

## Greatest Common Factor; Factoring by Grouping

The greatest number that divides all given numbers with no remainder is called the

\_\_\_\_\_.

ex: The GCF of 32, 40, and 24 is 8. Why? Since 32, 40, and 24 are divisible by 8, and 8 is the greatest such number.

**Ex 1.**

Find the GCF of 36 and 54.

**Ex 2.**

Find the GCF of 60 and 77.

**Ex 3.**

Find the GCF of  $24x^5$ ,  $16x^4$ , and  $48x^3$ .

\_\_\_\_\_ is the reverse process of multiplication.

Multiplication:  $3 \cdot 5 = 15$

Factoring:  $15 = 3 \cdot 5$

Multiplication:  $3x(2x + 5) = 6x^2 + 15x$

Factoring:  $6x^2 + 15x = 3x(2x + 5)$

### Greatest Common Factor (GCF)

**GCF of a polynomial:** \_\_\_\_\_ of the coefficients times each variable to the \_\_\_\_\_ power.

ex: What is the GCF of  $6x^2 + 15x$ ? \_\_\_\_\_

**Ex 4.**

Factor:  $18x^3y^2 - 27xy^3$

**Ex 5.**

Factor:  $3x^2y + 6x^4y^2 - 12x^3y^6$

**Ex 6.**

Factor:  $-4x^3 + 12x^2 + 8x$

### Factoring by Grouping

**Ex 7.**

Factor:  $2(x - 3) + 7a(x - 3)$

**Ex 8.**

Factor by grouping:  $x^3 - 4x^2 + 5x - 20$

**Factoring by grouping:**

1. \_\_\_\_\_ terms that have common monomial factor.
2. \_\_\_\_\_ common monomial factor from each group.
3. \_\_\_\_\_ remaining common binomial factor.

**Ex 9.**

Factor by grouping:  $3x^3 - 2x^2 - 6x + 4$

**Note:** Sometimes need to rearrange terms to get method to work.

**Ex 10.**

Factor by grouping:  $3x^2 - 8y + 12x - 2xy$

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**Practice**

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1. Factor:  $9x^4 + 18x^3 + 6x^2$
  2. Factor:  $15x^4y^6 - 3x^3y^5 + 12x^4y^4$
  3. Factor:  $-5x^3 + 50x^2 - 10x$
  4. Factor:  $4y(a - b) - (a - b)$
  5. Factor by grouping:  $x^3 - 2x^2 + 5x - 10$
  6. Factor by grouping:  $xy - 5x + 9y - 45$
  7. Factor by grouping:  $2x^3 - 10 + 4x^2 - 5x$
- Q: What is the word that everybody always says wrong?