

Lesson #1. Factoring Expressions With Common Factors

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Simplify each expression.

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

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

2) $(8p + 6 + 8p^3) - (7p^3 - 6 + 3p)$

$$= p^3 + 5p + 12$$

$(6 - (-6) = 6 + 6)$

3) $2n^2(6n - 8)$

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

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 expression. Also, expanding uses multiplication, therefore factoring uses division.

Factor the common factor out of each expression.

5) $8n^2 - 6$

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

"what can you divide into 8 and 6?"

Divide each term by 2.

6) $20m^5 + 15$

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

$$\frac{x^{10}}{x^8} = x^2$$

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

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

① Look at the #'s

② Factor out the smallest exponent.

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

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

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

*Starts with a negative
∴ divide by
a negative*

$$= -1uv(8v^4 + 3u + 2)$$

must be positive

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

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

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

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

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

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