EUREKA MATH™ TIPS FOR PARENTS

KEY CONCEPT OVERVIEW

In the first topic of Module 3, students extend their knowledge of different properties by writing **equivalent expressions** with variables (e.g., $2(x + 4)$ and $2x + 8$). As they expand their knowledge of the commutative, associative, and **distributive properties**, students can collect (combine) **like terms** in order to write equivalent expressions. Through **rectangular arrays**, students develop an understanding of how the distributive property works both forward and backward. Near the end of the topic, students use their knowledge of these properties, along with their knowledge of **opposites**, to write equivalent expressions with rational numbers. This entire topic prepares students for solving equations in Topic B.

You can expect to see homework that asks your child to do the following:

- Write equivalent **expressions in standard form** by combining like terms and using the commutative, associative, and distributive properties.

- Evaluate **expressions** to verify that they are equal when given a value for the variable(s).

- Translate word problems to equations.

- Use the greatest common factor to write expressions as a product of two factors. For example, $72y + 8$ can be written as $8(9y + 1)$ where 8 and $9y + 1$ are the two factors.

SAMPLE PROBLEMS *(From Lessons 4–5)*

Rewrite $5a - (a - 3b)$ in standard form. Justify each step, applying the rules of subtraction and the distributive property.

$5a + (-(a + (-3b)))$	*Subtraction as adding the inverse*
$5a + (-1)(a + (-3b))$	*The opposite of a number is equivalent to multiplying by -1.*
$5a + (-1)(a) + (-1)(-3b)$	*Distributive property*
$5a + (-a) + 3b$	*Multiplying by -1 is equivalent to the opposite of the number.*
$(5 - 1)a + 3b$	*Distributive property*
$4a + 3b$	*Collect like terms.*

Write the sum of the opposite of $(-7 - 4v)$ and $-4v$ as an expression. Then, write an equivalent expression by collecting like terms and removing parentheses whenever possible.

$-(-7 - 4v) + (-4v)$	
$-1(-7 - 4v) + (-4v)$	*The opposite of a number is equivalent to multiplying by -1.*
$7 + 4v + (-4v)$	*Distributive property*
$7 + 0$	*Associative property, additive inverse*
7	*Additive identity property of zero*

Additional sample problems with detailed answer steps are found in the *Eureka Math Homework Helpers* books. Learn more at GreatMinds.org.

HOW YOU CAN HELP AT HOME

You can help at home in many ways. Here are some tips to help you get started.

- Present your child with an expression (e.g., $2(3x - 4) + 6$), and ask your child to write an equivalent expression in standard form ($6x - 2$). As your child works, encourage an explanation for each step. (Refer to the Sample Problems.) Once the expression is written in standard form, ask your child to prove equivalence by providing a value (number) for the variable (x). Both expressions should evaluate to the same value (i.e., when you replace the variable with the given number, each expression should equal the same number).

- In preparation for Topic B, play an equation game. State a simple equation (e.g., $x + 4 = 8$ or $2x = -10$), and ask your child to state the solution. Remind your child that the solution of an equation is the value that makes it a true **number sentence**. For example, 4 is the solution for $x + 4 = 8$ because $4 + 4 = 8$, and -5 is the solution for $2x = -10$ because $2(-5) = -10$.

TERMS

Coefficient: A constant factor (not to be confused with a *constant*) in a variable term. For example, in the term $4m$, 4 is the coefficient, and it is multiplied by the variable, m.

Distributive property: Allows the numbers in a multiplication problem to be distributed into partial products (i.e., partial answers). The partial products can then be added together to find the product, or the answer to the original multiplication problem. For example, $3(x + 7) = (3x) + (3 \cdot 7) = 3x + 21$.

Equivalent expressions: Expressions that have the same value. For example, 2×6 and $4a$ (when $a = 3$) are equivalent expressions.

Expression: A group of numbers, symbols, and operators (e.g., $+$ and $-$) with no equal sign that represents a single value. For example, 2×4 and $9(x + 1)$ are expressions.

Expression in standard form: An expression where all like terms are collected. For example, $2x + 3x + 5$ is an expression; however, to write it in standard form, you must combine the like terms $2x$ and $3x$. The equivalent expression $5x + 5$ is written in standard form.

Like terms: Terms that have the same variable to the same power. For example, $3x$ and $-8x$ are like terms because they both have a variable of x and a common power of 1. However, $3x$ and $-8y$ are not like terms because they do not have the same variable.

Number sentence: A statement indicating that two numerical expressions are equal (e.g., $8 - 2 + 2 = 8$).

Opposites: Numbers that are the same distance from zero on the number line but on different sides of zero (e.g., -3 and 3).

Term: Part of an expression that can be added to or subtracted from the rest of the expression. In the expression $7g + 8h + 3$, the terms are $7g$, $8h$, and 3.

MODELS

Rectangular Array

	$12d$	$4e$	3
2	$24d$	$8e$	6