**MTH1W – Unit 8: Algebra II**

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**Lesson #8.1: Factoring Expressions with Common Factors**

Date: April 17, 2023

**Learning Goal:** We are learning to Factor expressions that contain common factors.

**Let's look at some needed skills this unit (there are others).**

1) $3x + 4x$

$= 7x$

b) $3x^2 + 4x$

$= 3x^2 + 4x$

2) $(3x)(4x)$

$= 12x^2$

3) $5(2x - 7)$ Expanding

$= 10x - 35$ factoring

4) What is the greatest common factor of 18 and 96?

1, 2, 3, 6, 9, 18

$\frac{96}{18} =$ $\frac{96}{9} =$ $\frac{96}{6} = 16$

GCF is 6

5) What is the common factor of 16, 36 and 64?

16 ⇒ 1, 2, 4, 8, 16

$\frac{36}{4} = 9$ $\frac{64}{4} = 16$

∴ The GCF is 4

**Notes on Common Factoring:** Factoring is the opposite of expanding. Hence, when expanding, that work eliminates brackets. Factoring brings brackets back into the equation. Also, expanding uses multiplication, therefore factoring uses division.

**Factor the common factor out of each expression.**

5) $\frac{8n^2}{2} - \frac{6}{2}$

GCF: 2

Divide 2 into both terms

$= 2(4n^2 - 3)$

6) $\frac{20m^5}{5} + \frac{15}{5}$

GCF: 5

$= 5(4m^5 + 3)$

7) $2p^5 + 5p^4$

GCF: $1p^4$ ← the lowest exponent.

When you divide exponents, subtract.

$= p^4(2p + 5)$

8) $6x^6 + 15x^4$

GCF: $3x^4$

Divide #'s
Subtract exponents

$= 3x^4(2x^2 + 5)$

If the first term is negative, the GCF is negative.

9) $-8v^5 - 30v^2 + 2v$

GCF: $-2v$

$= -2v(4v^4 + 15v - 1)$

10) $8x^4y^2 - 18x^3 + 18x^2y$

GCF: $2x^2$

$= 2x^2(4x^2y^2 - 9x + 9y)$

11) $5x(x - 3) + 8(x - 3)$

GCF: $(x-3)$

$= (x-3)(5x+8)$

$5x \square + 8\square$

12) $3xy(y + 2) - 17w^2(y + 2)$

GCF: $(y+2)$

$= (y+2)(3xy - 17w^2)$

**Success Criteria:**

- I can identify common factors
- I can factor expressions by dividing each term by the common factor
- I can write a factored expression as a monomial × a polynomial