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Multiplying and Factoring

Unit 8 Lesson 2

Multiplying and Factoring

Students will be able to:

Factor and perform multiplication of Polynomials

Key Vocabulary:

- Factoring
- Greatest Common Factor
- Multiplication
- Monomials
- Polynomials

Multiplication of Algebraic Expression:

Monomials by Monomial. to multiply monomials, use the commutative and associative rules for multiplication and in most cases, the theorem of exponents.

Monomial by a Polynomial. if a polynomial is to be multiplied by a monomial, the distributive rule is used. The product is the sum of all the products formed by multiplying each term polynomial by the monomial multiplier.



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Sample Problem 1: Find the product of the following monomials

1. $(3x^2y)(4xy^3)$

2. $(xy^2z^3)(2xy^5)$

3. $(3a)(21b^2c)$

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Sample Problem 1: Find the product of the following monomials

$$1.(3x^2y)(4xy^3)$$

$$12x^3y^4$$

$$2.(xy^2z^3)(2xy^5)$$

$$2x^2y^7z^3$$

$$3.(3a)(21b^2c)$$

$$63ab^2c$$

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Sample Problem 2: Find the product of the monomial by polynomials

$$4.3x(4x + 2)$$

$$5.3a(2a^2 + 4b)$$

$$6.5x(x^2 + 3x - 4)$$

$$7.6ab(2a + 3b - 4c + 5)$$

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Sample Problem 2: Find the product of the monomial by polynomials

$$4.3x(4x + 2)$$

$$12x^2 + 6x$$

$$5.3a(2a^2 + 4b)$$

$$6a^3 + 12ab$$

$$6.5x(x^2 + 3x - 4)$$

$$5x^3 + 15x^2 - 20x$$

$$7.6ab(2a + 3b - 4c + 5)$$

$$12a^2b + 18ab^2 - 24abc + 30ab$$

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Factoring:

Factoring Polynomials is simply the reverse process of special product.

A polynomial with integral coefficient is no longer factorable if:

1. the coefficient have no common factor, and
2. it cannot be expressed as the product of two polynomial of lower degree.

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Sample Problem 3: Factor the following polynomials

$$8.24x^2 - 18x^3$$

$$9.60ab^5 - 105a^2b^4$$

$$10.28a^2b^4c^5 - 42a^3b^2c^4 + 56ab^3c^3$$

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Sample Problem 3: Factor the following polynomials

$$8.24x^2 - 18x^3$$

$$\text{factors : } (4 \times 6)x^2 - (6 \times 3)x^3$$

$$\text{GCF : } 6x^2$$

$$\text{Answer : } 6x^2(4 - 3x)$$

$$9.60ab^5 - 105a^2b^4$$

$$\text{factors : } (2^2 \times 3 \times 5)ab^5 - (3 \times 5 \times 7)a^2b^4$$

$$\text{GCF : } (3 \times 5)ab^4 = 15ab^4$$

$$\text{Answer : } 15ab^4(4b - 7a)$$

$$10.28a^2b^4c^5 - 42a^3b^2c^4 + 56ab^3c^3$$

$$\text{factors : } (2 \times 2 \times 7)a^2b^4c^5 - (2 \times 3 \times 7)a^3b^2c^4 + (2 \times 4 \times 7)ab^3c^3$$

$$\text{GCF : } (2 \times 7)ab^2c^3 = 14ab^2c^3$$

$$\text{Answer : } 14ab^2c^3(2ab^2c^2 - 3a^2c^2 + 4b)$$