MTH1W – Unit 8: Algebra II

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Lesson #8.1: Factoring Expressions with Common Factors

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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) $3x + 4x$

$= 7x$

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

$= 12x^2$

3) $5(2x - 7)$

$= 2x(5) - 7(5)$

$= 10x - 35$

Expand ↓ Factor ↑

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

1, 2, 3, 6, 9, 18

$18 \div 6 = 3$

$96 \div 6 = 16$

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

1, 2, 4, 8, 16

$16 \div 4 = 4$ ✓

$36 \div 4 = 9$ ✓

$64 \div 4 = 16$ ✓

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 every term by 2.

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

6) $20m^5 + 15$ GCF = 5

$= 5(4m^5) + 5(3)$ Factor out the 5.

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

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

GCF = $1p^4$ → take them away → subtract the exponents

$= p^4(2p^1 + 5)$

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

GCF: $3x^4$ — always the smaller exponent!

Divide.

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

If the first number is negative, make the GCF negative

9) $-8v^5 - 30v^2 + 2v^1$

GCF: $-2v$

$\div -2$ take away a v

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

Math people like the front in a bracket to be positive.

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

GCF = $2x^2$

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

$5x\square + 8\square$

$= \square(5x + 8)$

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

GCF: $(x-3)$

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

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