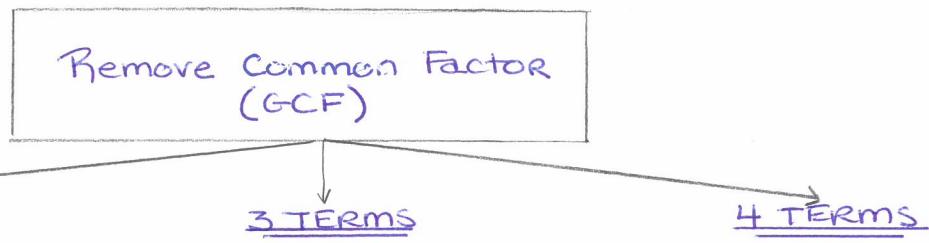


# Factoring Types:



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

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

$m \in N$  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

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

$$A=5 \quad B=1 \quad C=-6$$

Let  $m = -5$

$n = 6$

$$(m)(n) = -30$$

and

$$m+n = 1$$

(B)

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

$\swarrow \quad \searrow$

$$\underbrace{5x^2 - 5x}_{5x(x-1)} + \underbrace{6x - 6}_{6(x-1)}$$

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

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:

$$\overbrace{x^2 + 6x + 9} - y^2$$

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

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

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

## Review Questions: Factoring

### ① Common Factor

a)  $8x - 16$       b)  $7m^5 + 7m^6$       c)  $6m^4 + 21m^3 + 15m^2$

d)  $9(x+5) + 3(x-3)(x+5)$       e)  $(x-6)^2 + (x-6)$

### ② Grouping

a)  $3x+6 + xy + 2y$

b)  $10x - 2ay + 2a - 10y$

c)  $9y - x^2y^2 - 9w + x^2wy$

### ③ Factoring Trinomials

a)  $x^2 - 10x + 24$       b)  $x^2 + 22x + 121$       c)  $-4x - x^2 - 3$

d)  $x^2 - 2xy + y^2$       e)  $20x^2 - 21x - 5$       f)  $48x^2 + 8x - 96$

④ Difference of Squares

a)  $x^2 - 4$

b)  $2x^2 - 2y^2$

c)  $4x^2 - 9$

d)  $(a+b)^2 - c^2$

e)  $x^2 - (y+z)^2$

f)  $x^2 + 6x + 9 - y^2$

g)  $m^2 - n^2 + 2n - 1$

⑤ Difference of Cubes / Sum of Cubes

a)  $x^3 - 8$

b)  $8x^3 - 27$

c)  $2 - 2n^3 b^3$

d)  $(x+2)^3 - y^3$

e)  $x^{36} + 1$

f)  $27m^3 - 64$