Math 9 – Unit 5: Algebra II

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Lesson #1: Factoring Expressions with Common Factors

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

Simplify each expression.

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

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

Expanding

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

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

→ add exponents when multiplying

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

→ subtract exponents when dividing

$= 2x + y^2$

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

① Expand ② simplify

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

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

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.

Factor the greatest common factor out of each expression.

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

GCF = 2

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

6) $20m^5 + 15$

GCF = 5

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

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

GCF = p^4

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

8) $3x^6 + x^4$

GCF = x^4

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

Leading coefficient → if negative, make GCF negative

9) $-8uv^5 - 3u^2v - 2uv$

GCF: $-1uv$ or $-uv$

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

↳ This term needs to be positive.

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

GCF = $2x^2y$

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

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

GCF is $(x-3)$

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

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

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

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