Unit 6 Family Support Materials

Get acquainted with the topics and concepts your student will be learning during Unit 6.

Working with Polynomials

In this unit, your student will learn that a monomial is an algebraic expression with exactly one term. A polynomial is a monomial (one term) or a combination of monomials (two or more terms). When there is more than one monomial term, the terms are separated by addition or subtraction.You can classify a polynomial by the number of terms and by the degree, which is the value of the highest power of the variable of its individual terms.

Classifying polynomials by the *number of terms* and *degree of the polynomial*

	Monomial	Binomial	Trinomial
Example	$5x^2$	$4x + 6y$	$3x^2 + 8y^3 - z$
Term (s)	Exactly 1	Exactly 2	Exactly 3
Highest power of the variable	2	1	3

Adding or subtracting polynomials by combining *like terms*
"Like terms" are monomials that contain matching variables that have the same exponent.

1. $(3k^2 + 6k + 2) + (9k^2 - 7k - 4)$

   STEP 1: Use commutative property to rearrange like terms, then use associative property to regroup.

   $(3k^2 + 9k^2) + (6k - 7k) + (2 - 4)$

   STEP 2: Combine like terms.

   $12k^2 - k - 2$

2. $(3x^2 + 7xy - 3y^2) - (5x^2 - 4y^2)$

   STEP 1: Use distributive property to remove parentheses from subtracted terms.

   $(3x^2 + 7xy - 3y^2) - 5x^2 + 4y^2$

   STEP 2: Use commutative property to rearrange like terms, then use associative property to regroup.

   $(3x^2 - 5x^2) + 7xy + (-3y^2 + 4y^2)$

   STEP 3: Combine like terms.

   $-2x^2 + 7xy + y^2$

Multiplying Polynomials by using the *distributive property*
The "distributive property" multiplies a factor to every term contained within parentheses.

1. $2(p + 6)$

   STEP 1: Use the distributive property to multiply 2 by each term in parentheses.

   $2p + 2 \bullet 6$

   STEP 2: Multiply.

   $2p + 12$

2. $6x(x - 5)$

   STEP 1: Use the distributive property to multiply 6x by each term in parentheses.

   $6x \bullet x - 6x \bullet 5$

   STEP 2: Use the commutative property to rearrange factors.

   $6x \bullet x - 6 \bullet 5 \bullet x$

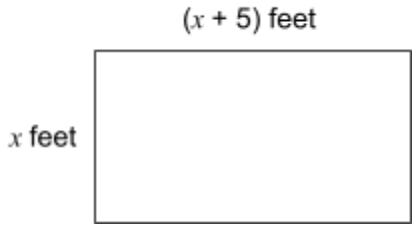
   STEP 3: Multiply. Use the property of exponents to multiply $x^1 \bullet x^1 = x^2$.

   $6x^2 - 30x$

Apply

Try this task with your student

A rectangular garden plot has a length that can be expressed as $x + 5$ feet and a width expressed as x feet.



Complete the following questions

1. Write a polynomial expression to represent the perimeter of the garden.

2. Write a polynomial expression to represent the area of the garden.

3. What is the perimeter if $x = 15$?

4. What is the area if $x = 15$?

**You can find the answers on the next page*

Hide the answers until you have attempted the questions

1. The perimeter of a rectangle equals the sum of its side lengths, $2 \bullet length + 2 \bullet width$.
   STEP 1: Substitute the length and width into the expression for perimeter.
   $2(x + 5) + 2(x)$
   STEP 2: Use the distributive property to multiply by each term in parentheses.
   $2 \bullet x + 2 \bullet 5 + 2(x)$
   STEP 3: Multiply.
   $2x + 10 + 2x$
   STEP 4: Use the commutative property to gather like terms and combine them.
   $2x + 2x + 10$
   $4x + 10$
   STEP 5: Write out your answer. The perimeter is $4x + 10$ feet.

2. The area of a rectangle is length times width, $length \bullet width$.
   STEP 1: Substitute the length and width into the expression for area.
   $(x + 5)(x)$
   STEP 2: Use the distributive property to multiply by each term in parentheses.
   $(x \bullet x) + (5 \bullet x)$
   STEP 3: Multiply.
   $x^2 + 5x$
   STEP 4: Write out your answer (there are no like terms to combine). The area is $x^2 + 5x$ square feet.

3. The expression for perimeter is $4x + 10$.
   STEP 1: Substitute 15 for x into the expression for perimeter.
   $4(15) + 10$
   STEP 2: Multiply.
   $60 + 10$
   STEP 3: Add.
   70
   STEP 4: Write out your answer. The perimeter is 70 feet.

4. The expression for area is $x^2 + 5x$.
   STEP 1: Substitute 15 for x into the expression for area.
   $(15)^2 + 5(15)$
   STEP 2: Evaluate the exponent and multiply.
   $225 + 75$
   STEP 3: Add.
   300
   STEP 4: Write out your answer. The area is 300 square feet.

Review

Here are the video lesson summaries for Unit 6: Working with Polynomials.
Each video highlights key concepts and vocabulary that students learn across each lesson in the unit. The goal of these videos is to support students in reviewing and checking their understanding of important concepts and vocabulary. Here are some possible ways families can use these videos:

Here are some possible ways families can use these videos:

- Keep informed on concepts and vocabulary students are learning about in class.
- Watch with their students and pause at key points to predict what comes next or think up other examples of vocabulary terms

Video Title	Related Lessons
Adding Polynomials	• Add and Subtract Polynomials
Subtracting Polynomials	• Add and Subtract Polynomials
Multiplying Monomials	• Multiplying Polynomials
Multiplying Monomials by Polynomials	• Multiplying Polynomials
Multiplying Binomials	• Multiplying Polynomials
Dividing Polynomials: Long Division	• Dividing Polynomials
Taking Common Factor from Trinomial	• Greatest Common Factor and Factor by Grouping • Factor Trinomials
Factoring Quadratics: Common Factor + Grouping	• Greatest Common Factor and Factor by Grouping
Factoring Quadratics as (x+a)(x+b)	• Factor Trinomials • General Strategy for Factoring Polynomials
Factoring Perfect Squares	• Factor Special Products
Difference of Squares Intro	• Factor Special Products

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