3x^2 + 14x + 8$.

a. What is the first step?

b. What is the second step?

c. Provide an explanation for the next two steps.

$(3x^2 + 2x) + (12x + 8)$

$x(3x + 2) + 4(3x + 2)$

d. Use the Distributive Property to rewrite the last expression in part c. You get

(_________ + _________)$(3x + 2)$.

2. Explain how you know that the trinomial $2x^2 - 7x + 4$ is a prime polynomial.

Remember What You Learned

3. What are steps you could use to remember how to find the factors of a trinomial written in the form of $ax^2 + bx + c$?

NAME ____ DATE______________ PERIOD _____

8-5 Lesson Reading Guide

Factoring Differences of Squares

Get Ready for the Lesson

Read the introduction to Lesson 8-5 in your textbook.

Suppose a player can jump 2 feet. Can you use the pattern for the difference of squares to solve the equation $4t^2 - 2 = 0$? Explain.

Read the Lesson

1. Explain why each binomial is a difference of squares.

a. $4x^2 - 25$

b. $49a^2 - 64b^2$

2. Sometimes it is necessary to apply more than one technique when factoring, or to apply the same technique more than once.

a. What should you look for first when you are factoring a binomial?

b. Explain what is done in each step to factor $4x^4 - 64$.

$4x^4 - 64$

$= 4(x^4 - 16)$

$= 4[(x^2)^2 - 4^2]$

$= 4(x^2 + 4)(x^2 - 4)$

$= 4(x^2 + 4)(x^2 - 2^2)$

$= 4(x^2 + 4)(x + 2)(x - 2)$

3. Suppose you are solving the equation $16x^2 - 9 = 0$ and rewrite it as $(4x + 3)(4x - 3) = 0$. What would be your next steps in solving the equation?

Remember What You Learned

4. How can you remember whether a binomial can be factored as a difference of squares?

NAME ____ DATE______________ PERIOD _____

8-6 Lesson Reading Guide

Perfect Squares and Factoring

Get Ready for the Lesson

Read the introduction to Lesson 8-6 in your textbook.

- On the left side of the equation $(8 + 2x)^2 = 144$, the number 8 in the expression $(8 + 2x)^2$ represents ___________________________________ and $2x$ represents twice ___________________________________.
- On the right side of the equation, the number 144 represents ___________________________________ in the center of the pavilion, plus the _________________ of the bricks surrounding the center mascot.

Read the Lesson

1. Three conditions must be met if a trinomial can be factored as a ___________________________________. Complete the following sentences.

The first term of the trinomial $9x^2 - 6x + 1$ __________ (is/is not) a perfect square.

The last term of the trinomial, __________ (is/is not) a perfect square.

The _________________ is equal to $2(3x)(1)$.

The trinomial $9x^2 - 6x + 1$ __________ (is/is not) a _________________ trinomial.

2. Match each polynomial from the first column with a factoring technique in the second column. Some of the techniques may be used more than once. If none of the techniques can be used to factor the polynomial, write *none*.

a. $9x^2 - 64$	**i.** factor as $x^2 + bx + c$
b. $9x^2 + 12x + 4$	**ii.** factor as $ax^2 + bx + c$
c. $x^2 - 5x + 6$	**iii.** difference of squares
d. $4x^2 + 13x + 9$	**iv.** factoring by grouping
e. $9xy + 3y + 6x + 2$	**v.** perfect square trinomial
f. $x^2 - 4x + 4$	**vi.** factor out the GCF
g. $2x^2 - 16$	

Remember What You Learned

3. Sometimes it is easier to remember a set of instructions if you can state them in a short sentence or phrase. Summarize the conditions that must be met if a trinomial can be factored as a perfect square trinomial.

9-1 Lesson Reading Guide

Graphing Quadratic Functions

Get Ready for the Lesson

Read the introduction to Lesson 9-1 in your textbook.

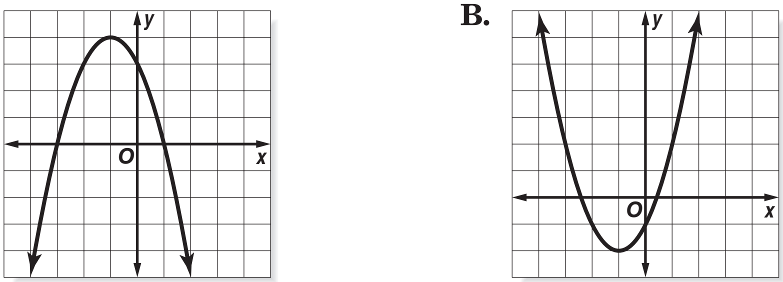
According to the graph, at what height does the rocket explode and in how many seconds after being launched?

Read the Lesson

1. The standard form for a ________________ function is $y = ax^2 + bx + c$. For the function $y = 2x^2 - 5x + 3$, the value of a is ________, the value of b is ________, and the value of c is ________.

2. The graphs of two quadratic functions are shown below. Complete each statement about the graphs.

A. **B.**



a. Each graph is a curve called a ________________.

b. The highest point of graph A is located at ________________. This point is the ________________ (maximum/minimum) point of the graph.

c. The lowest point of graph B is located at ________________. This point is the ________________ (maximum/minimum) point of the graph.

3. The maximum or minimum point of a parabola is called the ________________ of the parabola.

4. If you fold a parabola along a line to get two halves that match exactly, the line where you fold the parabola is the ________________________ of the parabola. This line goes through the ________________ of the parabola.

5. For a quadratic function $y = ax^2 + bx + c$, the parabola opens upward if a ________ 0. It opens downward if a ________ 0.

Remember What You Learned

6. Look up the word *vertex* in a dictionary. You will find that it comes from the Latin word *vertere*, which means to turn. How can you use the idea of "to turn" to remember what the vertex of a parabola is?

NAME ______________________________ DATE______________ PERIOD _____

9-2 Lesson Reading Guide

Solving Quadratic Equations by Graphing

Get Ready for the Lesson

Read the introduction to Lesson 9-2 in your textbook.

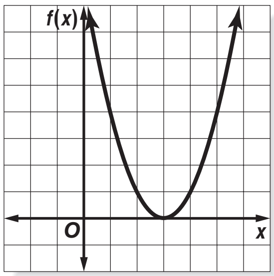
If one of the x-intercepts represents the location where the ball will hit the ground, what does the other x-intercept represent?

Read the Lesson

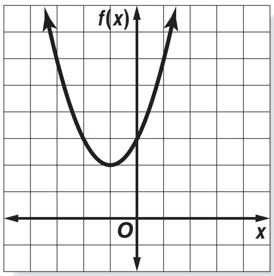
1. The x-intercepts of the graph of a quadratic function are the x-coordinates of the points where the graph of the function intersects the x-axis. At those points, the y-coordinates are equal to __________. This explains why the x-intercepts are called __________ of the quadratic function.

2. The graphs of three functions are shown below. Use the graphs to provide the requested information about the related quadratic equations.

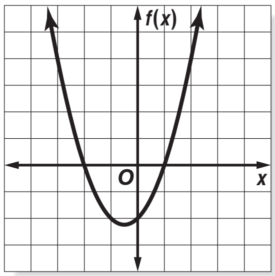
A. $f(x) = x^2 - 6x + 9$



B. $f(x) = x^2 + 2x + 3$



C. $f(x) = x^2 + x - 2$



a. For Graph A, the related quadratic equation is ________________________.

How many real solutions are there?

Name any solutions.

b. For Graph B, the related quadratic equation is ________________________.

How many real solutions are there?

Name any solutions.

c. For Graph C, the related quadratic equation is ________________________.

How many real solutions are there?

Name any solutions.

Remember What You Learned

3. Describe how you can remember that the word *zero* is used when you are talking about functions, but the word *root* is used when you are talking about equations.

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9-3 Lesson Reading Guide

Solving Quadratic Equations by Completing the Square

Get Ready for the Lesson

Read the introduction to Lesson 9-3 in your textbook.

To solve the problem, how many "units" would Al-Khwarizmi have added to each side of the equation?

Read the Lesson

1. Draw a line under each quadratic equation that you could solve by taking the square root of each side.

$x^2 + 6x + 9 = 100$	$x^2 - 14x + 40 = 25$	$x^2 - 16x + 64 = 26$
$x^2 - 20x + 80 = 16$	$x^2 + 10x + 36 = 49$	$x^2 - 12x + 36 = 6$

2. How can you tell whether it is possible to solve a quadratic equation by taking the square root of each side?

3. Explain how to find what number is needed for the ■ in order to make $x^2 - 20x +$ ■ a perfect square.

4. To solve $3x^2 - 6x = 54$ by completing the square, why does it help first to divide both sides by 3?

Remember What You Learned

5. The method of completing the square might be easier to remember if you can connect it to what you know about perfect square trinomials. How is completing the square related to the method you use to determine whether a trinomial is a perfect square trinomial?

Lesson 9-3

9-4 Lesson Reading Guide

Solving Quadratic Equations by Using the Quadratic Formula

Get Ready for the Lesson

Read the introduction to Lesson 9-4 in your textbook.

Your teacher asks you to predict when 17% of the population will consist of people born outside the United States. What equation should you use to make the prediction?

Read the Lesson

1. Suppose you want to solve $12x^2 + 7x = 15$ using the Quadratic Formula.

a. What should you do first?

b. What are the values you need to substitute for a, b, and c in the Quadratic Formula?

c. Apply the Quadratic Formula using the above values, but do not solve the equation.

2. a. You can use the discriminant to determine the number of real roots for a quadratic equation. What is the discriminant?

b. Complete the statements below so that each statement is true.

When the value of the discriminant is _________________, there is one real root.

When the value of the discriminant is _________________, there are two real roots.

When the value of the discriminant is _________________, there are no real roots.

Remember What You Learned

3. To help remember the methods for solving a quadratic equation, explain how you would choose the best method for solving a quadratic equation $ax^2 + bx + c = 0$.

NAME ______________________________ DATE__________ PERIOD _____

9-5 Lesson Reading Guide

Exponential Functions

Get Ready for the Lesson

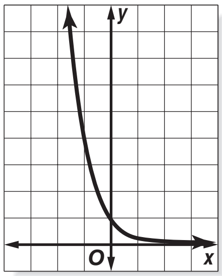
Read the introduction to Lesson 9-5 in your textbook.

If Mr. Warther had carved a ninth layer of pliers, how many pliers would he have carved?

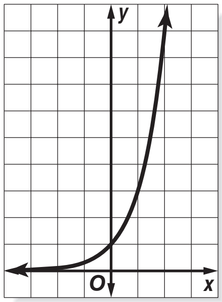
Read the Lesson

1. The graphs of two exponential functions of the form $y = a^x$ are shown below.

A.



B.



a. In Graph A, the value of a is greater than ________ and less than ________. The y values decrease as the x values ________________.

b. In Graph B, the value of a is greater than ________. The y values ________________ as the x values increase.

2. a. When you look for a pattern of exponential behavior in a set of data, what is the pattern you are looking for?

b. If a set of data has a negative common factor, does it display exponential behavior?

Remember What You Learned

3. What comparisons can you make between the quadratic function $y = x^2$ and the exponential function $y = 2^x$ to help remember the differences between quadratic and exponential functions?

9-6 Lesson Reading Guide

Growth and Decay

Get Ready for the Lesson

Read the introduction to Lesson 9-6 in your textbook.

Suppose you want to predict the restaurant industry sales in the year 2009. What number should be substituted for t?

Read the Lesson

Match an equation to each situation, and then indicate whether the situation is an example of exponential growth or decay.

1. A coin had a value of \$1.17 in 1995. Its value has been increasing at a rate of 9% per year.

A. $y = 1.17(1.09)^t$ **B.** $y = 1.17(0.91)^t$

2. A business owner has just paid \$6000 for a computer. It depreciates at a rate of 22% per year. How much will it be worth in 5 years?

A. $A = 6000(1.22)^5$ **B.** $A = 6000(0.78)^5$

3. A city had a population of 14,358 residents in 2002. Since then, its population has been decreasing at a rate of about 5.5% per year.

A. $A = 14{,}358(1.055)^t$ **B.** $A = 14{,}358(0.945)^t$

4. Gina deposited \$1500 in an account that pays 4% interest compounded quarterly. What will be the worth of the account in 2 years if she makes no deposits and no withdrawals?

A. $A = 1500(1.02)^2$ **B.** $A = 1500(1.01)^8$

Remember What You Learned

5. How can you use what you know about raising a number to the 0 power to help you remember what C represents in the exponential growth equation $A = C(1 + r)^t$ and the exponential decay equation $A = C(1 - r)^t$?

NAME ____ DATE______________ PERIOD _____

10-1 Lesson Reading Guide

Simplifying Radical Expressions

Get Ready for the Lesson

Read the introduction to Lesson 10-1 in your textbook.

Suppose you want to calculate the escape velocity for a spacecraft taking off from the planet Mars. When you substitute numbers in the formula, which number is sure to be the same as in the calculation for the escape velocity for a spacecraft taking off from Earth?

Read the Lesson

Lesson 10-1

1. a. How can you tell that the radical expression $\sqrt{28x^2y^4}$ is not in simplest form?

b. To simplify $\sqrt{28x^2y^4}$, you first find the ________________________________ of $28x^2y^4$.

You then apply the ____. In this case,

$\sqrt{4 \cdot 7 \cdot x^2 \cdot y^4}$ is equal to the product __________________________. You can simplify again to get a final answer of $2|x|y^2\sqrt{7}$.

2. Why is it correct to write $\sqrt{y^4} = y^2$, with no absolute value sign, but not correct to write $\sqrt{x^2} = x$?

3. What method would you use to simplify $\frac{\sqrt{12t}}{\sqrt{15}}$?

4. What should you do to write the conjugate of a binomial of the form $a\sqrt{b} + c\sqrt{d}$? To write the conjugate of a binomial of the form $a\sqrt{b} - c\sqrt{d}$?

Remember What You Learned

5. What should you remember to check for when you want to determine if a radical expression is in simplest form?

10-2 Lesson Reading Guide

Operations with Radical Expressions

Get Ready for the Lesson

Read the introduction to Lesson 10-2 in your textbook.

Suppose you substitute the heights of the Sears Tower and the Empire State Building into the formula to find how far you can see from atop each building. What operation should you then use to determine how much farther you can see from the Sears Tower than from the Empire State Building?

Read the Lesson

1. Indicate whether the following expressions are in simplest form. Explain your answer.

a. $6\sqrt{3} - \sqrt{12}$

b. $12\sqrt{6} + 7\sqrt{10}$

2. Below the words **F**irst terms, **O**uter terms, **I**nner terms, and **L**ast terms, write the products you would use to simplify the expression $(2\sqrt{15} + 3\sqrt{15})(6\sqrt{3} - 5\sqrt{2})$.

First terms		**O**uter terms		**I**nner terms		**L**ast terms
________________	+	________________	+	________________	+	________________

Remember What You Learned

3. How can you use what you know about adding and subtracting monomials to help you remember how to add and subtract radical expressions?

10-3 Lesson Reading Guide

Radical Equations

Get Ready for the Lesson

Read the introduction to Lesson 10-3 in your textbook.

How can you isolate $\sqrt{h}$ on one side of the equation?

Read the Lesson

1. To solve a radical equation, you first isolate the radical on one side of the equation. Why do you then square each side of the equation?

2. a. Provide the reason for each step in the solution of the given radical equation.

$\sqrt{5x - 1} - 4 = x - 3$	Original equation
$\sqrt{5x - 1} = x + 1$	______________________
$\left(\sqrt{5x - 1}\right)^2 = (x + 1)^2$	______________________
$5x - 1 = x^2 + 2x + 1$	______________________
$0 = x^2 - 3x + 2$	______________________
$0 = (x - 1)(x - 2)$	______________________
$x - 1 = 0$ or $x - 2 = 0$	______________________
$x = 1$ $\quad$ $x = 2$	______________________

b. To be sure that 1 and 2 are the correct solutions, into which equation should you substitute to check?

3. a. How do you determine whether an equation has an extraneous solution?

b. Is it necessary to check all solutions to eliminate extraneous solutions? Explain.

Remember What You Learned

4. How can you use the letters ISC to remember the three steps in solving a radical equation?

10-4 Lesson Reading Guide

The Pythagorean Theorem

Get Ready for the Lesson

Read the introduction to Lesson 10-4 in your textbook.

The diagram in the introduction shows a right triangle and part of the roller coaster. Which side of the right triangle has a length approximately equal to the length of the first hill of the roller coaster?

Read the Lesson

Complete each sentence.

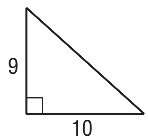
1. The words *leg* and *hypotenuse* refer to the sides of a ________________ triangle.

2. In a right triangle, each of the two sides that form the right angle is a ________________ of the right triangle.

3. The longest side of a right triangle is called the ________________ of the right triangle.

Write an equation that you could solve to find the missing side length of each right triangle.

4.



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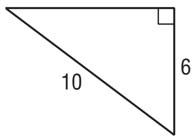
5.



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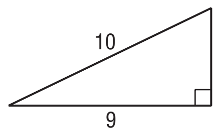
6.



____

7. Suppose you are given three positive numbers. Explain how you can decide whether these numbers are the lengths of the sides of a right triangle.

Remember What You Learned

8. Think of a word or phrase that you can associate with the Pythagorean Theorem to help you remember the equation $c^2 = a^2 + b^2$.

10-5 Lesson Reading Guide

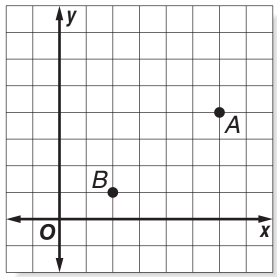
The Distance Formula

Get Ready for the Lesson

Read the introduction to Lesson 10-5 in your textbook.

What are the lengths of *PO* and *OL*?

Read the Lesson



1. Suppose you want to use the Distance Formula to find the distance between (6, 4) and (2, 1). Use $(x_1, y_1) = (6, 4)$ and $(x_2, y_2) = (2, 1)$. Complete the equations by writing the correct numbers in the blanks.

a. $x_1 =$ ____ $y_1 =$ ____ $x_2 =$ ____ $y_2 =$ ____

b. $d = \sqrt{(\_\_\_\_ - \_\_\_\_)^2 + (\_\_\_\_ - \_\_\_\_)^2}$

2. Suppose you want to use the Distance Formula to find the distance between (3, 7) and (9, −2). Use $(x_1, y_1) = (3, 7)$ and $(x_2, y_2) = (9, -2)$. Complete the equations by writing the correct numbers in the blanks.

a. $x_1 =$ ____ $y_1 =$ ____ $x_2 =$ ____ $y_2 =$ ____

b. $d = \sqrt{(\_\_\_\_ - \_\_\_\_)^2 + (\_\_\_\_ - \_\_\_\_)^2}$

3. A classmate is using the Distance Formula to find the distance between two points. She has done everything correctly so far, and her equation is $d = \sqrt{(-2 - 5)^2 + (7 - 11)^2}$. This equation will give her the distance between what two points?

Remember What You Learned

4. Sometimes it is easier to remember a formula if you can state it in words. How can you state the Distance Formula in easy-to-remember words?

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10-6 Lesson Reading Guide

Similar Triangles

Get Ready for the Lesson

Read the introduction to Lesson 10-6 in your textbook.

How would you describe the shapes and sizes of the figures in the diagram?

Read the Lesson

Complete each sentence.

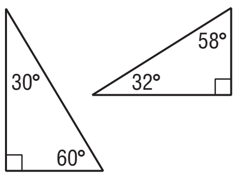
1. In similar triangles, the angles of the two triangles can be matched so that ____________________ angles have equal ____________________.

2. If the angles of one triangle do not have the same measures as the angles of a second triangle, then the two angles are not ____________________.

3. If two triangles have the same size and shape, then the measures of the corresponding sides are ____________________.

Determine whether each pair of triangles is similar. Explain how you know that your answer is correct.

4.



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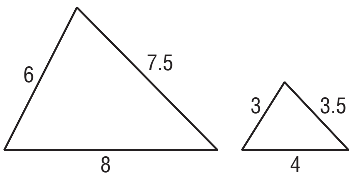

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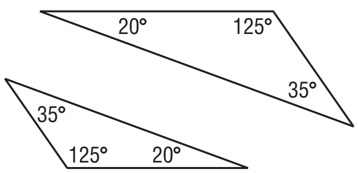

Remember What You Learned

7. How can you use the idea that the corresponding sides of similar triangles are proportional to help you remember how to find the unknown lengths of the sides of similar triangles?

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11-1 Lesson Reading Guide

Inverse Variation

Lesson 11-1

Get Ready for the Lesson

Read the introduction to Lesson 11-1 in your textbook.

Given the data in the table, a bicyclist will pedal

________________ (faster/slower) when shifting to a lower gear and

________________ (faster/slower) when shifting to a higher gear.

Read the Lesson

1. Write *direct variation*, *inverse variation*, or *neither* to describe the relationship between x and y described by each equation.

a. $y = 3x$ **b.** $xy = 5$ **c.** $y = -8x$

d. $y = \frac{2}{x}$ **e.** $x = \frac{10}{y}$ **f.** $y = 7x - 1$

2. Why does the equation $xy = 0$ *not* describe an inverse variation?

3. Suppose you want to graph an inverse variation in which $y = 12$ when $x = 9$. What two things should you do before you sketch the graph?

4. For each problem, assume that y varies inversely as x. Use the Product Rule to write an equation you could use to solve the problem. Then write a proportion you could use to solve the problem.

	Problem	Product Rule	Proportion
a.	If $y = 8$ when $x = 12$, find y when $x = 4$.		
b.	If $x = 50$ when $y = 6$, find x when $y = 30$.		

Remember What You Learned

5. To remember how to set up a proportion to solve a problem involving inverse variation, write a sentence describing the form the proportion should have.

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11-2 Lesson Reading Guide

Rational Expressions

Get Ready for the Lesson

Read the introduction to Lesson 11-2 in your textbook.

What happens to the image on the screen if the distance between the projector and the screen increases?

Read the Lesson

1. Write *yes* or *no* to tell whether each expression is or is not a rational expression. If an expression is not a rational expression, explain why.

a. $\frac{x - 2}{-6x + 7}$ **b.** $\frac{n^2 - 15}{2n^3 + n - 4}$ **c.** $\frac{\sqrt{3x - 4}}{5x}$

Complete each sentence.

2. An excluded value for a rational expression that contains the variable _________________ is a value of x that makes the _________________ of the rational expression equal to _________________.

3. To simplify a rational expression, you divide the numerator and denominator of the expression by their _________________.

4. If you simplify $\frac{7x - 14}{x^2 - 5x + 6}$, you will find that $\frac{7x - 14}{x^2 - 5x + 6} = \frac{7}{x - 3}$. Write the equation you should solve to find the excluded values. Do not solve the equation.

5. Tell whether each statement is *true* or *false* for every rational expression and its simplified form.

a. If a number n is an excluded value for the simplified form of a rational expression, then it must also be an excluded value for the original rational expression.

b. If a number n is an excluded value for a rational expression, then it must also be an excluded value for the simplified form of the expression.

Remember What You Learned

6. Explain how you can use what you know about simplifying fractions for rational numbers to remember how to simplify rational expressions.

11-3 Lesson Reading Guide

Multiplying Rational Expressions

Get Ready for the Lesson

Read the introduction to Lesson 11-3 in your textbook.

- Why are units of measure crossed out in the expression?
- What is the expression after you multiply the numerators and multiply the denominators?

Read the Lesson

1. Complete the sentence. The product of two rational expressions can always be found by multiplying the numerators and multiplying the ________________.

2. When you multiply rational expressions, why do you eliminate common factors from the expression(s) above and below the fraction bar(s)?

3. Complete the sentence. If the numerators or denominators of two rational expressions involve quadratic expressions with two or three terms, try to ________________ these expressions before you multiply the rational expressions.

4. A student thinks that Example 2b shows that you can multiply two rational expressions and get an answer that is not a rational expression. Do you agree? Explain.

Remember What You Learned

5. Suppose that a friend was absent when the class worked on this lesson. Tell how you can explain to your friend the procedure for multiplying rational expressions.

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11-4 Lesson Reading Guide

Dividing Rational Expressions

Get Ready for the Lesson

Read the introduction to Lesson 11-4 in your textbook.

Write an equation that you could use to determine the number of aluminum cans, in billions, produced each year.

Read the Lesson

1. Why is it important to know the reciprocal of the divisor when you divide two rational expressions?

2. State the reciprocal of the divisor in each of the following.

a. $\frac{3b + 15}{b + 1} \div (b - 2)$ **b.** $\frac{2c^2}{d} \div \frac{c}{3d}$

3. Supply the reason for each step below.

$\frac{y + 1}{y^2 + 5y + 6} \div \frac{1}{y + 3}$ Original expression

$= \frac{y + 1}{y^2 + 5y + 6} \cdot \frac{y + 3}{1}$ ______________________________

$= \frac{y + 1}{(y + 2)(y + 3)} \cdot \frac{y + 3}{1}$ ______________________________

$= \frac{y + 1}{(y + 2)\cancel{(y + 3)}} \cdot \frac{\cancel{y + 3}}{1}$ ______________________________

$= \frac{y + 1}{y + 2}$ ______________________________

Remember What You Learned

4. One way to remember something is to see how it is similar to something you already know. How is dividing rational expressions similar to dividing rational numbers that are in fraction form?

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11-5 Lesson Reading Guide

Dividing Polynomials

Get Ready for the Lesson

Read the introduction to Lesson 11-5 in your textbook.

- One way to find the number of flags is to ________________ the terms in the numerator, and then divide by the ________________.
- Another way to find the number of flags is to ________________ each term of the numerator by the ________________ and then ________________.

Read the Lesson

Complete each sentence.

1. To divide a polynomial by a monomial, you can divide each ________________ of the polynomial by the monomial.

2. You can use factoring to divide a polynomial by a binomial if a ________________ of the polynomial is equal to the binomial divisor.

3. If you cannot see a way to factor a polynomial, then you can divide it by a binomial by using ________________.

4. In Example 4, the polynomial that is being divided cannot be factored. In such cases, the quotient can be written as the sum of a polynomial and a fraction whose numerator is a number and whose denominator is equal to the ____________________.

5. Tell whether the following statement is true or false. If you say that it is false, give an example that supports your answer.

To divide a polynomial by a binomial of the form $x - a$, the polynomial must have at least two terms.

6. If you are dividing a polynomial by a binomial, what number should you use to represent a missing term of the polynomial?

Remember What You Learned

7. If you want to remember one method that you can always use to divide a polynomial by a binomial, which method should you select?

11-6 Lesson Reading Guide

Rational Expressions with Like Denominators

Get Ready for the Lesson

Read the introduction to Lesson 11-6 in your textbook.

Write a subtraction expression that you can evaluate to find what percent of the families surveyed eat takeout once a week or more.

Read the Lesson

1. To add or subtract rational expressions with like denominators, add or subtract the ________________________ and then write the sum or difference over the ________________________.

2. For each addition or subtraction problem, write the needed expression in each box on the right side of the equation.

a. $\frac{5n}{7} + \frac{8}{7} = \frac{5n + \boxed{}}{7}$

b. $\frac{7x}{x-1} + \frac{x+3}{x-1} = \frac{\boxed{} + (x+3)}{\boxed{}}$

c. $\frac{3}{2m+5} - \frac{6m+1}{2m+5} = \frac{3 - (\boxed{})}{\boxed{}}$

d. $\frac{d-c}{c+2d} - \frac{c-d}{c+2d} = \frac{\boxed{} - (c-d)}{c+2d}$

e. $\frac{7}{3x-4} - \frac{5}{4-3x} = \frac{7 + \boxed{}}{3x-4}$

f. $\frac{8}{6x-1} + \frac{9}{1-6x} = \frac{8 + (\boxed{})}{6x-1}$

Remember What You Learned

3. How can you use what you know about addition and subtraction of rational numbers that have like denominators to remember how to add and subtract rational expressions that have like denominators?

NAME ____ DATE______________ PERIOD _____

11-7 Lesson Reading Guide

Rational Expressions with Unlike Denominators

Get Ready for the Lesson

Read the introduction to Lesson 11-7 in your textbook.

- How can you find the years after 2004 when an election for senator will occur?
- How can you find the years after 2004 when an election for President of the United States will occur?

Read the Lesson

1. Answer each question about the monomials $49k^2n^3$ and $21kn^5$.

a. What prime numbers are factors of these monomials?

b. How many times are these prime factors used in each monomial?

c. How many times should you use 3 as a factor in the LCM of the two monomials? How many times should you use 7 as a factor in the LCM?

d. How many times should you use k as a factor in the LCM? How many times should you use n as a factor in the LCM?

2. How is the LCD for two rational expressions related to the LCM of the denominators?

3. How does the LCD of two rational expressions help you add or subtract the expressions?

Remember What You Learned

4. Making a short list of the steps in a procedure can help you remember the procedure. Make a short list of the main steps you can use to add or subtract rational expressions with unlike denominators.

11-8 Lesson Reading Guide

Mixed Expressions and Complex Fractions

Get Ready for the Lesson

Read the introduction to Lesson 11-8 in your textbook.

What is another way to write $\frac{2\frac{1}{2}}{1\frac{1}{2}}$?

Read the Lesson

1. Tell whether each expression is a mixed expression or complex fraction. Write M for mixed expression and C for complex fraction.

a. $7x + \frac{x + 2}{x - 5}$ **b.** $\frac{5 + \frac{2}{s - 1}}{s^2}$ **c.** $\frac{y + 12\frac{1}{4}}{\frac{3}{4}}$ **d.** $(b - 6) + \frac{b + 3}{b + 2}$

2. Complete each statement about mixed expressions and complex fractions.

a. A mixed expression is the sum of a monomial and a __________________________.

To change it to a rational expression, find the _________________, rename the monomial as a rational expression using that denominator, and add.

b. A complex fraction is a fraction that has one or more _________________ in its numerator or denominator.

3. Complete each statement.

a. One method of simplifying a complex fraction is first to rewrite it as a

_________________ expression. Then _________________ by the _________________ of the divisor.

b. Another method is to express a fraction of the form $\frac{\frac{a}{b}}{\frac{c}{d}}$ as ______, and then

_________________.

Remember What You Learned

4. Describe an easy way to remember what a mixed expression is.

Lesson 11-8

11-9 Lesson Reading Guide

Solving Rational Equations

Get Ready for the Lesson

Read the introduction to Lesson 11-9 in your textbook.

What is some information that would be important in establishing a schedule for a subway system?

Read the Lesson

1. Is $\frac{\sqrt{x-3}}{4} = \frac{3}{x}$ a rational equation? Explain.

2. How can you tell by looking at a rational equation whether you can solve it by using cross products?

3. How does multiplying both sides of a rational equation by the LCD help you solve the equation?

4. For Example 4 in your textbook, look at the first equation of the Solve stage.

a. What does the expression $\frac{1}{2}\left(\frac{4}{3}\right)$ represent in this situation?

b. What does the expression $\frac{1}{t}\left(\frac{4}{3}\right)$ represent?

c. What does the number 1 on the right side represent?

5. When you solve a rational equation, in which equation should you substitute to eliminate possible extraneous solutions?

Remember What You Learned

6. Think of a word that can help you remember that multiplying by the LCD is one method you can use to solve a rational equation.

12-1 Lesson Reading Guide

Sampling and Bias

Get Ready for the Lesson

Read the introduction to Lesson 12-1 in your textbook.

From what group are the CDs picked at random and then checked for defects?

Read the Lesson

Suppose the principal at a school wants to use Saturdays as make-up days when school is closed for inclement weather. The principal selects and then polls a group of students to see if the student body supports the idea. Complete the sentences.

1. The student body is the _________________ from which a _________________ of students is selected to be polled. If all the students are polled, it is called a _________________.

2. If all students are requested to enter school through the administration building and every twenty-fifth student is selected to be polled, then the sample is a ___________________________ sample. If only those students who are in the four classrooms closest to the principal's office are selected for the poll, then the sample is a ___________________________ sample. If the principal announces a poll and then interviews the students who sign up to be interviewed, then the sample is a ___________________________ sample.

3. Numbers can be assigned to all students and a computer can select 50 of the numbers at random. The students assigned those numbers would be polled. This would be a ___________________________ sample. If students are first divided according to grade and then chosen at random from each group, then the sample is a ___________________________ sample.

4. All _________________ samples are unbiased since they are selected without preference for one unit of the population over another. A _________________ sample favors one part or parts of the population over other parts.

Remember What You Learned

5. To remember what a stratified random sample is, look up the word *stratified* in a dictionary. What everyday meaning do you find that seems closest to the mathematical meaning presented in this lesson?

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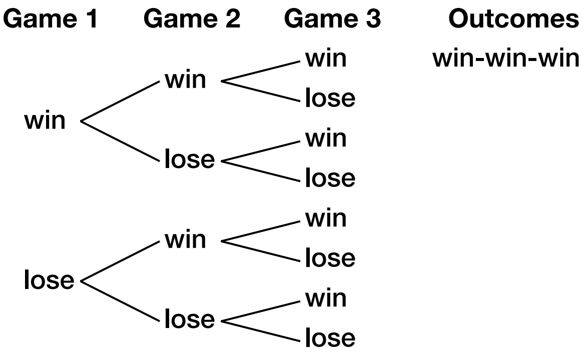
12-2 Lesson Reading Guide

Counting Outcomes

Get Ready for the Lesson

Read the introduction to Lesson 12-2 in your textbook. Then complete the diagram.



Read the Lesson

Use the tree diagram above for Exercises 1–4.

1. What is the sample space?

2. Name two different outcomes.

3. Three different outcomes result in a win/loss record of 2-1. What are they?

4. Use the Fundamental Counting Principle to complete the chart.

	Game 1		Game 2		Game 3		Number of Outcomes
Number of Choices		·		·		=	

Remember What You Learned

5. Suppose you are training the new disc jockey for a school radio station. He has chosen 10 selections to play from a new CD. How could you use factorials to explain to him the number of different ways the selections could be played?

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12-3 Lesson Reading Guide

Permutations and Combinations

Get Ready for the Lesson

Read the introduction to Lesson 12-3 in your textbook.

What is meant by the term *combination*?

Read the Lesson

Complete the chart.

	Situation	Permutation or Combination?	Explain Your Choice
1.	3 of 7 students are chosen to go to a job fair		
2.	arrangement of student work for the school art show		
3.	4-digit student I.D. numbers		
4.	choosing 4 out of 12 possible pizza toppings		

Remember What You Learned

5. To help you remember how the terms *permutation* and *combination* are different, think of everyday words that start with the letters P and C and that illustrate the meaning of each word. Explain how the words illustrate the two terms.

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12-4 Lesson Reading Guide

Probability of Compound Events

Get Ready for the Lesson

Read the introduction to Lesson 12-4 in your textbook.

What is the probability that it will rain in both cities? only in Chicago? Chicago or Los Angeles?

Read the Lesson

1. Complete the chart.

Term	Example	Formula
independent events	Rolling two dice	$P(A \text{ and } B) = P(A) \cdot P(B)$
dependent events		
mutually exclusive events		
inclusive events		

2. In probability, what is meant by the phrase *with replacement*?

Remember What You Learned

3. Look up the following terms in a dictionary. Write the definitions that best relate to the way these terms are used in probability.

independent ____

dependent ____

exclusive ____

inclusive ____

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12-5 Lesson Reading Guide

Probability Distributions

Get Ready for the Lesson

Read the introduction to Lesson 12-5 in your textbook.

- How many customers did the store owner survey?
- Based on the survey, it is most likely that a customer would have _________ pet(s) and least likely that they would have _________ pet(s).

Read the Lesson

The table below shows the probability of various family sizes in the United States.

Family Size (United States)	
X = Size of Family	Probability
2	0.42
3	0.23
4	0.21
5	0.10
6	0.03
7	0.01

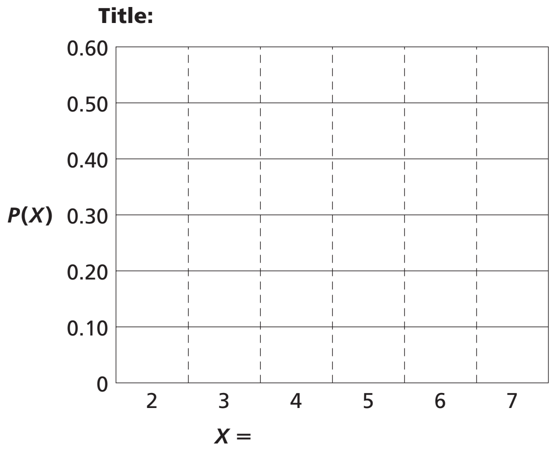
Source: *Statistical Abstract of the United States*

1. For each value of X, is the probability greater than or equal to 0 and less than or equal to 1?

2. What is the sum of the probabilities?

3. Is the probability distribution valid?

4. Complete the probability histogram of the data.



Remember What You Learned

5. Use the outcomes of tossing a coin to describe how the probabilities of the possible outcomes add up to 1.

NAME ____ DATE______________ PERIOD _____

12-6 Lesson Reading Guide

Probability Simulations

Get Ready for the Lesson

Read the introduction to Lesson 12-6 in your textbook.

- What does success mean in this study?

- Since there were 100 people in each study group, what does each number in the chart represent?

Read the Lesson

For each situation described below, choose the manipulative you would use to simulate the problem. Explain your choice.

	Situation	Simulation method
1.	58% of drivers (commercial and private vehicles) have a cell phone in their car. Simulate whether or not the next 10 drivers you meet on the road will have a cell phone.	• die • coins • marbles • spinner
2.	A restaurant has six types of coloring books to give away with children's meals. Simulate finding which coloring books are given away with the next 15 children's meals that are ordered.	• die • coins • marbles • spinner

Remember What You Learned

3. In your own words, explain the difference between theoretical probability and experimental probability.