

Math 060 WORKSHEET
7.1 Factoring Out the Greatest Common Factor and
Factoring by Grouping

NAME: _____

Last chapter we multiplied expressions. In this chapter we reverse the process and ask ourselves what factors make a certain product:

Multiplication Process:

Given Factors, find the product

$$3x(4x - 2y) = 12x^2 - 6xy$$

$$(x + 2)(x - 4) = x^2 - 2x - 8$$

Factoring Process:

Given the product, find the factors

$$12x^2 - 6xy = 3x(4x - 2y)$$

$$x^2 - 2x - 8 = (x + 2)(x - 4)$$

FACTORING

Factoring is the process of writing an expression as a product.

Example: Find the prime factorization of 360 (A factorization of 360 using only prime numbers)

GREATEST COMMON FACTOR (GCF)

The greatest common factor of two or more expressions is the largest (most factors) that is common to all the expressions. To find this, list each common factor and take the product.

Example: Find the greatest common factor of each group

a.) 66, 78, 120

b.) $40a^2b$, $72ab^2$, $16b^3$

c.) $14a$, $33b$, $13c$

FACTORING OUT THE GREATEST COMMON FACTOR

We are interested in common factors because we can use the distributive property to factor them out.

For example: $(12x^3z + 3xy) = (3x \cdot 4x^2z + 3x \cdot y) = 3x(4x^2z + y)$

Example: Factor each expression by factoring out the greatest common monomial factor

a.) $15x^7 + 5x^5$

b.) $8a^2b^2 - 4a^2b + a^2$

c.) $16a^2b^2c^2 + 32a^2bc^2 + 24a^2bc$

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