greatest common Factor

GCF: the biggest # that 2 numbers have in common

8 & 10:
- 8 = 1, (2), 4, 8
- 10 = 1, (2), 5, 10

GCF: 2

30 & 45:
- 30 = 1, 2, 3, 5, 6, 10, (15), 30
- 45 = 1, 3, 5, 9, (15), 45

GCF: 15

* The GCF with variables is the SMALLEST amount they both have *

x^2 & x^4:
- x^2 = (x · x)
- x^4 = (x · x) x · x

GCF: x^2

y & y^3:
- y = y
- y^3 = y · y · y

GCF = y

a^2b^3 & ab^2:

GCF = ab^2

Factoring Polynomials by GCF

Name: _____ Date: _____

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

Distributed Version	Factored Version
$5x^2+15x$	$5x(x+3)$
$2x^3-8x^2$	$2x^2(x-4)$
$2x^2-4x$	$2x(1x-2)$
$15x^2-5x+30$	$5(3x^2-1x+6)$

More formal Definition:

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

Steps to Factoring Out a GCF:

1. Find the GCF of all its terms (number and/or variables).
2. Write the polynomial as a product by *factoring out* the GCF from all the terms. monomial → GCF (Factor "leftovers") Polynomial
   - This is done by *dividing* the original terms of the polynomial by the GCF.
3. The remaining factors in each term will form a polynomial.

* "leftover" polynomial should have same # of terms as original problem

Examples as a class:

◎ $4x+6y$

$2(2x+3y)$

◎ $6x^3-9x^2+12x$

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

◎ $10c^2d^2-15cd^3$

$5cd^2(2c-3d)$

@ $6x^2yz+2xy^2z-4xyz$

$2xyz(3x+y-2)$

Try the following.

1. $8x - 12y$

$4(2x-3y)$

2. $14a^3 + 2a^2 - 14a$

$14a(14a^2+2a-1)$

3. $14mn - 7m^2n + 21mn^2$

$7mn(2-m+3n)$

4. $3x - 9x^2$

$3x(1-3x)$