Name: _____ Date: _____

# GCF Factoring

Introduction to Factoring out GCF

★"Factor" simply means to **UN**DISTRIBUTE.★

| Distributed Version | Factored Version |
|---|---|
| $5x^2 + 15x$ | $5x(x + 3)$ |
| $2x^3 - 8x^2$ | $2x^2(x - 4)$ |
| $2x^2 - 4x$ | $2x(x - 2)$ |
| $15x^2 - 5x + 30$ | $5(3x^2 - x + 6)$ |

More formal Definition:

◎ ***Factoring***: *Writing the polynomial as a product*.

## Steps to Factoring Out a GCF:

- ★ Find the GCF of all its terms (number and/or variables). For variables ALL the terms must have the variable. *Choose the smallest exponent!*
- ★ The GCF goes to the LEFT!
- ★ Write the polynomial as a product by *dividing* the original terms of the polynomial by the GCF.
- ★ The remaining factors in each term will form a polynomial. You'll always have the same number of terms you started with.

**Factor using a GCF:**

◎ $4x + 6y$

$2(2x + 3y)$

◎ $6x^3 - 9x^2 + 12x$

$3x(2x^2 - 3x + 4)$

◎ $y^8 - y^5 + y^2$

$y^2(y^6 - y^3 + 1)$

**PRACTICE: Factor each polynomial using a GCF.**

1. $10x + 45$

2. $28x - 63$

3. $18a + 42$

4. $8x + 24$

5. $18x^2 - 15x + 39$

6. $27a^2 + 81$

7. $72a^8 + 33a^5 - 42a^3$

8. $15x^7 + 30x^6 - 45x^3$

9. $4x^3 + 16x^2 - 44$

10. $14x^2 + 7x - 42$