MTH1W – Unit 5: Algebra II

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Lesson #5.1: Factoring Expressions with Common Factors

Date: Thurs, Mar 27.

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

Simplify each expression.

1) $(5r - 1 - 4r^4) + (1 - 7r^3 + 2r^4)$

$= -2r^4 - 7r^3 + 5r$

2) $2n^2(6n - 8)$

$= 12n^3 - 16n^2$

3) $\frac{6x^3y + 3x^2y^3}{3x^2y}$

$= \frac{6x^3y}{3x^2y} + \frac{3x^2y^3}{3x^2y}$

$= 2x + y^2$

4) $5(2y^2 + 3y - 8) - 2y(3y - 4)$

$= 10y^2 + 15y - 40 - 6y^2 + 8y$

$= 4y^2 + 23y - 40$

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.

But before we learn this important skill called '' Factoring'', let's make sure we know what 'Factors' are and how to find the 'Greatest Common Factor'.

List all the factors of 12.

1 x 12
2 x 6
3 x 4

List all the factors of 75

1 x 75
3 x 25
5 x 15

Circle all the common factors in your list. Now, any guesses on what the GCF of 12 and 75 is? 3.

5) What is the GCF of 48 and 42?

$48 = 1 \times 48$
$= 2 \times 24$
$= 3 \times 16$
$= 4 \times 12$
$= 6 \times 8$

$42 = 1 \times 42$
$= 2 \times 21$
$= 3 \times 14$
$= 6 \times 7$

$GCF(48, 42) = 6$

Factor the common factor out of each expression.

6) $8n^2 - 6$

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

7) $20m^5 + 15$

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

8) $2p^5 + 5p^4$

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

9) $3x^6 + x^4$

$= x^4(3x^2 + 1)$

10) $-8uv^5 - 3u^2v - 2uv$

$= -uv(8v^4 + 3u + 2)$

11) $8x^4y^2 - 18x^3y + 18x^2y$

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

12) $5x(x - 3) + 8(x - 3)$

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

13) $3xy(y + 2) - 17w^2(y + 2)$

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

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