TOPIC 3

Numeric and Algebraic Expressions

In this topic, students work with numerical expressions that have more than one operation. They then extend that knowledge to work with algebraic expressions, which include at least one variable, or unknown quantity.

CONNECT THE MATH

Algebraic expressions use variables to describe situations in which some of the information is not known.

A local shop sells frames for $2.50 apiece. The total cost of 10 frames can be represented with the numerical expression $10 \bullet \$2.50$, or $25. The total cost for any number of frames can be represented by the algebraic expression $p \bullet \$2.50$. Evaluate the expression $2.5p$ for various values of *p* to find the total cost for any number of frames.

Look for opportunities to model situations with numeric and algebraic situations. Discuss the differences between them and what the variable in the situation represents.

LESSON 3-1

Understand and Represent Exponents

A whole-number exponent can be used to represent repeated multiplication of a number.

LESSON OBJECTIVES

- Write expressions using whole-number exponents to represent real-world and mathematical problems.
- Evaluate expressions with whole-number exponents.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- What Is an Exponent?
- How Do You Evaluate an Exponent?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- base
- exponent

- power

You can use these search terms and phrases to help your student find additional help online:

- representing exponents
- evaluating exponents

LESSON 3-2

Find Greatest Common Factor and Least Common Multiple

Any number can be written as its prime factorization. The greatest common factor (GCF) is the greatest factor that two or more whole numbers have in common. The least common multiple (LCM) is the smallest multiple that two or more nonzero whole numbers have in common.

LESSON OBJECTIVES

- Find the prime factorization of a whole number.
- Find the greatest common factor (GCF) and the least common multiple (LCM) of two whole numbers.
- Use the GCF and the Distributive Property to add.
- Use the GCF and the LCM to solve problems.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- How Do You Find the Greatest Common Factor of Two Numbers Using Prime Factorization?
- How Do You Find the Least Common Multiple by Multiplying Common Factors?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- composite number
- factor tree
- greatest common factor (GCF)
- least common multiple (LCM)
- prime factorization
- prime number

You can use these search terms and phrases to help your student find additional help online:

- finding prime factorization
- using a factor tree
- finding the GCF of two numbers
- GCF and fractions
- finding the LCM of two numbers

LESSON 3-3

Write and Evaluate Numerical Expressions

There is an agreed-upon order in which operations are carried out in a numerical expression.

LESSON OBJECTIVES

- Evaluate expressions using the order of operations.
- Insert grouping symbols in a numerical expression to affect the value of the expression.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- What's the Order of Operations?
- How Do You Use the Order of Operations?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- numerical expression

You can use these search terms and phrases to help your student find additional help online:

- using the order of operations
- expressions with exponents
- expressions with parentheses

LESSON 3-4

Write Algebraic Expressions

Algebraic expressions use variables to describe situations in which some of the information is not known. Parts of expressions can be described using words such as *term*, *coefficient*, *product*, and *factor*.

LESSON OBJECTIVES

- Write an algebraic expression to model a pattern.
- Write an algebraic expression from a word phrase.
- Use precise mathematical language when identifying parts of an expression.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- How Do You Turn a Simple Verbal Phrase into an Algebraic Expression?
- What's a Term?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- algebraic expression
- coefficient
- term
- variable

You can use these search terms and phrases to help your student find additional help online:

- writing an algebraic expression
- identifying parts of an expression

LESSON 3-5

Evaluate Algebraic Expressions

The value of an algebraic expression can be found by replacing the variables with given numbers and doing the calculation that results.

LESSON OBJECTIVES

- Evaluate algebraic expressions, including those with whole numbers, decimals,

and fractions.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- How Do You Evaluate an Algebraic Expression with One Variable?
- How Do You Evaluate an Algebraic Expression with Two Variables?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- substitution

You can use these search terms and phrases to help your student find additional help online:

- evaluating algebraic expressions with one variable
- evaluating algebraic expressions with more than one variable
- evaluating algebraic expressions with exponents

LESSON 3-6

Generate Equivalent Expressions

The Distributive Property and other properties of operations are used to identify and write equivalent expressions.

LESSON OBJECTIVES

- Write equivalent algebraic expressions.

- Identify equivalent algebraic expressions.
- Justify whether two expressions are equivalent.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- What Are the Associative Properties of Addition and Multiplication?
- What Is the Distributive Property?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- equivalent expressions

You can use these search terms and phrases to help your student find additional help online:

- using properties of operations
- identifying equivalent expressions

LESSON 3-7

Simplify Algebraic Expressions

Algebraic expressions can be simplified using the properties of operations to combine like terms and generate equivalent expressions.

LESSON OBJECTIVES

- Use properties of operations to simplify algebraic expressions by combining like terms.

HOW CAN YOU HELP WITH HOMEWORK

Review Lesson Content

Watch and share these video tutorials with your student:

- What Are the Identity Properties of Addition and Multiplication?
- What Is the Distributive Property?

Review Key Vocabulary

Review key vocabulary from this lesson in your student's glossary:

- like terms
- simplify

You can use these search terms and phrases to help your student find additional help online:

- combining like terms
- simplifying algebraic expressions