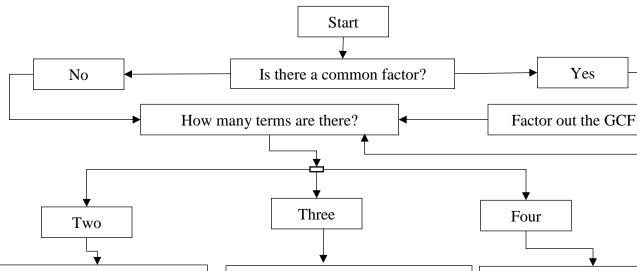
# **Learning Resource Center - Math Center**

## **Factoring Flowchart**



#### Is it a Difference of Squares? $A^2 - B^2 = (A - B)(A + B)$

Examples:

$$x^{2} - 25 = (x - 5)(x + 5)$$
$$9x^{2} - 64 = (3x - 8)(3x + 8)$$

#### **Factor into two Binomials**

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Examples:

$$x^{2} - 4x - 21 = (x - 7)(x + 3)$$
$$10x^{2} - 11x - 3 = (2x - 1)(5x + 3)$$

#### **Factor by Grouping**

Example: 
$$6ab + 2b + 9a + 3$$
  
=  $(6ab + 2b) + (9a + 3)$   
=  $2b(3a + 1) + 3(3a + 1)$   
=  $(3a + 1) + (2b + 3)$ 

## **By Difference of Squares**

Example:  $x^2 - 10x + 25 - y^2$ 

$$\underbrace{x^2 - 10x + 25} - y^2$$

$$= (x-5)^2 - y^2$$
  
=  $(x-5-y)(x-5+y)$ 

Example: 
$$x^2 - y^2 + 6y - 9$$

$$= x^{2} - (y^{2} - 6y + 9)$$

$$= x^{2} - (y - 3)^{2}$$

$$= (x - y + 3)(x + y - 3)$$

## Is it a Difference of Cubes?

$$A^3 - B^3 = (A - B)(A^2 + AB + B^2)$$

Examples:

$$x^3 - 27 = (x - 3)(x^2 + 3x + 9)$$
  
8x<sup>3</sup> - 125 = (2x - 5)(4x<sup>2</sup> + 10x + 25)

## Is it a Sum of Cubes?

$$A^3 + B^3 = (A + B)(A^2 - AB + B^2)$$

Examples:

$$x^3 + 64 = (x+4)(x^2 - 4x + 16)$$
$$125x^3 + 1 = (5x+1)(25x^2 - 5x + 1)$$

#### Check each factor. Can it be factored again?

If the answer is **YES**, repeat the process

If the answer is **NO**, write the final answer as a product of all the factors and the GCF