Date _____

Dear Family,

In this chapter, your child will write and evaluate algebraic expressions, operate with positive and negative numbers, simplify expressions, and graph points in the coordinate plane.

Students will translate words into **algebraic expressions**.

Verbal Expression	Algebraic Expression
Sam is **2** years **younger** than Sue, who is ***y*** years old. Write an algebraic expression for Sam's age.	$y - 2$ *"younger" means "less than"*

They will **evaluate** algebraic expressions by substituting values for the variables.

Evaluate $y - 2$ for $y = 18$.

$y - 2 = 18 - 2$ *Substitute 18 for y.*

$= 16$ *Subtract.*

These rules summarize how to operate with signed numbers.

Adding with the Same Sign Add the absolute values of the numbers and use the same sign as the numbers.	$-4 + (-12) = -16$ *Think: 4 + 12 = 16 and the result is negative because both numbers are negative.*
Adding with Different Signs Find the difference of the numbers' absolute values and use the sign of the number with the greater absolute value.	$3 + (-8) = -5$ *Think: 8 − 3 = 5 and the result is negative because –8 has the greater absolute value.*
Subtracting Add the opposite of the second number.	$5 - (-4) = 5 + 4 = 9$ *Think: To subtract −4, add +4.*
Multiplying or Dividing with the Same Sign The result is positive.	$-4 \cdot (-5) = 20$ *Think: Same signs make positive.*
Multiplying or Dividing with Different Signs The result is negative.	$42 \div (-7) = -6$ *Think: Different signs make negative.*

The expression 6^3 is called a **power**. $6^3 = 6 \cdot 6 \cdot 6 = 216$.

Students will study both positive and negative **square roots**.

$\sqrt{25} = 5$ because $5^2 = 25$.

$-\sqrt{49} = -7$ because $(-7)^2 = 49$.

Some square roots are equal to decimals that never end and never repeat. These numbers are irrational and belong to one of the classifications of the real numbers.

Real Numbers	
Natural Numbers	Counting numbers: 1, 2, 3, …
Whole Numbers	Natural numbers and zero: 0, 1, 2, 3, …
Integers	Whole numbers and their opposites: …, –3, –2, –1, 0, 1, 2, 3, …
Rational Numbers	Numbers that can be expressed as a ratio (fraction) of two integers. Includes all numbers whose decimal forms are either **terminating decimals** (4, 2.5) or **repeating decimals** (0.33…).
Irrational Numbers	Numbers that cannot be expressed as a ratio of two integers. Includes numbers whose decimal forms never terminate and never repeat, such as π and $\sqrt{2}$.

If an expression contains more than one operation, the **order of operations** dictates which operation to do first. Students can remember the order by **P**lease **E**xcuse **M**y **D**ear **A**unt **S**ally.

Evaluate $4^2 \cdot 6 - (2 + 3)$.

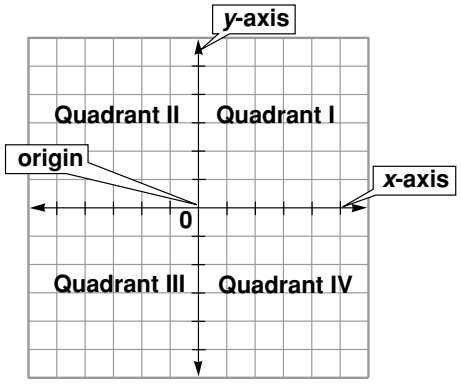
$4^2 \cdot 6 - (2 + 3) = 4^2 \cdot 6 - (5)$	**P**arentheses and all grouping symbols
$= 16 \cdot 6 - (5)$	**E**xponents
$= 96 - 5$	**M**ultiplication and **D**ivision (left to right)
$= 91$	**A**ddition and **S**ubtraction (left to right)

The Commutative, Associative, and Distributive Properties are valid for all real numbers and will help students simplify expressions.

Commutative Property (ordering)	$a + b = b + a$	$ab = ba$
Associative Property (grouping)	$(a + b) + c = a + (b + c)$	$(ab)c = a(bc)$
Distributive Property (multiplying across addition)	$a(b + c) = ab + ac$	

$10x^2$ and $-8x^2$ are **terms**—the parts of an expression that are separated by $+$ or $-$ signs. **Like terms** can be combined: $10x^2 - 8x^2 = 2x^2$.

The **coordinate plane** is defined by two perpendicular axes intersecting at the origin. An **ordered pair** (x, y) can be graphed by moving left or right from the origin according to the ***x*-coordinate**, and then up or down according to the ***y*-coordinate**.



Students will graph functions such as $y = x^2 - 5$ by generating ordered pairs. Ordered pairs are generated by picking a value for x (input), substituting it into the function, and then finding the value of y (output).

For additional resources, visit go.hrw.com and enter the keyword MA7 Parent.