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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.
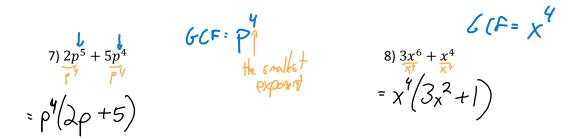
Simplify each expression.

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

$= -2r^3 - 2r^4$

$= -2r^4 - 2r^3$

multiply → distributive property

→ add exponents when multiplying

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

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

3) $\dfrac{6x^3y + 3x^2y^3}{3x^2y} \div$ *subtract exponents when dividing*

$= 2x^1 + y^2$

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.*___.

Factor the common factor out of each expression.

5) $\dfrac{8n^2}{2} - \dfrac{6}{2}$ GCF: 2 → *divide from each term*

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

GCF = 5

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

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

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

the smallest exponent

$\downarrow$ $\downarrow$

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

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

$\dfrac{3x^6}{x^4} \quad \dfrac{x^4}{x^4}$

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

when you start with a negative, make the GCF negative

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

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

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

$\dfrac{4x^2}{} \quad \dfrac{9x}{} \quad \dfrac{9x^2}{}$

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

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

$(x-3) \quad (x-3)$

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

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