

Factoring Types:

Remove Common Factor (GCF)

2 TERMS

Difference of Squares

$$a^2 - b^2 \\ = (a+b)(a-b)$$

Difference of Cubes

$$a^3 - b^3 \\ = (a-b)(a^2 + ab + b^2)$$

Sum of Cubes

$$a^3 + b^3 \\ = (a+b)(a^2 - ab + b^2)$$

3 TERMS

M & N Method

$$x^2 + Bx + C$$

OR

$$Ax^2 + Bx + C$$

where

$$(m)(n) = AC \\ m+n = B$$

Example: 1

$$x^2 - 5x + 6 \\ (x-3)(x+2)$$

Example: 2

$$5x^2 + x - 6 \\ A=5 \quad B=1 \quad C=-6$$

$$\text{Let } m = -5 \\ n = 6$$

$$(m)(n) = -30 \quad (A)(C)$$

$$\text{and } m+n = 1 \quad (B)$$

$$5x^2 + x - 6$$

$$\begin{array}{c} \swarrow \quad \searrow \\ 5x^2 - 5x + 6x - 6 \end{array}$$

$$5x(x-1) + 6(x-1)$$

$$(x-1)(5x+6)$$

4 TERMS

Group to Get GCF

$$ax + ay + bx + by \\ = a(x+y) + b(x+y) \\ = (x+y)(a+b)$$

Group to Get Difference of Squares

Example:

$$\underbrace{x^2 + 6x + 9}_{(x+3)(x+3)} - y^2 \\ (x+3)^2 - y^2 \\ (x+3+y)(x+3-y)$$